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Teacher Knowledge and Use of Universal Design for Learning

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TEACHER KNOWLEDGE AND USE OF UNIVERSAL DESIGN FOR LEARNING

By

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Prepared in partial fulfillment for the requirements of the Masters of Arts Degree in

Multicategorical Special Education

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Abstract

Today's classrooms are composed with a wide variety of students. It is important for all teachers, both special and general education, to have the ability to teach a diverse group of students. In recent years, Universal Design for Learning (UDL) has gained a positive reputation as a scientifically validated teaching method that considers individuality. The purpose of this investigation is to assess teachers on their knowledge and use of UDL. A small pool of licensed teachers in the Chicago metropolitan area were polled by means of an electronically disbursed, anonymous survey. The results show 55% of participants claim to be familiar with UDL and 55% of teachers claim to use UDL in their classroom regularly. The data also shows that all the participants are currently, regularly using strategies that The Center for Applied Special Technology (CAST) calls the guidelines for UDL.

Key words: Universal Design for Learning, general education, special education, survey design

Chapter 1

Introduction

Special educators have long advocated for students with disabilities to be in the same setting as their nondisabled peers, and the law now requires that all students have the opportunity to learn the same content and demonstrate ability within the least restrictive environment (LRE) (Kloo & Zigmond, 2008). According to Morin (n.d.), the Individuals with Disabilities Act (IDEA) leaves LRE open to interpretation; LRE is not a place but a principle that guides an educational program (Morin, n.d.). The LRE scenarios are: general education classroom with support, inclusion classroom, special education class, and specialized program outside of the school district (Morin, n.d.).

According to the U. S. Department of Education (2016), over 60% of all students with disabilities spend 80% or more of their school day in general education classes. Canter, King, Williams, Metcalf, and Potts (2017) state that the traditional one-size-fits-all approach to curriculum does not meet the needs of today's inclusive classrooms and diverse learners. They claim that education needs to change to meet the demands to effectively educate a diverse population to be successful citizens in the 21st century. They state that one possible solution is to create a school system and environment that embraces the inclusive practices of Universal Design for Learning (UDL).

Statement of Problem

Kloo and Zigmond (2008) discuss research showing (a) highly qualified teachers increase student performance, and (b) teacher quality contributes to student achievement more than any other factor. However, according to the National Center for Education Statistics (1999), only one in five general education teachers felt that they were well prepared to work in classrooms that

included students who were culturally or linguistically diverse and students with disabilities. Even despite federal mandates to educate students with disabilities in the LRE, teachers continue to have mixed feelings about their own preparedness to education students with disabilities in the general education settings (Swain, Nordness, & Leader-Janssen, 2012).

The Council for Exceptional Children (CEC; 2005) claims that UDL acknowledges a full range of students with a goal of appropriately challenging and effectively engaging those with and without disabilities as well as those below average, average, and above average. The problem lies within teacher knowledge and use of UDL within today's classrooms. Canter et al. (2017) found varied understanding and use of UDL in their study conducted with general education and special education teacher participants in first through twelfth grade. Similarly, Lowrey, Hollingshead, and Howery (2017) concluded that their seven general education teacher participants' knowledge and use of inclusion practices and UDL varied.

Purpose of the Study

The purpose of this study was to investigate both General Education Teachers' and Special Education Teachers' knowledge and use of Universal Design for Learning as a way to successfully instruct diverse learners.

Question of the Study

Do current general education and special education teachers have knowledge of UDL? Are general and special education teachers using UDL in their classrooms? What strategies are teachers using in their classrooms that align with the guidelines of UDL?

Assumptions and Limitations

There is a time constraint imposed by the Multi-Categorical Special Education program at Governors State University graduate seminar class. Due to the limited time frame to conduct

the study and collect the data, the ability to generalize may be limited in its scope. All participants hold current Illinois Professional Educator licenses; therefore it is assumed the teachers have similar education and background.

Significance of the Study

Surveying a variety of General and Special Education teachers reveals the range of knowledge and use of universal design for learning among current educators. The knowledge gained can be used to determine whether school improvement and professional development to enhance teachers' skills sets for working with diverse learners is necessary to ensure all students find success in school.

Definition of Terms

Child with disability. As described by IDEA (2004), a child with disability is a child with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities. It is also a child who needs special education and related services due to one of these reasons.

Inclusion Classroom. The Understood Team (2017) describes this classroom as a mix of students who do and do not require special education services. They also state it is a classroom in which responsibility and teaching is equally shared by a general education teacher and a special education teacher. The teachers include lots of learning supports to help students with different learning styles and skill levels.

Individuals with Disabilities Education Act of 2004 (IDEA). Summarizing Lee (2017), IDEA is a federal law that requires schools to service students with disabilities. It is considered the nation's special education law. IDEA provides rights and protections to children with disabilities and their parents. It ensures students with disabilities have access to a free and public education and that special education is provided in the least restrictive environment (Lee, 2017).

Least Restrictive Environment (LRE). The intent of LRE is to make sure students with disabilities are included in the general education classroom as often as possible (Morin, n.d.). LRE is not a place but rather a principal that guides education programs. IDEA states that children who receive special education should learn in the LRE and this means they should spend as much time as possible with children who do not receive special education (Morin, n.d.).

Professional Development. Editorial Projects in Education Research Center (2011) states professional development is a general term that refers to the ongoing learning opportunities available to teachers and other professionals in schools. Professional development activities typically include formal teacher training, participation in subject-matter associations or informal networks, and workshops with consultants and or curriculum experts. It is often seen as vital to school success and teacher satisfaction, but also criticized for cost and lack of data to support improvement.

Response to Instruction (RTI). RTI is a screening process that identifies students with learning disabilities by providing early, immediate supports for students' needs. It is an approach that uses students' response to high-quality instruction to guide educational decisions, including decisions about the effectiveness of instruction and intervention, eligibility for special programs, design of individual education programs, and effectiveness of special education services (Strangeman, Hitchcock, Hall, Meo, et al., 2006).

Special Education. Special education refers to a range of services that can be provided in different ways and in different settings. The law requires public schools to provide special education to all children ages 3-21 that meet the criteria for disability as documented by IDEA and need special education in order to access the general education curriculum (The Understood Team, 2017).

Universal Design for Learning (UDL). Summarizing Dell, Newton, and Petroff (2012), UDL is a set of philosophies for curriculum development that gives all individuals the opportunity to learn. It takes a flexible approach rather than a one-size-fits-all approach to learning in the classroom by addressing the way information is presented, the way students demonstrate their knowledge, and the methods in which students are engaged. UDL

acknowledges the fact that everyone learns differently, and encourages teachers to design their lessons in regards to three main principles: multiple means of representation, multiple means of actions and experiences, and multiple mean of engagement.

Chapter Summary

Since 1975 there have been many legislative changes that have positively impacted the education of children. The traditional one-size-fits-all teaching approach does not meet the needs of today's inclusive classrooms that have such diverse learners. It is proven that teacher quality contributes to student achievement more than any other factor, and most recently Universal Design for Learning (UDL) has gained attention as a method that embraces individuality and allows all learners to opportunity to be successful. The concern is whether teachers have the knowledge to be able to implement UDL in their classrooms.

Chapter II

Review of the Related Literature

The intent of this review of literature is to inform the reader of how Universal Design for Learning (UDL) is a means of attaining the current expectations for educating all students within the Least Restrictive Environment (LRE), and to bring forth the current positions for knowledge and use of UDL. This review begins with definitions and explanations of UDL, its principles, and critical elements, and provides a history of the law and development of interest in the topic. After thorough description of what UDL is, this review moves into the views on UDL from studies and peer reviewed articles conducted in different environments. The benefits and challenges within different populations are discussed. Lastly, the effects that professional development in UDL can have on teachers' perceptions and use of UDL are reviewed and the benefits of implementation of UDL are discussed. The review concludes with resources available to assist in a deeper understanding of how to implement UDL in the classroom.

Universal Design for Learning

Concept

Canter et al. (2017) inform us that UDL got its roots from the architecture philosophy of Universal Design (UD). UD is an approach that focuses on creating equal means of access; it designs environments and products that are usable by everyone. For example, a ramp entrance to a building. They state "just as UD created a way to help everyone, no matter their circumstances, to navigate and function in the physical world, UDL creates a way to help everyone, no matter their circumstances, to navigate learning" (Canter et al., 2017, p. 3). King-Sears (2014) describes UDL as a proactive teaching approach. The learners' characteristics design the content

and lesson, rather than the lesson being designed and then accommodations being added on for students with different learning needs.

Definition

Dell, Newton, and Petroff (2012) state that UDL creates a way for everyone to access learning by acknowledging that everyone learns differently. The Center for Applied Special Technology (CAST), a nonprofit research organization dedicated to the UDL approach, defines it as:

a set of principles for curriculum development that give all individuals equal opportunities to learn. UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone- not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs.

(as cited in Canter et al., 2017, p.3)

Principles

There are three primary principles that guide UDL (CAST, 2011). These principles are based on neuroscience research and provide a framework for the guidelines CAST has put together to assist in curriculum design that meets the needs of all learners. The three principles are multiple means of representation, multiple means of action and expression, and multiple means of engagement (CAST, 2011).

Multiple means of representation. Students perceive and comprehend information in different ways; UDL addresses the fact that there is not one form of representation that will work for all learners and that we need to present the content of the lesson in a variety of ways (Johnson-Harris & Mundschenk, 2014). For example, textbooks are visual and involve reading.

By providing text with audio, video, and hands-on learning students are given the opportunity to access the material in a method that best suits their learning style (Dell et. al., 2012).

