

The Use of Universal Design for Learning to Meet the Needs of Diverse Students

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Abstract

Teachers today have a broad range of learners in their classrooms that they need to support and traditional instructions are not relevant to address the diverse needs of students. Universal Design for Learning (UDL) framework has been suggested as an effective teaching strategy to support diverse learners. This study investigated the experience of teachers using strategies that align with UDL, their familiarity with this framework, and how they implemented instructional strategies and technologies that align with UDL in a Kazakhstani school. An interpretative qualitative case study with a sample of eight primary teachers was conducted in an International school. Data collection incorporated semi-structured interviews to examine the instructional strategies and technologies teachers implemented. According to the findings, teachers accommodate a range of learners in their classrooms. Teachers do not have a high level of knowledge about the theory of UDL. However, they actively use the strategies that align with the principles of this theory.

These findings suggest that teachers use a variety of media and visual materials to present a new concept. The main aspect of the finding was the role of assessment and observation at the beginning of the year to know the students' abilities, interests, strengths, and needs. The main strategy used was to support students' expression was the use of rubrics that help students to self-monitor, as well as providing students with options and organizing a peer-support program for classroom engagement. Teachers in this study used technologies very often to support their instructions when they present information (video, presentation, smart boards,) rather than providing students with access to the curriculum. The lack of awareness of UDL theory indicates that professional training for teachers was needed.

Keywords: diverse students, inclusive education, technologies in teaching, UDL, zone of proximal development.

Использование Универсального Дизайна Обучения для удовлетворения разных
потребностей всех групп учащихся

Абстракт

В сегодняшнее время преподаватели включают широкий спектр учеников в своих классах, которых они должны поддерживать и традиционные методы преподавания неактуальны, чтобы направлять разнообразные потребности учащихся. Универсальный Дизайн для Обучения был предложен в качестве эффективной стратегии обучения для поддержки различных учащихся. В этом исследовании изучался опыт учителей, использующих стратегии, которые соответствуют УДО, их знакомство с этой структурой и то, как они применяли учебные стратегии и технологии, которые соответствуют УДО в Казахстанской школе. Качественное тематическое исследование с выборкой из восемь учителей начальных классов было проведено в международной школе. Сбор данных включал в себя полуструктурированные интервью для изучения учебных стратегий и технологий, реализованных учителями. Согласно полученным данным, учителя размещают учащихся с различными потребностями в своих классах. Преподаватели не имеют высокого уровня знаний о теории УДО. Тем не менее, они активно используют стратегии, которые соответствуют принципам этой теории.

Эти результаты показывают, что учителя используют разнообразные средства медиа и визуальные материалы, чтобы представить новый материал. Главным аспектом открытия была роль оценки и наблюдения в начале года, чтобы узнать способности, интересы, сильные стороны и потребности учащихся. Основной стратегией, которая использовалась для поддержки самовыражения учащихся, было использование рубрик,

которые помогают студентам самостоятельно контролировать, а также предоставление студентам выбора задания и организация программы поддержки сверстников для активного участия в классе. Учителя в этом исследовании очень часто используют технологии для поддержки преподавания, чтоб демонстрировать информацию (видео, презентации, «умные доски»), но не для того, чтобы предоставлять учащимся доступ к учебной программе. Недостаточная осведомленность о теории УДО указывает на необходимость профессиональной подготовки учителей.

Ключевые слова: ученики с различными потребностями, инклюзивное образование, технологии в обучении, Универсальный Дизайн Обучения, зона ближайшего развития.