Examples. CAST (2011) states that to meet the needs of all learners the guidelines for this principle are to provide a) options for perception, b) options for language, mathematical expression, and symbols, and c) options for comprehension. They explain that those with sensory disabilities, learning disabilities, and language or cultural differences may all require different ways of approaching content, while others may simple grasp it more efficiently in a visual or auditory format rather than a printed one. It is important to utilize different modalities though vision, hearing, or touch and to use formats that are adjustable by the user in order to reach all students when presenting information. When using and teaching vocabulary and symbols, what might help one student might confuse another. It is important for the learner to be a part of an active process in order to transform information to useable knowledge to gain comprehension. To achieve this, information should be scaffolded, background knowledge should be activated or supplied, patterns and big ideas should be highlighted, information processing, visualization, and manipulation should be guided, and the generalization of the information should be maximized (CAST, 2011).

Multiple means of action and expression. Learners have different preferences and strengths; if teachers allow students to interact with the content in various ways then they are more likely to engage with the material (Johnson-Harris & Mundschenk, 2014). UDL acknowledges that learners interact with the material differently, and that they should be given the opportunities to show what they have learned in ways that suit their individual needs (Dell et al., 2012). An example Johnson-Harris & Mundschenk (2014) give is the reading of a novel in literature class: some students may use computers to read digital copies or audio copies, some

students reading hard copies silently at their desks, and some students in the hallway reading together.

Examples. CAST (2011) states that to meet the needs of all learners the guidelines for this principle are to provide a) options for physical action, b) options for expression and communication, and c) options for executive functions. Methods for response should be varied and tools and technology use should be optimized. Alternative requirements for timing, speed, range of motion should be considered as well as different methods for responding or indicating selections. Interaction with physical manipulatives, spell checkers, story webs, sentence starters, text-to-speech software, and web applications are all ways to include options for expression and communication. Students should be given choice in text, speech, drawing, storyboards, and other mediums to express themselves. Also, students should be guided in goal setting, aided in organization of information, and given formative feedback in order to help self-monitoring and reflection (CAST, 2011).

Multiple means of engagement. Students come from a variety of cultures, personal experiences, background knowledge, and interests so it is crucial that educators take this into consideration and provide opportunities for all to be engaged and motivated to learn (Dell et al., 2012). Johnson-Harris & Mundschenk (2014) describe this principle as “providing opportunities for students to make choices about the way they engage the material, and using relevant and authentic activities with prompt teacher feedback” (p.170).

Examples. CAST (2011) states that to meet the needs of all learners the guidelines for this principle are to provide a) options for recruiting interest, b) options for sustaining effort and persistence, and c) options for self-regulation. CAST (2011) explains that learners differ significantly in what attracts their attention and even the same learner will differ over time. In

regards to engagement, students should have choice in how to reach the learning objective. It is possible to provide students with decision and independence by providing choice in the level of perceived challenge, the tools used to gather information, the design of the finished product, the sequence or timing of completion of components of the tasks, or the type of rewards or recognition available. Students should participate in the design of the tasks and activities as well as setting academic and behavioral goals. Tasks, activities, and information should be culturally and socially relevant, age and ability appropriate, and allow for active participation, exploration, and experimentation. Students also differ in their initial motivation and their self-regulation skills, so the external environment must provide ways to support these differences. Provide reminders on goals, prompts for desired outcomes, differentiate within the activities, and vary the degrees of freedom. Students must be able to communicate and collaborate; cooperative learning should be encouraged and supported. Students can benefit from supports for expectations and modeled metacognition. They should be encouraged to self-reflect and recognize they are making progress (CAST, 2011).

Critical Elements

The Universal Design for Learning Implementation and Research Network (UDL-IRN, 2011) states that for instruction to align with UDL it must include each of the four critical elements: clear goals, intentional planning for learner variability, flexible methods and materials, and timely progress monitoring. Figure 1 presents the critical elements in more detail. Johnson-Harris and Mundschenk (2014) explain that in UDL the goals are separate from the means for achieving it; this allows for the flexibility of how the goal is achieved. Also in UDL the teacher assesses learning in flexible ways; students can select assessment options that minimize their

weaknesses and maximize their strengths. This flexibility agrees with and can be seen as specific examples within the guidelines of CAST above.

Element 1: Clear Goals

- Goals and desired outcomes of the lesson/unit are aligned to the established content standards.
- Goals are clearly defined and separate from means. They allow multiple paths/options for achievement.
- Teachers have a clear understanding of the goal(s) of the lesson and specific learner outcomes.
- Goals address the needs of every learner, are communicated in ways that are understandable to each learner, and can be expressed by them.

Element 2: Intentional Planning for Learner Variability

- Intentional proactive planning that recognizes every learner is unique and that meeting the needs of learners in the margins- from challenged to most advanced- will likely benefit everyone.
 - Addressing learner strengths and weaknesses, considering variables such as perceptual ability, language ability, background knowledge, cognitive strategies, and motivation.
 - Anticipates the need for options, methods, materials, and other resources- including personnel- to provide adequate support and scaffolding.
 - Maintains the rigor of the lesson- for all learners- by planing efforts (1) that embed necessary supports and (2) reduce unnecessary barriers.

Element 3: Flexible Methods and Materials

- Teachers use a variety of media and methods to present information and content
- A variety of methods are used to engage learners (e.g., provide choice, address student interest) and promote their ability to monitor their own learning (e.g., goal setting, self-assessment, and reflection).
- Learners use a variety of media and methods to demonstrate their knowledge.

Element 4: Timely Progress Monitoring

- Formative assessments are frequent and timely enough to plan/redirect instruction and support intended outcomes.
- A variety of formative and summative assessments (e.g., projects, oral tests, written tests) are used by the learner to demonstrate knowledge and skill.
- Frequent opportunities exist for teacher reflection and new understandings.

Figure 1. Critical Elements of UDL created by the UDL Implementation and Research Network (UDL-IRN), Michigan Integrated Technology Supports (MITS), and CAST (UDL-IRN, 2011).

History

Swain, Nordness, and Leader-Jansen (2012) explain that the Least Restrictive Environment (LRE) mandate was written into law in the 1970s but took much longer to implement. In the late 1970s students with disabilities rarely encountered students without disabilities and were primarily educated in separate settings. Throughout the 1980s, the philosophy of mainstreaming allowed students with disabilities to participate in general education classes when they were able to keep up with traditional academic content with little or no support. Later in the 1990s and now today, the philosophy of inclusion is being practiced more frequently with students with disabilities educated in the general education classroom with accommodations and adaptations provided.

Edyburn (2010) claims that the principles of UDL were developed following the 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA). Students with disabilities had gained access to the general education classroom, and interest in inclusion sparked. Students were now included physically, but the concern was how students with disabilities would access the general curriculum. In 1999 CAST received federal grant money to establish the National Center on Accessing the General Curriculum and quickly presented their work at the annual Office of Special Education (OSEP) Project Directors' conference. The first wave of national attention towards UDL then began as CAST published numerous documents and was well received by the research community. The second wave of attention towards UDL came in 2002 when CAST published a book with the conceptual framework of UDL. It challenged educators to think of their curriculum, not their students, differently and apply the universal design of architecture to education.

Edyburn (2010) explains that Universal Design (UD) was given meaning in law through the Assistive Technology Act of 1998 and was officially defined in law governing special education in the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA). Later, in the Higher Education Opportunity Act of 2008 the term universal design for learning was defined as:

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. (Edyburn, 2010, p. 34)

21st Century Learning

Canter et al. (2017) claim that changes in society prompted from advances in technology are occurring at a faster rate than ever and this is creating circumstances that warrant change in American education. They state:

the most pressing challenges and changes facing U.S. public schools are (a) an increase in diversity in the classroom, (b) a rise in mandated movements to recognize and respect diversity and promote global awareness, (c) a push for inclusionary policies and practices, (d) a move to standards-based curricula and increased accountability of total student achievement, and (e) an increase in access to and emphasis on technological advances. (p. 2)

They claim that one solution is to create a school system and environment that embraces the inclusive practices of Universal Design for Learning (UDL).

Students with Disabilities

IDEA classifies a child with a disability as one with “mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities” (IDEA, 2004). The National Center for Educational Statistics (2016) inform that data collection to monitor compliance with IDEA began in 1976, and the number of children ages 3-21 who received special education services in 2014-2015 school year was 6.6 million, or 13 percent of total public school enrollment. The most prevalent type of disability was specific learning disability. “A specific learning disability is a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations” (The National Center for Educational Statistics, 2016). Table 1 shows the percentage of students within an IDEA disability category that was enrolled in a public school during the 2014-2015 school year.

The National Center for Educational Statistics (2016) also summarizes the educational environments students ages 6-21 were served in during the 2014-2015 school year. They found that 62 percent of students served under IDEA spend most of the school day (80 percent or more of their time) in general education classes. This number has increased drastically from 33 percent in 1990. They further break this information down to state that 87 percent of students with speech or language impairments and approximately two-thirds of students with specific learning

disabilities, visual impairments, other health impairments and developmental delays spent most of their school day in general education classes.

Table 1

Prevalence of children aged 3-21 served under IDEA by disability type for the 2014-2015 school year.

IDEA Disability Type	Percentage of children served
Specific learning disability	35
Speech or language impairment	20
Other health impairment	13
Autism	9
Intellectual disability	6
Developmental delay	6
Emotional disturbance	5
Multiple disabilities	2
Hearing impairment	1
Orthopedic impairment	1
Deaf-blindness	< 0.5
Traumatic brain injury	< 0.5
Visual impairment	< 0.5

NOTE: U.S. Department of Education, Office of Special Education Programs, (2016).

Special Education Views

Special education researchers have realized that UDL is a promising way to meet the educational needs of diverse learners (Canter et al., 2017). Johnson-Harris and Mundschenk (2014) contend:

implementing a UDL framework while designing lessons, rather than adding modifications later, streamlines the process through which teachers provide effective

instruction for all learners in feasible and functional ways. Thus, UDL is especially appropriate for use in general education classrooms where students with high-incidence disabilities, such as learning disabilities (LD) and behavior disorders (BD) are present (p. 168).

UDL calls for variety, flexibility, and support. Johnson-Harris and Mundschenk (2014) state that since students are allowed choices they can minimize their weaknesses, avoid being punished for deficits, and maximize their strengths. They also claim that UDL creates an environment where the supports are available to all students, so the stigmas associated with certain supports are diminished, and students can access accommodations without being singled out.

Students with Behavioral Disorders

Johnson-Harris and Mundschenk (2014) posit that UDL makes it possible for teachers in inclusive classrooms to provide a more effective environment for students with challenging behaviors or disabilities. The use of UDL allows these students to receive the necessary supports rather than be sent to another classroom because the supports are built into the lessons and environment through UDL principles. They also claim that teachers who understand that the best behavior management is effective instructional practice can support active engagement and increased academic achievement by utilizing UDL. Johnson-Harris and Mundschenk (2014) state it is a way to create flexible instructional environments that offer choice, incentives, learning and behavioral supports, and ongoing evaluation of students' learning.

Johnson-Harris and Mundschenk (2014) describe a high school English teacher who proactively planned her lessons considering student strengths, interests, and reading, writing, and behavioral deficits in her inclusive classroom. First, they concluded that utilizing UDL to incorporate student strengths and interests throughout the presentation of the content as well as

providing choices for how students engage with the content makes instruction run more smoothly in the inclusive classroom. Second, UDL allows students with behavioral disorders to engage in a way that interests them, challenges them, builds on their strengths, and does not stigmatize them. Lastly, incorporating UDL saves teachers time and energy as well as enhances their classroom dynamic through the aspect of planning ahead for challenging behavior.

Students with Disabilities and STEM Education

Basham and Marino (2013) claim that very few students with disabilities pursue careers in science, technology, engineering, and mathematics (STEM) due to their struggle with STEM content at the K-12 level. “The success of students with disabilities who participate in general education STEM classes are directly linked to teachers’ abilities to understand students’ unique learning needs and problem-solving abilities” (Basham & Marino, 2013, p. 9). CAST claims “incorporating the principals of UDL can enhance the accessibility of STEM curricular materials and improve educational experiences for a wide range of students with diverse learning needs (as cited in Basham and Marino, 2013, p. 9). Basham and Marino conclude that providing students access to the STEM education is all about the curriculum design. They claim this design should account for the four critical elements required for UDL in order to scaffold material and design engaging materials that offer a wide range of metacognitive and content specific instructional supports.

Response-to-Instruction

Strangeman et al. (2006) state that “RTI and UDL share the objective of improving educational outcomes for students with disabilities and are similar in several important ways” (p. 8). First, they both recognize underachievement may be a result of poor instruction and curriculum and not necessarily student deficits. Second, they both are based on the understanding

that not all students learn the same way and that curriculum should be flexible and accommodating. Third, they both recognize assessment as a means for determining instruction and intervention rather than a grade determining student ability.

They summarize that the difference is that RTI is a process for making educational decisions for at risk-students and that UDL is a process for designing curriculum that maximizes all students' success in the general education setting. They claim that although they differ in these ways, UDL can be used to target and improve some aspects of RTI. They claim that UDL can be used to design more flexible RTI interventions and as a guide to make decisions about the success of the interventions. They also state that UDL offers ways to extend the general curriculum through use of technology and other nontraditional forms of instruction.

Students with Intellectual Disability (ID)

Lowry, Hollingshead, and Howery (2017) investigated the language teachers used regarding inclusion, UDL, and students with ID through a secondary analysis of phone interviews. Seven general education teachers from both the US and Canada that had worked in a school district that went through districtwide implementation of UDL framework for more than a year and had at least one student with moderate to severe ID included in their class were originally interviewed. Many stories described the classroom having a sense of belonging; students are engaged through having choice and autonomy and they seek help from each other creating collaboration and community. However, it was found that most of the teachers used exclusionary language. Lowry et al. (2017) describe that “language like this predisposes teachers to think of students with ID as less able, regardless of their age” (p. 18) and explain that this could influence their age appropriateness to the curriculum used with students. They explain that UDL is a framework that should promote high expectations to maximize motivation and

foster collaboration and community to strengthen the sense of belonging amongst all students.

They stated:

some of the terms the teachers chose to talk about the students with ID could make one question if inclusive classrooms have effectively moved passed physical inclusion, if teachers are intentionally building a sense of membership and belonging for all students, and if teachers are providing instruction accessible to all students. (p. 18)

They found it concerning that several teachers do not believe that UDL requires intentional planning, that UDL is just good practice and is something they already do. It was also found that the teachers felt that they were not as successful as they had wanted to be in providing access, participation, and progress for all students in their classrooms.

Lowry et al. (2017) was able to draw conclusions about the knowledge and use of UDL for general education teachers, but was not able to draw conclusions regarding students with intellectual disabilities. They claim:

the varied understanding and implementation of inclusive education, the varied understanding and implementation of UDL, along with the low representation of learners with ID within these initiatives hinders the ability to measure the effectiveness of UDL in inclusive settings for these learners. (p.15)

Professional Development for UDL

Canter et al. (2017) conducted mixed methods research over the course of a year and a half through surveys, interviews, and direct observations to determine the effect of a professional development program on teachers' perceptions, conceptualizations, and implementation of UDL principles in their classrooms. There were 14 participants from 11 classrooms elementary through high school. General educators, special educators in the general curriculum, and special

educators in the adapted curriculum completed a pre-survey with three sections (instructional practices, experiences with UDL, and technology integrations), attended professional development sessions throughout the school year, and then post observations and interviews were completed the following fall. Canter et al. (2017) found that perceptions and conceptualizations of UDL, implementation of UDL principles in the classroom, and how to use technology appropriately and effectively to support UDL increased across the board for all participants and settings. The highest percentage of change was seen in the inclusion classes with overall gains of 56-96%. At the beginning, 29% of teachers could identify the three principals of UDL and at the end 93% could. The posttest survey indicated the participants were more able to create learning opportunities in the general curriculum setting via their teaching approaches for students with developmental or cognitive delays. Participants reported integrating more technology components than ever before, focusing on students' engagement, and use of more creativity and a safe atmosphere that encourages risk taking. They also emphasized adapting materials and making them more multi-sensory as well as hands on.

Canter et al. (2017) concluded that when offered the time and resources for training and planning, teachers can, and will, shift their instructional practices to reflect universally designed instructional settings that will likely better meet the needs of their students. They also stated that the results cannot be generalized, but the trends found show that the "UDL framework and infusion of technology along with adequate support and training during implementation, result in instructional practices that are more inclusive of all diverse learners across educational settings" (p. 15).

Challenges

The teacher participants in the study conducted by Canter et al. (2017) reported the challenges with UDL are: time, lack of funding, anxiety about learning a new technology, and coming up with ideas for students with more significant needs. They repeatedly expressed that the lack of work days, large caseloads, and added demands on teachers make it difficult to be able to be flexible and creative, as well as find time to learn new things. Participants also expressed that they would like ongoing training sessions, time to prepare and implement what they learned, as well as time to do peer visits to classrooms where UDL is modeled and well integrated.

Agreement of Benefits of PD

Dalton, Mckenzie, and Kahone (2012) conducted a study in Cape Town, South Africa on the impact of professional development on UDL for professionals in the educational field. Thirteen participants (including occupational therapists, teachers, managers of inclusive educational organization, and speech therapists) attended a full day workshop of UDL. The workshop was led by a UDL expert who completed her postdoctoral fellowship in UDL leadership at Boston College and the CAST Center. They were taught background, principles, assistive technologies, how to use it to diversify curriculum, and practical applications. After one day of training, the participants were able to identify examples of the three principles and ways to implement UDL with and without technology. This affirms the simplicity of UDL, upon receiving professional development on it. They found several compelling reasons why UDL is a means for improving inclusive education; the participants reported they gained a better understanding of how to differentiate instruction, how to utilize assistive devices, and how to collaborate with other specialists in the educational field.

Implementing UDL

Dymond et al. (2006) conducted a study in a high school of 1500 students in Illinois to examine how implementation of UDL affects the teachers and students in a general education science class. A high school curriculum science course was redesigned to incorporate UDL principles to promote access to the general curriculum. Two sections of the course were redesigned, and each section had students with mild and severe disabilities. The redesign involved changes to instructional delivery, organization of the learning environment, student participation, materials, and assessment. The traditional lesson plans were redesigned based on the core ideas of UDL, the instructional strategies provided students with choices on how to learn and how to participate, students were strategically groups for instruction, and adult roles were adjusted as needed for effective student support. Data was collected across one school year through documents, interviews, and focus groups. This study found many positive outcomes and benefits for teachers and for students. These outcomes are discussed further in the following sections: instructional gains, lesson planning development, effectiveness of intervention, student outcomes, and teacher focus group results.

Instructional Gains

The general education teacher expressed greater ownership for helping all students to learn rather than the co-teacher or paraprofessional responsible for specific students. The co-teacher's role shifted to co-planning, co-delivering instruction, and working with all students. Paraprofessionals expanded from one on one to small group support. The special education teacher took more responsibility to train paraprofessionals, plan instruction, and teach general education teachers different strategies.