Әртүрлі мүмкіндіктерге ие оқушылардың қажеттіліктеріне сай Оқытуда Әмбебап

Дизайнын қолдану

Аңдатпа

Қазіргі таңда мұғалімдер өз сыныптарында көмек қажет ететін алуан түрлі оқушылары бар және дәстүрлі нұсқаулықтарды оқушылардың түрлі ерекшеліктеріне қолдануда жарамсыз. Оқудың Әмбебап Дизайны құрылымы осы әртүрлі оқушыларға қолдау көрсету үшін ұсынылған тиімді оқыту әдісі болып табылады. Осы зерттеу жұмысы ОӘД сай стратегияларды қолданылатын мұғалім тәжірибесін, олардың осы құрылымды қаншалықты білетінін, және ОӘД сай нұсқаулық стратегиялары мен технологияларын Қазақстан мектептерінде қалай жүзеге асыратынын зерттеді. Осы зерттеу жұмысы Сапалық Кейс-стадди әдісі мен сегіз бастауыш сынып мұғалімі үлгісімен Интернационалды мектепте жүргізілді. Мұғалімдердің нұсқаулық стратегиялары мен технологияларды қолдануы зерттеуде деректерді жинақтау жартылай-құрылымдық сұхбаттар негізінде жүргізілді. Зерттеу нәтижесінде, мұғалімдер сыныптарда түрлі оқушыларды қамтиды. Мұғалімдер ОӘД теориясы жайлы білімдері айтарлықтай жоғары емес. Алайда, олар ОӘД заңдылықтарына сай нұсқаулықтарды белсенді қолданатынын анықталды. Осы анықталған нәтижелер жаңа ұғыммен таныстыруда көрнекілік құралдар мен түрлі медиа жабдықтарын қолдануын ұсынады. Зерттеу нәтижесінің негізгі аспектісі болып жыл басындағы оқушының жеке қажеттіліктері, күші, қызығушылығы мен қабілеттерін байқау мен анықтау рөлі болып табылады. Оқушылардың мәнерлі сөйлеуіне қолдау көрсететін басты стратегия ретінде сыныпта белсенді жұмыс жасауда өзін-өзі бақылау нұсқаулығымен қатар оқушылардың өзіндік таңдау жасау, жұппен жұмыс жасау болып анықталды. Бұл зерттеу жұмысына қатысқан мұғалімдер негізінен ОӘД

стратегияларын оқуды көрсету немесе оқыту мазмұнымен таныстыруға қарағанда мағлұмат беруде (видео, презентациялар, ақылды тақта) қолданады. Ал ОӘД теориясын жеткілікті білмеу мұғалімдерге кәсіби тренингтердің қажеттілігін білдіреді.

Кілт сөздер: алуан түрлі оқушылар, инклюзивті білім беру, оқытудағы технология, Оқудың Әмбебап Дизайны, проксималды даму аймағы.

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Chapter 1: Introductory Orientation

Introduction

The aim of this study is to explore teachers' experience of using Universal Design for Learning framework to meet the needs of diverse learners in a selected primary school in Kazakhstan. This study also aims to identify teachers' familiarity with UDL theory and how they implement it in Kazakhstani context. This part contains several key sections. Firstly, the background section of the study is reviewed. It is followed by the research questions. Next, the purpose and objectives of the study are outlined. Then it is followed by the discussion of the statement of the problem. This chapter concludes by highlighting the significance of the study and presenting the outline of the thesis.

1.2 Background

Kazakhstan is actively moving towards implementing inclusion in educational organizations starting from kindergartens to colleges and universities. The country ratified many world documents as *The Salamanca Statement* (UNESCO, 1994), *United Nations Convention on the Rights of Persons with Disabilities* (2006), Further, Article 30 of the Constitution of the Republic of Kazakhstan (1995) guarantees all children equal rights to education. As a result, the country has established a state program for education development for 2016- 2019 (SPED) where one of the target indicators is to increase the percentage of school organizations with favorable conditions for inclusive education up to 70% by 2020 (Ministry of Education and Science, 2016).

Universal Design for Learning (UDL) is an instructional model that has been recommended as an approach to support schools and educators in structuring educational programs that help all learners become increasingly effective students. UDL is a curricular system that focuses on proactive, premeditated lesson activities intending to respond to the needs of all learners found in the classroom (Meier, 2013). In addition to the framework, states that there are three main principles that support the implementation of UDL, namely, “multiple means of representation (e.g., presenting lessons using a variety of materials), multiple means of expression (e.g., allowing students to demonstrate learning in multiple ways), and multiple means of engagement (e.g., using multiple strategies to engage learners)” (Meier, 2013, p. 13). Thus UDL acknowledges that students learn in different ways for various reasons and have numerous methods for demonstrating that learning, while likewise perceiving that most learners will eventually meet a barrier to learning. The UDL admits that students should not be limited with basic instruction in learning, but rather use a variety of strategies that will suit all (Rose & Meyer, 2002).

Madaus, Kowitz & Lalor, (as cited in Meier, 2013) define the “Universal Design for Learning (UDL) 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” (Meier, 2013, p. 12). Therefore, in order to examine UDL practice in Kazakhstani context, the following research statement was stated.

1.3 Problem Statement

Today students come to the school with individual educational needs. The number of students with learning differences and disabilities is increasing and being learned in mainstream classrooms and new policies are considering schools responsible for the academic and social advancements of all learners. Which is evident in the law of the Republic of Kazakhstan “on education” (Ministry of Education and Science, 2007) to ensure quality and access to all levels of education for the population, taking into account intellectual, psycho-physiological and individual characteristics. According to the State Program on the development of education for 2011-2020 and 2016-2019, the number of schools which would have implemented inclusive education will be 70% of the total by 2020 (Ministry of Education and Science, 2010).

Therefore, despite positive changes, there are a number of difficulties in implementing inclusion in schools. One of which is insufficient professional readiness of personnel (Zhetpisbayeva & Zhetpisbayeva, 2017). Consequently, teachers are challenged to accommodate students in the diverse environment and also the typical curriculum is not relevant for all students it might be filled with barriers and other obstacles and has minimal supports for students (Zhetpisbayeva & Zhetpisbayeva, 2017). However, there are so many strategies and approaches are used in mainstream classrooms to support the diversity of the students. Consequently, a new pedagogical approach, Universal Design for Learning (UDL) has been introduced to Kazakhstani context to provide support to schools and educators to design the curriculum for addressing the learning needs of all students

Without diminishing the significance of the above difficulties, scientists believe that the primary and most important stage in the implementation of the inclusion process is the stage of psychological changes and the level of professional competence of its specialists (Zhetpisbayeva & Zhetpisbayeva, 2017). There is an acute problem of professional, psychological and

methodological preparation of all specialists of secondary and primary schools to work with children with disabilities, there is a lack of special competences of teachers in an inclusive educational environment, as well as the presence of psychological barriers and professional stereotypes of teachers (Zhetpisbayeva & Zhetpisbayeva, 2017). There is a need to explore the experience of the teacher in an international school in Nur-Sultan, that addressing the needs of diverse students and know do they aware of UDL theory and do they use the teaching strategies that align with UDL theory. The study, therefore, poses the following research questions:

1.4 Research Questions

The study presents the following overarching research question:

What are teacher experiences in using UDL as a learner support strategy?

To address the main question the following sub-questions were posed:

To be answered through literature review

What do we know about UDL framework?

In what ways has UDL been used to support student learning in inclusive classrooms?

To be answered through an empirical study

How can UDL be integrated into teaching of inclusive learners in a Kazakhstani classroom context?

1.5 Aim and Objectives of the Study

Therefore to answer this research questions the following purpose of the study which was to determine the teacher experiences of using UDL to support students' learning was stated.

Therefore, this study aimed to achieve the following objectives:

- Through literature review, discuss and describe UDL.
- Through literature review identify a different way in which UDL has been used to support learning in an inclusive classroom.
- Through empirical study investigate how UDL could be integrated into the teaching of an inclusive learner in a Kazakhstani classroom context.

1.6 Significance of the Study

In this study, UDL as an alternative approach to pedagogy that solves the challenges of education will be explored and investigated. The idea of Universal Design for Learning recommends that an educational program should incorporate options to make it available and relevant for students with various background, learning styles, and abilities in the learning environment.