Lesson Planning Development

The lessons increased options for students. They were able to work individually or make choice of role in group work, as well as make choice in read, listen, explore software, or work with a partner. The lessons were more active and interactive. They included hands on activities, team projects, and students teaching other students. Overall, there was a variety of materials used in class.

Effectiveness of the Intervention

Teachers reported utilizing UDL enabled all students to participate. The teachers stated that due to implementation of strategically placed groups, differentiation, and allowing student choice both student engagement and student participation increased. They also reported the students enjoyed the variety of materials, and noted changed in student completion of work.

Student Outcomes

Change was apparent for all students in the science classes. Three of the four students with significant cognitive disabilities (SCD) developed their social skills; they wanted to communicate more, they were more comfortable around people, and they were more skilled at reading the social cues of others. The goals for students with SCG changed from socializing to main concepts of the science curriculum. The students, both with and without disabilities, learned to work together effectively and friendships emerged due to the structured opportunities created. The students without SCG participated more, completed more, improved personal responsibility, and improved end of the year test scores.

Teacher Focus Group Results

At first, the teachers were hesitant to write formal lesson plans, but by the end of the year they were adamant about the importance of lesson planning. They agree it organized instruction

and improved communication. In the past, the general education teacher assumed sole responsibility for planning, but the redesign process involved all six members of the research team. They all agreed team planning is essential to improving instruction and effectiveness.

UDL Resources

UDL and Principles Overview

CAST (2017) provides an overview of UDL. The following link will take you to a webpage with a short video that provides a simple definition and breakdown of the term Universal Design for Learning as well as a short, to the point explanation of the three principles.

<http://www.cast.org/our-work/about-udl.html#.Wc-W71tSzIU>

UDL Principles and Guidelines Chart

CAST (2011) created UDL Guidelines as a way to express the UDL framework. They have created guidelines that coincide with each of the three principles and organized them into a chart that can assist in planning lessons and units. Each of the principles, representation, action and expression, and engagement have specific checkpoints underneath them. Figure 2 is the chart and the link below will take you to an electronic PDF copy of it.

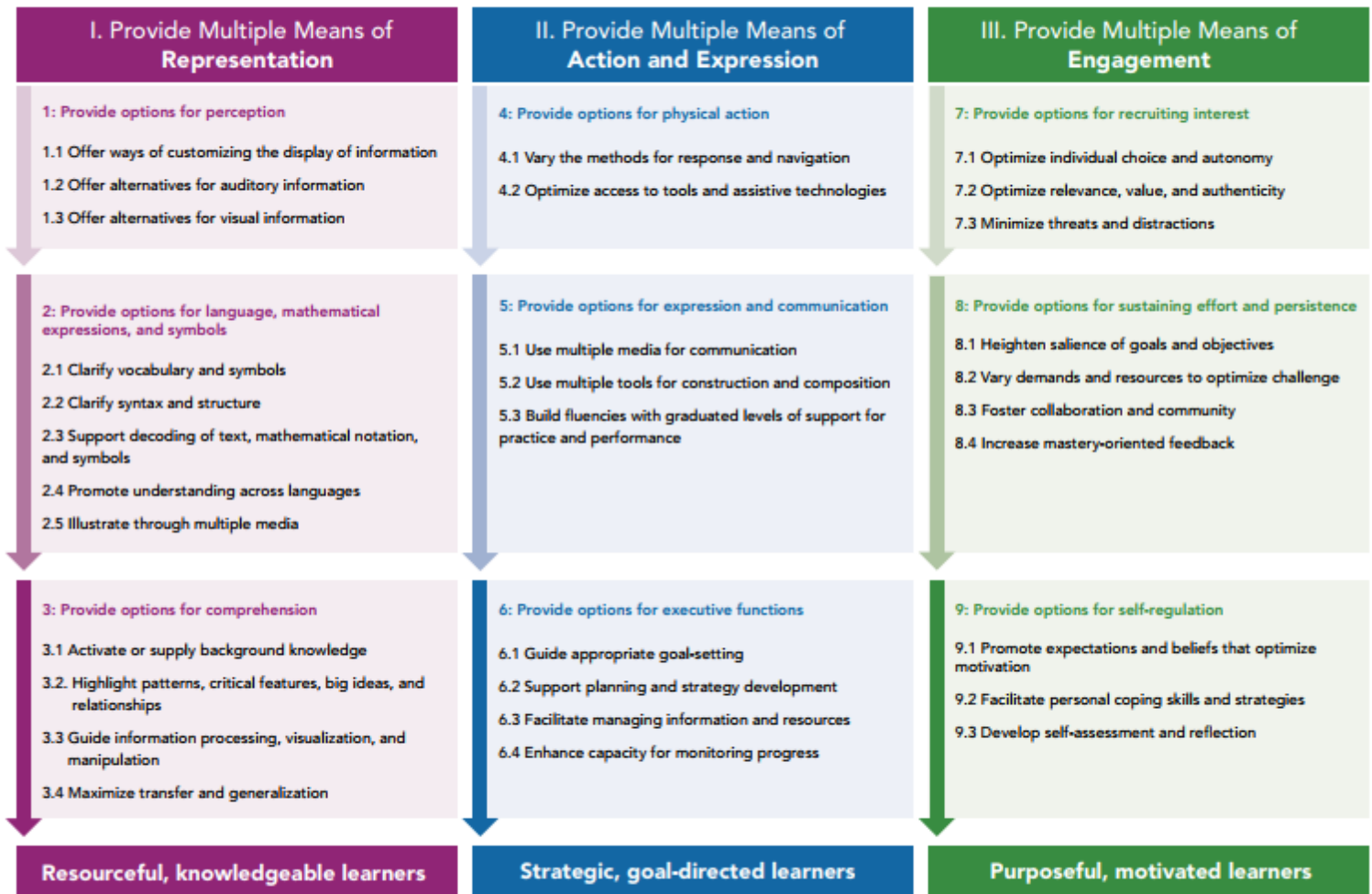
http://www.udlcenter.org/sites/udlcenter.org/files/updateguidelines2_0.pdf

Examples of Each Checkpoint

CAST (2014) provides examples and resources for each of the checkpoints listed in the guidelines electronically on the website listed below. This resource can help clarify what each checkpoint is as well as provide practical ways for teachers to implement UDL in their classrooms. For example, if you go to the website and click on Checkpoint 2.1: Clarify vocabulary and symbols, eleven different resources are given with links to each source and a description of what content area it can be used in and how it satisfies the UDL guideline.

<http://www.udlcenter.org/implementation/examples>

Universal Design for Learning Guidelines



© 2011 by CAST. All rights reserved. www.cast.org, www.udlcenter.org
 APA Citation: CAST (2011). *Universal design for learning guidelines version 2.0*. Wakefield, MA: Author.

Figure 2. Guidelines for the principles of UDL from the UDL center (CAST, 2011).

Conclusion

UDL is a scientifically validated framework that includes all aspects of today’s diverse classroom, and teachers should not only be aware of it but should be implementing it. The research reviewed shows the importance of UDL, the effects and benefits it has, as well as some

lack of understanding and implementation. The study conducted by Lowry et al. (2017) with general education teachers brings forth evidence that general education teachers are under-prepared for the diversity of students in today's classrooms. It also shows the lack of education that current teachers have with the concept of UDL as it was concluded that understanding and implementation of inclusive practices and UDL are varied. However, the research conducted by Canter et al. (2017) and Dalton et al (2012) shows that if teachers are informed of and trained in the practices of UDL, they will incorporate them and engage in practices that are more inclusive of all the diverse learners. UDL was proven beneficial to teachers' planning and instructional methods and to students in both social and academic capacities in the implementation study by Dymond et al. (2006).

Chapter Summary

“UDL is a framework that supports the needs of all learners, including those with disabilities or who are from culturally and linguistically diverse backgrounds” (King-Sears, 2014, p.1). UDL re-conceptualized curriculum design by contrasting the traditional one-size-fits-all approach that is designed to meet the needs of the typical student to one that considers student diversity the most important factor and supports their needs with flexible and accommodating design (Strangeman et al., 2006). UDL goes beyond access, as it builds in support and challenges so that the learning goals, methods, materials and assessments work for everyone (CAST, 2017).

CAST (2017) explains the three principles of UDL are designed so that each student can make progress via their own flexible path. The principles guide curriculum to be presented in multiple medias with varied supports, to give options for students to express what they know, and to consider the interests of individual students. UDL addresses the goal to get rid of barriers caused by the curriculum and keep the challenge where it belongs by creating equal learning opportunities for all (CAST, 2017).

Data from The National Center for Educational Statistics (2016) shows the diverse special education population in the classrooms today. Studies in the special education field are showing progress in reaching these diverse populations. Special education researchers have realized that the innovative practices of UDL holds promise in meeting the educational needs of diverse learners (Canter et al., 2017). Johnson-Harris and Mundschenk (2014) found UDL effective in inclusive classrooms with children with challenging behaviors and disabilities, Basham and Marino (2013) claim students with disabilities will benefit from UDL designed

STEM classes, and Strangeman et al. (2006) states that UDL can be used to design RTI, interventions, and nontraditional forms of instruction.

Although Lowry et. Al (2017) found varied understanding and implementation of UDL, there is promise that through professional development on the topic professionals in the field can gain enough knowledge to be comfortable implementing it. Canter et al. (2017) and Dalton et al. (2012) both found huge gains in lesson planning and organizing instruction to meet all learners as well as teacher confidence to implement UDL in the classroom after the participants received professional development. Furthermore, the study conducted by Dymond et al. (2006) shows the numerous benefits redesigned courses that incorporate UDL can have. The teacher's beliefs and roles, the instructional planning, design, and activities, and the students' social and academic skills all benefited in a variety of positive ways due to the change in curriculum.