The previous research studies in the field of UDL were assessing the effectiveness of UDL theory in K12 setting, also were including the challenges of UDL. Those studies were with a quantitative approach, however, my study focuses on UDL in Kazakhstani context, that was not previously explored. Moreover, this study explores the essence of pedagogical practices and strategies for addressing the needs of diverse learners in an international school and it examines through the lens of the qualitative study. This study suggests important practical recommendations and helpful strategies for the primary teachers in general as well as inclusive education. In terms of the policy, it can be reviewed to bring up the issue of the requirement for pre-service and in-service education in relation to teaching diverse learners. This study helped me to achieve a good understanding of the nature of research and advance my basic skills of conducting the research studies. Finally, it may contribute as a literature to the research for further investigation.

1.7 Definition of Terms

To provide the readers with a clear understanding of leading terms through the study, it is very important, to begin with defining the key terms based on literature.

“Inclusive Education – Inclusive education refers to securing and guaranteeing the right of all children to access, presence, participation, and success in their local regular school. Inclusive education calls upon neighborhood schools to build their capacity to eliminate barriers to access, presence, participation, and achievement in order to be able to provide excellent educational experiences and outcomes for all children and young people” (Slee, 2018, p. 7).

“Learning needs – Needs which comprise both essential learning tools (such as literacy, oral expression, numeracy, and problem solving) and the basic learning content (such as knowledge, skills, values, and attitudes) required by human beings to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions, and to continue learning. The scope of basic learning needs and how they should be met varies with individual countries and cultures, and inevitably, changes with the passage of time” (UNESCO, 1992, para 1).

“Universal design – The process of creating products that are usable by people with the widest possible range of abilities, operating within the widest possible range of situations; whereas accessibility primarily refers to design for people with disabilities” (Henry, Abou-Zahra, & Brewer, 2014, p.17).

1.8 Outline of the thesis

Chapter 1 Introductory orientation: The introductory part of the paper offers general information about the educational policy of Kazakhstan. This chapter presents the purpose of the study,

research question, statement of the problem and it presents information about the significance of the study.

Chapter 2 Literature Review: The literature review provides information about the theoretical framework of Vygotsky. Since the topic of the thesis is connected with exploring the usage of Universal Design for Learning approach in inclusive classrooms it is important first to give a definition of this theory, its background, and explanation its connection with sociocultural theory.

Chapter 3 Research Methodology: This section of the paper includes the description of the applied research paradigm through which this study was realized. Also, it contains the information about the research approach; explains the research tool, selection of participants and cite in order to answer the research questions.

Chapter 4 Analysis and Results: This section provides the reports on data analysis and also presents interpretations of the interviews. The data emerged from the interviews is divided into four themes. The themes are justified by the excerpts from interviews and further, they demonstrate the interconnection between the different sources of data.

Chapter 5 Discussion of findings: This chapter starts by restating the research aims, research questions and the objectives of the study. Furthermore, the findings are discussed in relation to the literature presented in chapter 2 in order to indicate whether the study has found new knowledge.

Chapter 6 Conclusions and Recommendation: This chapter provides a conclusion based on discussions and recommendation for different stakeholders. The limitations and the areas for further research were discussed and the chapter concluded the study.

Chapter 2: Literature Review

2.1 Introduction

The purpose of this chapter is to describe the Universal Design for Learning (UDL) framework and identify different ways in which UDL has been used to support learning in inclusive classrooms. The literature regarding Universal Design for Learning and Sociocultural learning will be explored. Theoretical background will be examined through the insight from current and past research studies.

2.2 Theoretical Framework

In order to understand how to use the Universal Design for Learning (UDL) framework improves teaching guidance it is critical to examine the theoretical and empirical literature. Firstly, the sociocultural part of learning will be investigated that explains the pedagogical concept of teaching and learning. Secondly, it will be followed by the description UDL structure that can be implemented and defined in which way it may bring positive changes into teaching. Next, the literature about UDL studies will be discussed. Finally, this chapter will be concluded by investigating the role of technology and how it can support UDL instructional practices. This chapter will conclude with an explanation of the purpose of this study.

2.2.1 Traditional Learning versus UDL

Pedagogical models of teaching and learning are a basis for designing instructional curricula and pedagogy. A pedagogical model is crucial to curriculum design and transfer

effectiveness because it determines the way the content is taught in schools as well as time and reasons for it (Meier, 2013).

A teacher is viewed as the dispenser of knowledge in a pedagogical model which is frequently guided classroom instruction. Often it referred to transmissive instruction in this traditional model of instruction (Jonassen & Land, 2000), learning occurs when a teacher transmits knowledge to the student. In this transmissive model of pedagogy, learning is believed to be improved by clear and effective communication of ideas to the ‘receiver’ (learner) (Wertsch, 1991). “This can be achieved by improving the clarity and accuracy of the teacher’s message” (Meier, 2013, p. 18). It is assumed that students will comprehend the knowledge as well as their teachers if they will succeed in transmitting what they know. Therefore, according to this assumption good teaching outcome equals effective communication, and teaching is seen as a mechanism of transferring information to learners (Jonassen & Land, 2000). This model of teaching presents the knowledge as a phenomenon to be passed on between people, and when students apply the information and handle rules of the classroom it means learning is achieved (Wertsch, 1991). As opposed to the transmissive model, the Universal Design for Learning (UDL) model moves a teacher to a guiding and supporting position, and learning process are based on the concept of conveying the meaning and not only communicating (Meo, 2008). Sociocultural theorists take up an idea of learning as a social activity where knowledge is established via communication alternatively to an isolated individual activity.

Sociocultural theory determines to learn as a social activity that better for students rather than passive learning where knowledge transfers from one individual to another. Active learning is confirmed by the studies of Vygotsky, who argued that learning is when knowledge is acquired and developed through social activity, that is, by interacting with others (Vygotsky

1978; Wertsch, 1991). It is therefore important to draw some parallels between the social aspect of learning and UDL.

2.2.2 Sociocultural Theory

Based on the recent study of Rogoff (as cited in Meier, 2003) sociocultural learning derives from the theory of culture and language contribution to human development, meaning that learning is mediated by cultural and linguistic artifacts. Proponents of sociocultural theory believe that learning essentially encloses cultural components and tools, and becomes a part of varieties of social activities. Furthermore, sociocultural theory eliminates the concept of competence being an individual identity, taking into account the developing student's competence through social context (Meier, 2013).

Vygotsky- the founder of sociocultural theory, a child's cognitive development was promoted systematically and purposefully by adults. It means involving children in activities that are meaningful in a free environment that is full of natural conversation and interaction occur (Meier, 2013).

Transmissive instruction sees the learning as teachers' interaction with students through information, whereas the sociocultural model of learning implies interaction at a meta-cognitive level, which is promoting thinking through a problem, then receiving teacher's response by the learner (Grabinger, Aplin, & Ponnappa-Brenner, 2007).

The essential path of learning starts with taking part in mediated interactions with adults state Palinscar, Brown, Rogoff, Vygotsky, Wertsch (as cited in Meier, 2013). While performing cognitive activities adults set up an example by modeling and thinking-aloud. The adult starts to gradually increase the responsibility for the talk and cognitive activity but still assists in student's

performance when needed. Consequently, in this context, general and situated nature of the structure of the knowledge is maintained (Kumpulainen & Wray, 2002). By sociocultural approach learning requires social interaction (i.e., discourse) where learners' knowledge is based on participation in mediated activities with other people, therefore learning is not a passive activity (Nieto, 1992).

2.2.3 Components of the Sociocultural Theory

There are several components of sociocultural theory, which allows teachers to properly support the student at a certain stage of development or when the cognitive program might be challenging to perform on their own (Meier 2013). He mentioned that “students fall into a continuum, in which at a certain point in time, everyone may need a different amount of support to perform certain aspects of a given cognitive activity” (Meier, 2013:23). In addition, over time, also the level of support that the teacher can provide to the student may vary and in the future it may not be required (for instance, when a student becomes more knowledgeable, he can help peers who need help, so he can master his skills by revising and provide support to peers). This period when a student needs help in academic program Vygotsky (1978) calls the zone of proximal development (ZPD).