Chapter III

Methodology

This study aims to bring to light the status of current teachers' knowledge and use of Universal Design for Learning as a way to reach all learners. Survey research is often designed to describe current conditions, as it reports the way things are (Gay, Mills, & Airasian, 2012). This study utilized quantitative research via survey design to collect numerical data to examine general and special education teachers' knowledge and use of UDL in the Chicago metropolitan area. A variety of current licensed and employed general education and special education teachers were surveyed.

Participants

The pool of participants was drawn from various schools in the Chicago metropolitan area using a purposive sample approach (Gay et al., 2012). All participants hold a current Illinois Professional Educator License and currently are teaching in the state of Illinois. The participants surveyed are not limited by their subject area, grade level, or years of experience. Their identities remain confidential, as the survey reports all answers anonymously. By submitting the completed survey, the participants were consenting to participate in this study.

Instrument

A cross-sectional survey is an observational study in which data is collected from a population at a specific point in time (Gay et al., 2012). A cross-sectional survey was developed to administer to the participants of this study. The survey is informal and was designed for teachers to show the knowledge they have on UDL and how they use UDL in their classrooms. Description of survey sections are as follows.

Demographics

This section sought to gather background information and teaching experience on each respondent. Respondents answers how many years they have taught, what grade level and subject areas they currently teach, and what type of classroom they teach in (general education, co-taught, self-contained, resource, etc.). The teachers were also asked if they have a special education endorsement or special education degree.

Survey on Use of UDL

Section II of the survey sought to gather information on the different ways the teachers utilize the UDL guidelines. Teachers were asked to select their top 5 strategies used on a weekly basis within the three different principles of UDL (multiple means of representation, multiple means of action and expression, and multiple means of engagement).

Survey on Knowledge of UDL

Section III of the survey included an attitude scale. An attitude scale is an instrument that measures what an individual believes, perceives, or feels (Gay et al., 2012). A five point Likert scale required individual responses to a series of statements claiming: strongly agree (5), agree (4), undecided (3), disagree (2), or strongly disagree (1). Survey respondents were asked whether they are familiar with UDL, whether they incorporate UDL into their lessons, and if they have had professional development or pre-service training on UDL. In this section they are also asked to identify the 3 main principles of UDL.

Reliability and Validity

Gay et al. (2012) clarify that reliability is the degree to which an assessment tool produces stable and consistent results. The survey utilized in this study was created by the researcher and was utilized only once for this study. Therefore, the reliability of the results

cannot be studied or verified at this time. Validity is described as the degree to which a research study measures what it intends to measure (Gay et al., 2012). The survey utilized was reviewed by one Governors State University professor, three special education teachers, and one general education teacher. Each provided feedback and confirmed the survey is acceptable in terms of content validity to measure teachers' knowledge and use of UDL.

Procedure

To further investigate teachers' knowledge and use of UDL a survey was designed titled "Universal Design for Learning Survey" by the author and researcher of this study.

Data Collection

This survey was passed along to different educators in various schools via email. The principal of the researcher's school approved the distribution of the survey through use of work email addresses. The participants were given two weeks to fill out the Google Form; after one week, an email reminder was sent to non-respondents.

Data Analysis

The Google Form survey responses were automatically exported to Google Sheets. The data accumulated was then exported to Microsoft Excel to be further organized and analyzed. Basic descriptive statistics were calculated in order to express general findings about teachers' knowledge and use of UDL. Data was arranged in graphical, tabular, and narrative formats.

Chapter Summary

The purpose of this study was to investigate teachers' knowledge and use of Universal Design for Learning. A quantitative descriptive approach using survey design was utilized for this study. The population that took part in this research project included current licensed special education teacher and general education teachers in various grade levels, subjects, and classroom types in the Chicago metropolitan area. The instrument used for this study was created by the author and researcher. The instrument asked responders to answer basic but non-identifying demographic information, identify the strategies they use in their classroom most frequently, and complete a rating scale on their knowledge of UDL. Surveys were administered during a two week window. Once the survey time frame was completed, the data was collected, organized, and analyzed to gain further understanding of current teachers' knowledge and use of UDL.

Chapter IV

Results

This chapter contains results of the investigation into current teachers' knowledge and use of Universal Design for Learning. At the close of the data collection period a total of thirty three surveys had been completed. The data was logged in a spreadsheet, further organized and analyzed, and the results were grouped into the three main categories discussed below.

Demographics

The respondents to this survey averaged 9.06 years of overall teaching experience, with a standard deviation of 6.23 and a range of 1 year to 25 years. Table 2 summarizes the gender, current teaching position, degree earned, and special education certification of the participants.

Table 2

Summary of Participant Demographics

Category		Number	%
Gender	Male:	4	12
	Female:	29	88
Current Teaching Position	General Education Teacher:	16	48
	Special Education Teacher:	17	52
Special Education	Special Education Degree:	13	39
	Special Education Endorsement:	4	12
	Neither:	16	48
Highest Degree Earned	Bachelor:	12	31
	Master:	20	66
	Doctorate:	1	3

NOTE: Percentages may not add to 100 because of rounding.

The current teaching role was almost evenly split, with 48% of participants General Education Teachers and 52% of participants Special Education Teachers. No General Education Teacher participants hold special education certification. Table 3 summarizes the demographic information collected in the survey in regards to participants' current teaching roles.

Table 3

Summary of Participant Teaching Roles

Category		Number	%
Type of classroom	General Education:	16	48
	Co-Taught:	19	58
	Self- Contained:	10	30
	Resource:	2	6
	Credit Recovery:	1	3
Grade Level	Pre-School:	1	3
	Elementary:	1	3
	Middle School:	1	3
	High School:	30	91
Subject Taught	English	4	12
	ELA/Reading	4	12
	Math	25	76
	Science	5	15
	Social Studies/History	4	12
	Vocational	1	3
	Family and Consumer Science	1	3

NOTE: Percentages may not add to 100 due to participants selecting more than one

Of the 16 General Education Teachers, 7 of them were also in co-taught classrooms working alongside a Special Education Teacher. Of the 17 Special Education Teachers, 4 teach

only in self-contained rooms, 8 teach in only co-taught classrooms, and 5 teach in both self-contained and co-taught classrooms. Overall, 24 of the 33 participants (or 73% of participants) instruct students with disabilities.

Knowledge of UDL

There were three questions the participants were asked in regards to their knowledge of UDL. They were asked to rate their level of agreement with a statement; the results are in figure 3. Those three statements responses were then further examined in order to compare General Education and Special Education teachers' knowledge. Figures 4, 5, and 6 show the breakdown of those responses.

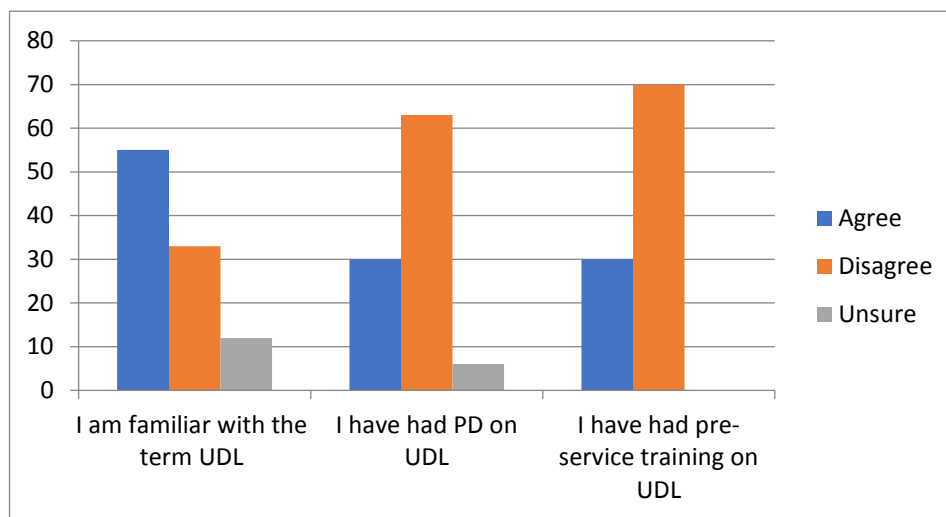


Figure 3. Teacher knowledge of UDL results. This figure shows the results, in percentages, to the 3 questions in the survey that measured teachers' knowledge of UDL.

Overall, 55% of teachers stated they are familiar with the term Universal Design for Learning. However, more than 60% of teachers claim they have not had any training on UDL via professional development or pre-service schooling.

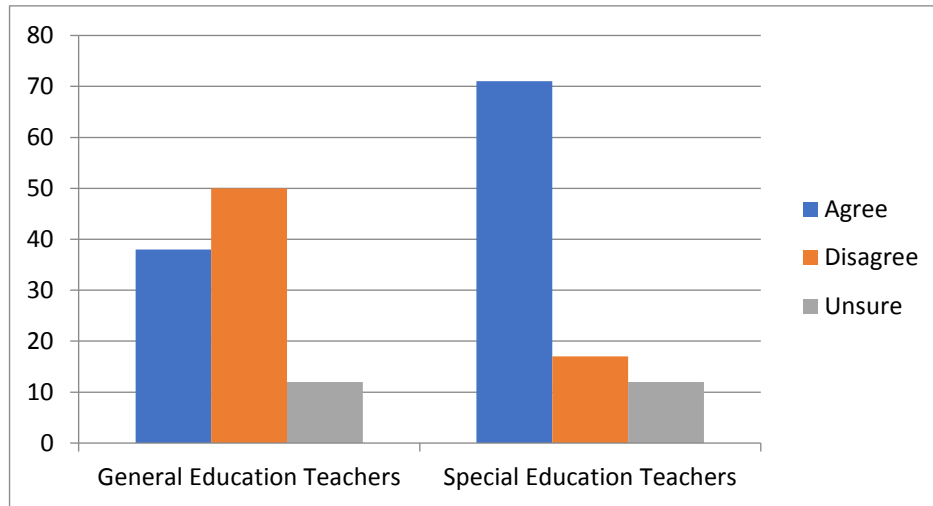


Figure 4. I am familiar with the term UDL breakdown. This figure shows the breakdown of responses of General Education and Special Education teachers, in percentages.