The word proximal means nearby. Vygotsky claimed that at any period of time some tasks beyond the ability of the child. The child is close to advance the cognitive skills to complete the task, but he can have difficulty coping with the task alone. However, during this period, children can show rapid progress if they work under the supervision of a more experienced partner (Meier, 2013).

The Zone of Proximal Development is the discrepancy between the level of actual development (it is determined by the degree of difficulty of the tasks solved by the child

independently) and the level of potential development (which the child can achieve by solving problems under the guidance of an adult and in collaboration with peers) (Harris & Pressley, 1991). The ZPD is ahead of the actual level of student achievement and is an area of learning sensitivity in which the most important learning takes place (Wertsch, 1988, 1991). It means if the teachers use appropriate strategies like scaffolds, social support, the ZPD is viewed as a learning environment where teachers provide a type of learning support that will take students to the next level of understanding (Meier, 2013).

2.2.4 The Intersection of UDL and Sociocultural Learning

As mentioned earlier, the sociocultural theory originates from a pedagogical model that explains the nature of learning. That learning is not a passive condition of the individual but is an active social atmosphere that has a beneficial effect on effective learning. Thus, this explanation aligns with the principles of UDL (Rueda, Gallego, & Moll, 2000). There is a connection of sociocultural concept with UDL, that lies in relation to the provision of the educational environment, that will reduce some educational barriers and provide full access for students, rather than believing that the learning difficulties consist within the student (e.g., writing on a colorful board will not create barrier for student with dyslexia who struggle with reading).

As was discussed before, UDL has a relationship with sociocultural theory however the zone of proximal development (as a component of sociocultural theory) also is embedded in the Universal Design for Learning (Rose, Meyer, Strangman, & Rappolt, 2002). UDL performs its main principles through the applying of various sociocultural supports as modeling, scaffolds, prompts, mediated learning in order to support and move students to a relevant level of learning (Meece, 2003). Moreover, UDL supporters believe that scaffolding strategy that assists students'

performance can be offered not only through teachers instruction, but also including the provision of technology (Englert, Zhao, Dunsmore, Collings, & Wolbers, 2007). For instance, Okolo (2006), suggests digital media as an effective strategy to use as a means for mediating performance in order to allow students to gain access to information. See Table 1 for definitions and examples of sociocultural supports.

Table 1 Definitions of Sociocultural strategies

Terms	Definitions	Examples
Scaffolding	“It is a process where the more knowledgeable and experienced individual provides clear guidance or structure so that students can complete the task in their zone of proximal development” (Gersten & Clarke, 2007, p. 15).	Graphic organizers, templates, and prompts
Modeling	“A metacognitive process that allows the student to hear their teacher’s thought process about a pattern or concept because the teacher demonstrates the task while simultaneously thinking aloud the process”(Gersten & Clarke, 2007, p. 17).	Teachers verbalize the procedure for long division by thinking aloud as they demonstrate a long division problem for students.

Zone of Proximal Development (ZPD)	The gap between the level of performance achieved by a student working alone, and the level of performance achieved by the student working in collaboration with more knowledgeable others or with the mediational support afforded him/her through the provision of well-designed instructional scaffolds. The ZPD is the area where the most significant learning occurs (Harris & Pressley, 1991; Vygotsky, 1978)	Teachers work in small groups with students to help them complete the steps of mathematic procedures that they are unable to do on their own.
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2.3 Universal Design for Learning

This section of the paper focuses on investigating the UDL origin, it contains information about how UDL was developed. It describes the philosophy of UDL applies in an instructional environment in the classroom and defines the principles of UDL. Also, it concludes by examining how UDL can be implemented in inclusive classrooms.

2.3.1 The Development of UDL

The concept of Universal Design started with the movement in the field of architecture. Universal Design is described by Burgstaller as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (as cited in Meier, 2013, p. 26). Often Universal Design is compared to curb cuts to explain this concept. In the beginning, curb cuts were created for people with physical disabilities, but then people realized curb cuts proved to be useful for all people. Different type

of individuals can benefit from them, as people with strollers, bike riders, and skateboarders (Rose, 2000). When the Americans with Disabilities Act (ADA) passed in 1990, buildings were required to have access for people with limited needs. But later they realized that the concept of designing new buildings with accessibility and facilities for each person can be embedded in education (Hitchcock, 2001).

2.3.2 Universal Design for Learning

Meier (2013), states that universal principles that guided architectural design were the beginning for the educators from Center for Assistive Special Technologies (CAST) to start applying those principles to the design of educational environments.

“In the early 90’s educators at CAST began to recognize that learning materials such as books were analogous to stairs” (stairs were a barrier for people with physical disabilities) (Rose, 2000, p. 57). UDL consolidated the standards of universal design in an instructional paradigm that led to revision ideas of teaching, planning and curriculum were revised. In this paradigm shift, King-Sears (1997) states that attitude about teaching and learning changed in four main ways: (a) teachers begin to treat students with disabilities as equals with all students, rather than as a separate group; (b) adaptation is applied to all students, and not just to learners with disabilities; (c) learning materials are becoming more diverse, extensive, due to the inclusion of diverse resources, both digital and online, instead of one text; and (d) educators improve their instructional goal from a focus on fixing students so that the student can fit into the curriculum and manage it, so that curriculum adjusts to fit the varying learning needs of the student

Implementation of UDL is considered to eliminate barriers for students and advance access to learning as well as curriculum (Meier, 2013).

In order to understand UDL, it needs to be considered in a meaningful way. ‘Universal’ does not mean that one is suitable for everything, most likely a ‘universal design’, as mentioned earlier, about the environment and material. This is something that is used by a wide range of people, and the same meaning in learning, the creation of a flexible learning program, where the student does not have to correct himself to adapt to the program, but rather a flexible program that will include all students (Meier, 2013). In summary, “UDL accentuates the need for inherently flexible and adaptable content, assignments, and activities” (Rose, Sethuraman & Meo, 2000, p. 58). So how barriers in the curriculum can be minimized? Hitchcock (2001), suggests providing various options to access the content (e.g., video, websites, text). Therefore, by arranging the accessible environment and different options to use the content will bring the benefits not only students but also for a teacher in terms of significantly reducing the need of adaptations that teachers need to create. Additionally, it frees them of the need to make accommodations, they can use that time to interact with students.

2.3.3. The UDL Framework

According to Meyer & Rose (2002, p. 40), “UDL consist of three main principles, namely (a) multiple means of representation (i.e., presenting educational materials using multiple instructional methods); (b) multiple means of action and expression (i.e., providing alternative formats for students to demonstrate what they have learned); and (c) multiple means of engagement (i.e., using student’s interests and abilities to inform instruction and increase motivation)”. These three main standards help to limit boundaries and expand learning by commanding an adaptable way to deal with training which supports the learning needs of individual students. Why should the curriculum and learning goal be changed? The main reason is that every student has an individual story, strengths, interests, all these learning differences are

addressed from the onset of instruction (Meece, 2003, p. 111). The implementation of UDL principles in teaching to address various needs of learners will be discussed in the next section.

2.4. UDL Assumptions

In order to respond better to the main principles of UDL, it is important to examine two main hypotheses that is included in the UDL theory. They are flexible teaching goals and design of instruction for providing access to the curriculum (Rose, 2002).

In order to address the principles of UDL, first teachers should develop “clear and concise learning goals for all students” (Meece, 2003, p.112). “UDL emphasizes that all students should have appropriate goals based on their skills, interests, abilities, expertise, and level of progress” (Rose et al., 2000a, p.57). An inflexible goal will never be an adequate UDL goal because it cannot challenge each student to learn as it does not afford multiple options for presentation and performance (Hitchcock & Stahl, 2003). A rigid goal that requires students to demonstrate their learning only in one way might reduce student’ academic performance. “It does not challenge each student to learn because it does not recognize that there are many ways of achieving and demonstrating the instructional goal”. However, in contrast, a teacher who has set the clear goal can develop various means to provide flexible instruction and support to help each student reach the goal (subtraction and regrouping accuracy) without undermining the challenge of learning (Hitchcock, 2001, p.25).