Comparing the two, significantly more special education teachers claim familiarity with the term UDL than general education teachers. 71% of special education teachers agreed with the statement, whereas 38% of general education teachers agreed with the statement. There were 3 general education teachers and 3 special education teachers that selected “unsure” as a response.

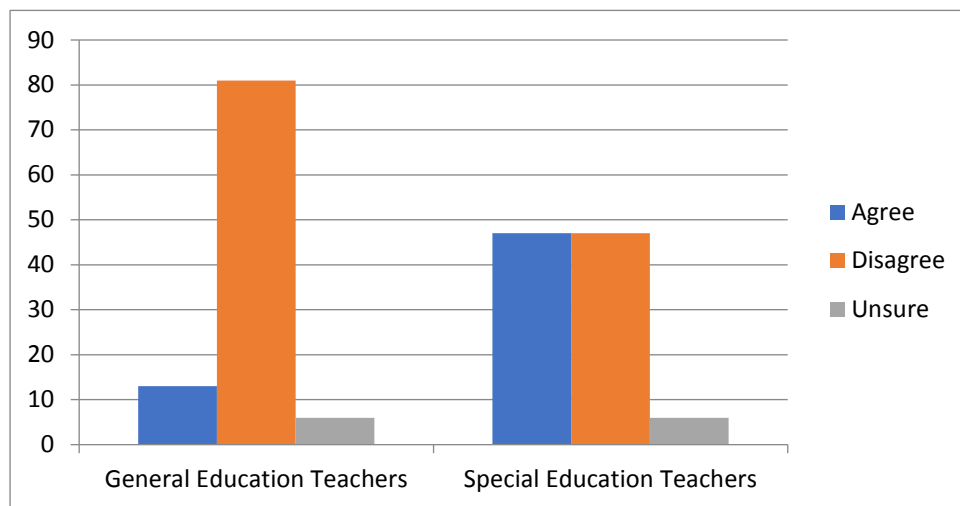


Figure 5. I have had professional development on UDL breakdown. This figure shows the breakdown of responses of General Education and Special Education teachers, in percentages.

Comparing the two, more special education teachers claim to have had some form of professional development on UDL. Specifically, 10% of general education teachers and 47% of special education teachers agreed with the statement. There were 2 general education teachers and 2 special education teachers selected “unsure” for this statement.

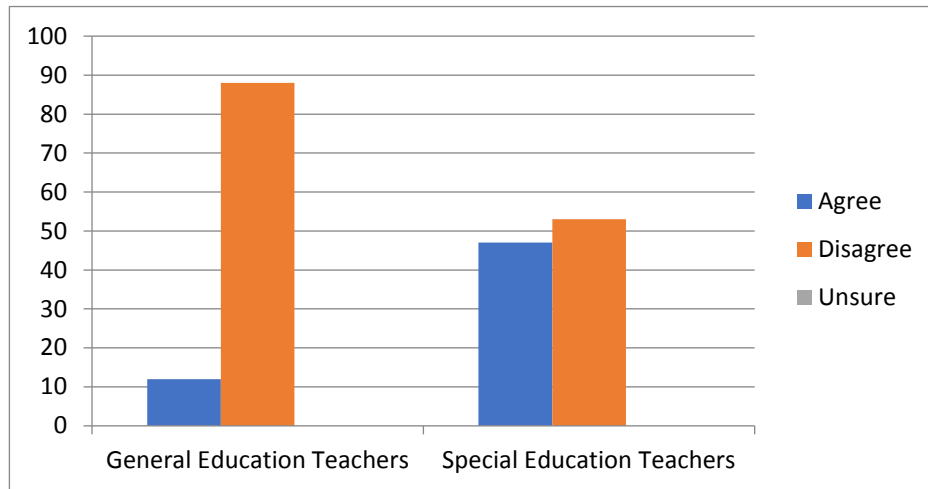
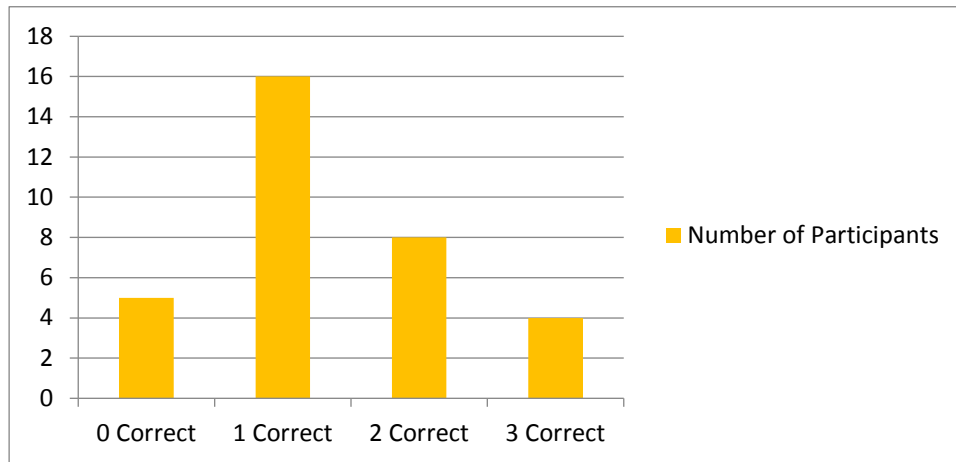


Figure 6. I have had pre-service training on UDL breakdown. This figure shows the breakdown of responses of General Education and Special Education teachers, in percentages.

For each type of teacher, the majority disagreed with the statement. Only 12% of general education teachers claim to have had pre-service training of UDL, which is 2 of the 16 respondents. For special educators, 47% claim to have had pre-service training on UDL, which is 8 of the 17 respondents.

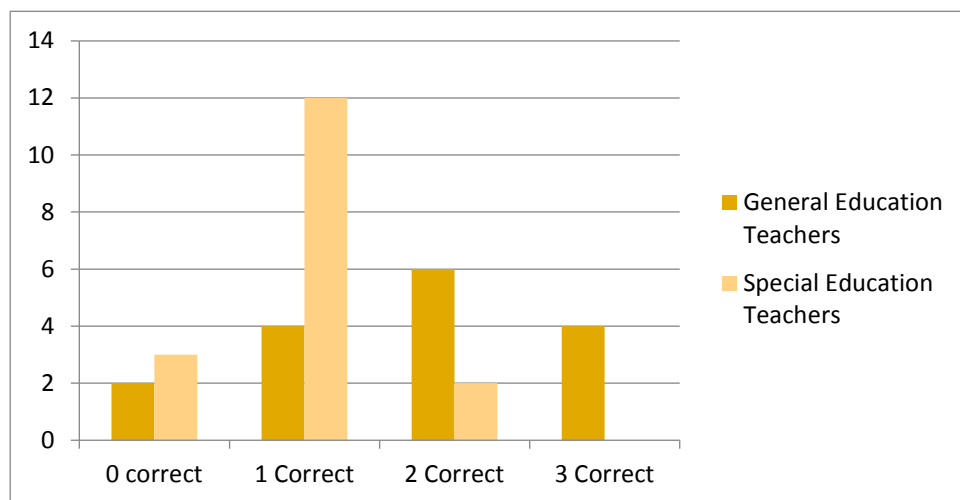
To further examine the participants’ knowledge of UDL, they were asked to identify the three principles of UDL. There were six options, and they were asked to select the correct 3; the results are in figure 7. Those results were then broken down to compare General Education and Special Education teacher responses; the results are in figure 8.



NOTE: There were 6 options to choose from with only 3 correct

Figure 7. Identify the 3 principles of UDL results. This figure shows the number of participants that identified 0, 1, 2, or 3 principles correctly.

It is clear that the majority of respondents do not know the principals of UDL, as only four participants (10%) correctly identified all three. The majority of participants were only able to correctly identify one principle.



NOTE: There were 6 options to choose from with only 3 correct

Figure 8. Identify the 3 principles of UDL breakdown. This figure shows the number of General Education vs Special Education teachers for each amount of correct principles identified.

The four participants that were able to correctly identify the principles of UDL were all general education teachers; 25% of general education teacher participants correctly identified the principles. Comparing the two different groups of teachers, 10 general education teachers (or 62% of general education teachers) were able to identify two or three correct principles, whereas only 2 special education teachers (or 12% of special education teachers) were able to identify two or three correct principles.

Use of UDL

There were two statements used to measure teachers' use of UDL. The participants were asked to rate their level of agreement with these two statements; the results are in figure 7. These two statement responses were further examined in order to compare General Education and Special Education teachers' use. Figures 8 and 9 show the breakdown of those responses.

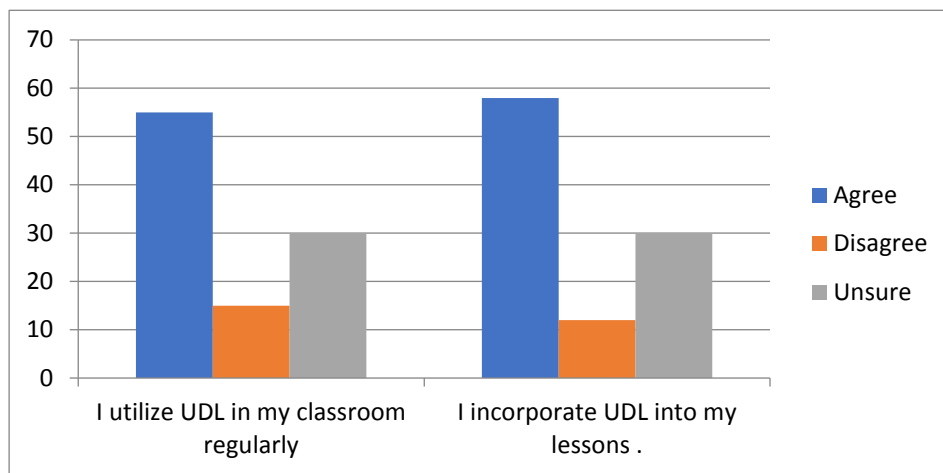


Figure 9. Teacher use of UDL results. This figure shows the results, in percentages, to two questions in the survey that measured teachers' use of UDL.

The data shows that more 50% of teachers agree with both of these statements. More than half of the participants claim to utilize UDL in their classrooms and lesson. These two statements also received a higher amount of "unsure" responses.

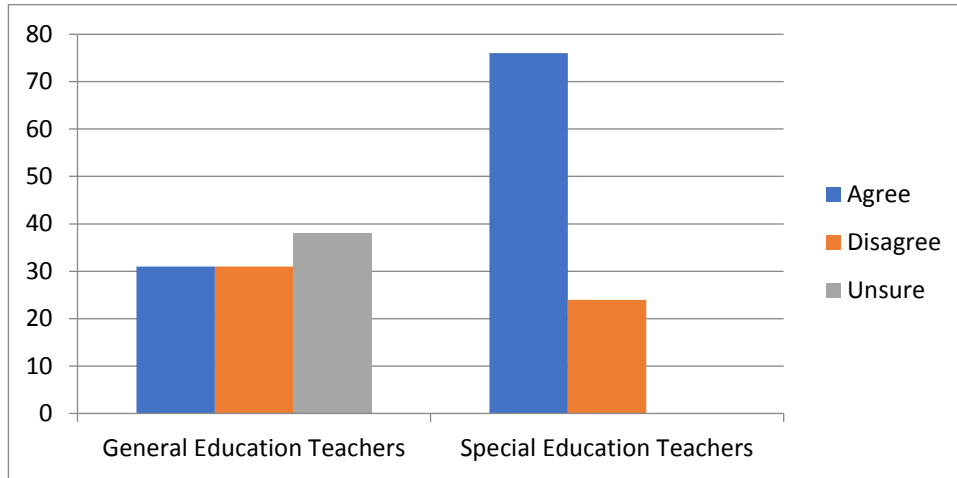


Figure 10. I utilize UDL in my classroom regularly breakdown. This figure shows the breakdown of responses of General Education and Special Education teachers (in percentages).

Far more special educators claim to utilize UDL in their classrooms than general education teachers; 76% agreed with the statement. The highest response for general educators was unsure, at 38%, and then an equal split for agree versus disagree.

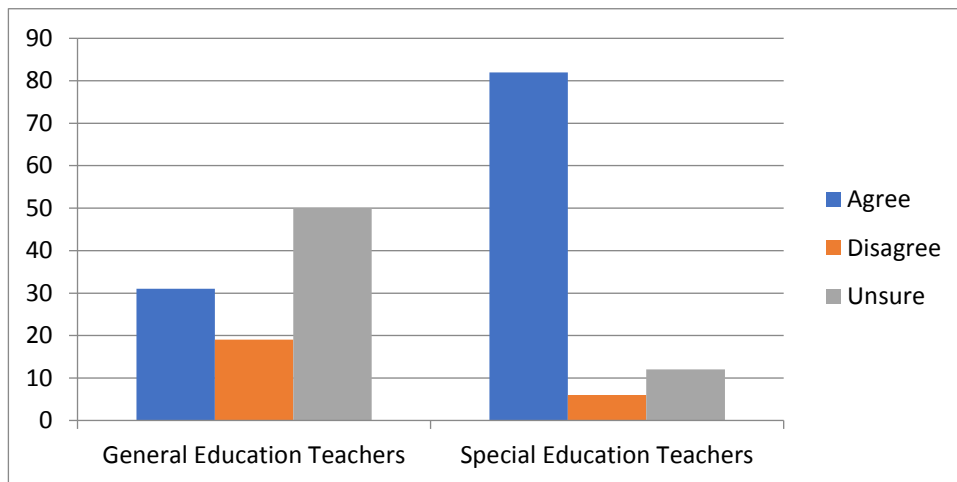


Figure 11. I incorporate UDL into my lessons breakdown. This figure shows the breakdown of responses of General Education and Special Education teachers (in percentages).

The results for this statement are very similar to the last one. Far more special educators claim to incorporate UDL into their lessons; 82% agreed with the statement. Again, the highest response rate for general educators was unsure, at 50%.

Participants were also asked to select the strategies they use regularly in their classrooms that align with the three principles of UDL. The results of their selections for multiple means of representation are listed in table 4, the results of their selections for multiple means of action and expression are listed in table 5, and the results of their selection for multiple means of engagements are listed in table 6.

Table 4

Summary of Responses to Strategies for Multiple Means of Representation

Category	n (%)
Multiple forms to display information	21 (64)
Varied instructional materials	21 (64)
Supports	18 (55)
Examples and non-examples to develop patterns and concepts	17 (52)
Visual media	17 (52)
Use of cues and prompts to draw attention to critical features	17 (52)
Teach background information before lessons	16 (49)
Help students connect what they are learning to what they already know	14 (42)
Auditory media	10 (30)
Multiple views or print formats	7 (21)
Make explicit cross-curricular connections	6 (18)

NOTE: Percentages do not add to 100 due to participants selecting up to 5

There were 11 choices for multiple means of representation to pick from and participants were asked to select up to 5 they use on a weekly basis. A total of 164 items were selected, meaning not all participants selected 5. The most frequently selected responses were use of multiple forms to display data and varied instructional materials; each was selected 21 times. The top 6 in the chart stand out, as those choices were selected more than 50% of the time. It is important to note that all choices were selected.

Table 5

Summary of Responses to Strategies for Multiple Means of Action and Expression

Category	n (%)
Prompts to "stop and think" before acting	20 (61)
Tasks or activities are differentiated	20 (61)
Present different approaches, strategies, or skills that have the same outcome	20(61)
Use multiple tools for construction/composition	19 (58)
Use of supports and scaffolds to express student understanding	17 (52)
Vary the methods for student response	16(49)
Assignments use multiple medias/ formats	10 (30)
Assessments use multiple medias/ format	9 (27)
Optimize access to tools and assistive technology	9 (27)
Build fluency through graduated levels of supports for practice and performance	6 (18)

NOTE: Percentages do not add to 100 due to participants selecting up to 5

There were 10 choices for multiple means of action and expression to choose from. A total of 146 items were selected, meaning not every teacher selected 5. The top three in the chart

were selected 20 times, and 6 of the 10 choices were selected more than 50% of the time. It is also important to note again that all choices were selected.

Table 6

Summary of Responses to Strategies for Multiple Means of Engagement

Category	n (%)
Individualized feedback to support student learning	24 (73)
Assignments have varied levels of challenge	23 (67)
Opportunities to share and demonstrate their learning	20 (61)
Activities allow for active participation, exploration and experimentation.	18 (55)
Student choice of flexible work groups	14 (42)
Tasks are related to student interest	13 (39)
Students have choice in which resources to use	11 (33)
Students self-monitor the completion of their work	10 (30)
Students have grade guidelines that allow varying levels of proficiency	7 (21)
Student choice of activities to use to demonstrate their learning	5 (15)
Student choice in tools	4 (12)
Student choice in content	3 (9)

NOTE: Percentages do not add to 100 due to participants selecting up to 5

There were 12 choices for multiple means of engagement to choose from. A total of 152 items were selected, meaning not every teacher selected 5. The two most frequently selected were individualized feedback and varied levels of challenge for assignments. Only 4 of these 12 choices were selected more than 50% of the time. Again, all choices were selected.

Chapter Summary

This chapter contains the results of thirty teachers' knowledge and use of UDL. Of the 33 participants, 16 were general education teachers and 17 were special education teachers. The majority (91%) of these teachers taught at the high school level. The subjects these participants taught varied, but the most common was math (76%). Overall, the participants average 9.06 years teaching with a standard deviation of 6.23.

Tables and figures were used to show the participants' level of agreement with use and knowledge of UDL statements and questions. In regards to knowledge of UDL, 55% of participants claim to be familiar with the term UDL, with 70% of those being special education teachers. Overall, the data shows that most teachers have not had any training on UDL. Only 30% of participants claimed to have had professional development on UDL and only 30% claimed to have had pre-service training on UDL. The majority of those respondents were special education teachers. To further examine the participants' knowledge of UDL, they were asked to identify the 3 principles of UDL. Only 4 participants correctly identified all 3, and they were all general education teachers.

In regards to use of UDL, 55% of teachers claim to use UDL in their classroom regularly and 58% of teachers claim to incorporate UDL into their lessons. Again, the majority of participants that agreed with these statements in the survey were special education teachers.

Finally, the teachers were asked to select the strategies they use in class. The data shows that the teachers are using a wide variety of strategies that align with UDL. All of the choices were selected multiple times, showing that the participants are incorporating these strategies on weekly basis.

Chapter V

Discussion and Conclusion

The U.S. Department of Education (2016) informs that over 60% of students with disabilities spend 80% or more of their school day in general education classrooms and research shows that teacher quality contributes to achievement by students more than any other factor (Kloo & Zigmond, 2008). 24 of the 33 respondents to this survey instruct students with disabilities, yet only about half claim to be familiar with the term and very few have had training on it. Throughout the knowledge and use questions, the majority of positive responses were from special education teachers yet 44% of the general education teacher participants also instruct students with disabilities. Lowry et al (2017) found varied understanding and implementation of inclusive education and UDL, as did this study when the data was further analyzed. Regardless of the lack of teacher knowledge of UDL, all participants claim to utilize a variety of instructional strategies that align with the UDL principles and guidelines. This allows us to consider how the participants' curriculum, lesson planning, and instructional methods can be further developed with teacher training in UDL.

Discussion

Very few participants have been formally trained on UDL causing a lack of understanding of UDL and varied results. In regards to knowledge of UDL, 55% claim to have knowledge of UDL, but only 30% stated they had any training on it. How are these participants without training familiar with UDL? Significantly more special education teachers than general education teachers claimed to be familiar and have some sort of training on UDL, yet the 4 participants that correctly answered the more in-depth knowledge assessment question of identifying the correct principles of UDL were all general education teachers. How were these

general education teachers without training and familiarity of UDL able to correctly identify the principles? Why do special educators not know and understand the principles of UDL when UDL it is the basis for accommodations and modifications? In regards to use of UDL, 76% of special education teachers state they utilize UDL in their classroom regularly and 82% of special education teachers state they incorporate UDL into their lesson breakdown, yet only 71% of those teachers claim to be familiar with UDL. How do 82% use UDL if only 71% are familiar with it? These concerns show the variability within the data, just as it emerged in the study by Lowry.

Conclusion

This study shows a lack of training of current teachers in UDL. Canter et al (2017) claims a school system and environment that utilized UDL meets the needs of inclusion classrooms and diverse learners, however, only 55% of participants claim to be familiar with the term. Kloo and Zigmond (2008) inform that highly qualified teachers increase student performance more than any other factor, yet only 30% of the participants claim to have professional development on UDL and only 30% claim to have pre-service training on UDL. The majority of those respondents were special education teachers, yet 44% of the general education teachers that participated in the survey also instruct students with disabilities.

Less than 60% of teachers claimed to incorporate UDL into their lesson plans, yet every participant selected UDL aligned strategies claiming to use them on a regular, weekly basis. There were a total of 33 strategies, and all strategies were selected several times. Teachers are regularly incorporating strategies that are considered the “guidelines to UDL” without understanding what UDL is. Based on this data, it is unclear if teachers are utilizing these

strategies in a proactive way in which they intentionally design the curriculum according to UDL so that it builds in these supports to engage and reach individual learners.

Educational Implications

This data shows that there is a need to train today's teachers in UDL. They are already using a wide variety of the recommended strategies, without knowing it is UDL. If they were trained, imagine their lesson planning and the advancement of their instructional skills. Both general and special education teacher participants teach diverse groups, in all types of classes. If they had professional development on how to incorporate the principles, critical elements, and goals of UDL they would, as Johnson-Harris and Mundschenk (2014) state, provide effective instruction for all learners in feasible and functional ways through designing lessons rather than adding modifications later.

Recommendations for Further Research

A possible recommendation for further research would be to broaden the participant pool in order to get feedback that can be generalized. The majority of participants are employed in a High School Math department, so they have had similar training, professional development, and strategy instruction.

Additionally, it would be more difficult but beneficial to have open-ended questions for the participants to expand upon their answers in the use section of the survey. This will allow for a better understanding of how teachers are incorporating UDL into their lessons, how they are utilizing it in their classroom, and how they design and plan their curriculum to regularly use the strategies they selected.

Summary

The traditional one-size-fits-all teaching approach does not meet the needs of today's inclusive classrooms that have such diverse learners. Universal Design for Learning (UDL) has gained attention as a method that embraces individuality; it considers student diversity the most important factor and supports their needs with flexible and accommodating curriculum design (Strangeman et al., 2006). Research shows the numerous benefits a UDL curriculum can have; the teacher's beliefs and roles, the instructional planning, design, and activities, and the students' social and academic skills all benefited in a variety of positive ways due to the change in curriculum in the study conducted by Dymond et al. (2006).

The purpose of this study was to investigate current teachers' knowledge and use of UDL. Current licensed special education teacher and general education teachers in various grade levels, subjects, and classroom types in the Chicago metropolitan area were asked demographic questions, knowledge of UDL questions, and use of UDL questions. 33 teachers participated in a survey; 16 were general education teachers and 17 were special education teachers. The majority of these teachers were high school math teachers.

The results show that about half of the teachers are familiar with the term UDL but very few teachers have been formally trained on UDL. Overall, significantly less general education teacher participants claim to be familiar with UDL, have had training on UDL, utilize UDL in the classroom, and incorporate UDL in their lessons when compared to the special education teacher participant responses.

Each participant selected various strategies that they claim to use on a regular, weekly basis in their classroom that align with the UDL guidelines, though. This raises the question of if they are utilizing UDL without knowing it, or if it can be considered UDL if they are not trained

in UDL. It also brings up the consideration of how these teachers could be better prepared to implement these strategies. If these teachers are formally trained on UDL, they could advance their abilities in curriculum design and instructional approaches. The studies by Lowry et al. (2017), Canter et al. (2017), and Dalton et al. (2012) all concluded there is promise that through professional development on UDL professionals in the field can further their skills and abilities to lesson plan and organize instruction to meet all learners.

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Appendix B

Universal Design for Learning Survey

Universal Design for Learning Survey

Current Teaching Position: *

Highest Degree Earned: *

I have a: *

Type(s) of classroom(s) you teach in: *

- General Education Classroom
- Co-taught Classroom
- Self-contained Classroom
- Resource Classroom
- Other:

Grade level you currently teach: *

- Pre-School
- Middle School
- Junior High
- High School
- Post-secondary School
- Other:

How many years have you taught? (Round to the nearest year) *

Subject area(s) you currently teach: *

- English
- ELA/Reading
- Math
- Science
- Social Studies/ History
- Vocational
- PE
- Other:

I utilize universal design for learning in my classroom regularly. *

- Strongly agree
- Agree
- Unsure
- Disagree

- Strongly Disagree

What are some strategies you use to offer learners various ways of acquiring information and knowledge? Select the top 5 you use the weekly (you may select less than 5 if they do not apply) *

- Examples and non-examples to develop patterns and concepts
- Multiple forms to display information (e.g., text, illustrations, charts, diagrams)
- Varied instructional materials (e.g., text, video, graphics)
- Supports (e.g., outlines, graphic organizers, concept maps)
- Auditory media (e.g., digital, MPS, books on tape)
- Visual media (e.g., video clips, you-tube, animations, diagrams, charts)
- Multiple views or print formats (e.g., changing size of text or image)
- Teach background information before lessons (e.g., pre teach vocab and concepts)
- Help students connect what they are learning to what they already know (e.g., KWL, anticipation guides)
- Make explicit cross-curricular connections (e.g., teaching literacy strategies in social studies)
- Use of cues and prompts to draw attention to critical features

What are some strategies you use to allow students to express what they know? Select the top 5 you use the weekly (you may select less than 5 if they do not apply) *

- Vary the methods for student response (e.g., text, speech, drawing, manipulatives, video, storyboards)
- Optimize access to tools and assistive technology
- Assignments use multiple medias/ formats (e.g., text, speech, drawing)
- Use multiple tools for construction/composition (e.g., spell check, text-to-speech, calculators, graph paper, sentence starters)
- Build fluency through graduated levels of supports for practice and performance
- Present different approaches, strategies, or skills that have the same outcome
- Use of supports and scaffolds to express student understanding (e.g., drawings, manipulatives)
- Assessments use multiple medias/ format (e.g., text, speech, drawing)
- Prompts to "stop and think" before acting
- Tasks or activities are differentiated

What are some strategies you use to engage students? Select the top 5 you use the weekly (you may select less than 5 if they do not apply) *

- Tasks are related to student interest
- Assignments have varied levels of challenge (e.g. differentiated)
- Students have choice in which resources to use (e.g., graphic organizers, outline templates)
- Students have grade guidelines that allow them to complete assignments at varying levels of proficiency (e.g., scoring rubric)
- Individualized feedback to support student learning
- Opportunities to share and demonstrate their learning (e.g., explain their answers to others,

share problem solving skills)

- Student choice of flexible work groups (e.g., individual, pairs, small group)
- Student choice of activities to demonstrate their learning , as opposed to offering one activity that all students must use.
- Student choice in content (e.g., book to read, report topic)
- Student choice in tools (e.g., by hand or with computer)
- Students self monitor the completion of their work (e.g., homework grade tracker, planner)
- Activities allow for active participation, exploration and experimentation.

Rate your level of agreement: I am familiar with the term Universal Design for Learning. *

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Rate your level of agreement: I incorporate Universal Design for Learning into my lessons. *

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Rate your level of agreement: I have had professional development on Universal Design for Learning.*

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Rate your level of agreement: I have had pre-service training/education on Universal Design for Learning.*

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Identify the 3 principals of Universal Design for Learning. *

- Multiple Means of Differentiation
- Multiple Means of Representation
- Multiple Means of Action and Expression

- Multiple Means of Assessment
 - Multiple Means of Engagement
 - Multiple Means of Assistive Technology
-

NOTE: The survey was originally formatted in Google Forms, this is a copy