2.5 Three Principles of UDL

Once this study discussed about benefits, importance of developing flexible goals, and the need to implement universal design to access *learning* the curriculum, teachers can feel prepared to design curricular activities that incorporate the three instructional principles of UDL, namely: (a) multiple means of representation; (b) multiple means of action and expression; and (c)

multiple means of engagement (Meece, 2003). However, there are additional components that are relevant to each principle. This section of the paper will demonstrate the components of the UDL principles. To examine the UDL Principles and their components (see Table 2).

Table 2 UDL Principles 1, 2, 3 and

Components UDL

Principles	UDL Components
Principle 1: Multiple means of representation	Provide multiple examples Stress/Highlight critical features Supply multiple media and formats Support background knowledge
Principle 2: Multiple means of action and expression	Supply flexible models of skilled performance Provide multiple opportunities to practice with supports Provide ongoing, relevant feedback Offer flexible opportunities for demonstrating skills
Principle 3: Multiple means of engagement	Offer choices of content and tools Provide adjustable levels of challenge Purpose choices of rewards Offer choices of learning context

2.5.1 UDL Principle 1

The first principle of UDL, *multiple means of representation*, focuses on students' ability to learn through recognizing and understanding patterns, information, and concepts (Meyer & Rose, 2000). Instructional strategies to achieve this goal consist of fall four components. See table 3.

Table 3 UDL Principle 1

1. <i>Provide multiple examples.</i>	2. <i>Stress/highlight critical features.</i>	3. <i>Supply multiple media and formats</i>	4. <i>Support background knowledge (Siegel, 1995).</i>
<p>In order to gain an understanding of a new concept, a student should be provided with numerous examples (Meyer & Rose, 2000). To demonstrate the example, a primary student can learn the triangle shape, however, it can be</p>	<p>This second component is reviewed as a modeling strategy, that helps students to hear the thinking process of their teacher (Rose, 2000). It means that students can master their skills due to highlighting the new concepts (Gersten & Clarke,</p>	<p>Gersten, Dimino, & Peterson (2006), explain this component as an offering multiple options to obtain information. Students differ from each other in terms of obtaining information. Some students are visual, others are tactile. In order to respond to all</p>	<p>“The last component is related to the connection of new concepts to basic knowledge. When students learn something new, they should include it in what they already know” (Rose, 2000, p.46). Rose et al. (2002) acknowledge that</p>

<p>hard to remember or understand what triangle is. However, if the student is offered several different sizes of the triangle, different types of a triangle, and letting them to touch by explaining to them that they can be different, students will definitely succeed in this activity (Rose et al., 2002).</p>	<p>2007; Vygotsky, 1978</p>	<p>those diverse learners, teachers must scaffold student learning by using multiple media and formats (Gersten & Clarke, 2007; Okolo, 2006).</p>	<p>many teachers practice these methods in the classroom, but also emphasizes that the use of digital content and flexible teaching tools will expand communication opportunities that support all students in a class more effectively. For example, photographing, or creating video clips can help students establish a link between basic knowledge and new content (Okolo & Ferretti, 1996).</p>
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2.5.2 UDL Principle 2

The second principle of UDL, “*multiple means of action and expression*, addresses the student’s ability to plan, execute, and self-monitor skills and actions” (Rose et al., 2002, p.58).

To respond to student diversity teachers should create the provision students with alternatives for demonstrating their knowledge (Posner & Rothbart, 2004). There are the next four components that support teachers in instructing in table 4.

Table 4 UDL Principle 2

<p>1. “<i>Supply flexible models of skilled performance</i>” (Rose et al., 2000, p.58).</p>	<p>2. “<i>Provide multiple opportunities to practice with supports</i>” (Rose et al., 2002, p.58).</p>	<p>3. “<i>Provide ongoing, relevant feedback</i>” (Rose et al., 2002, p.58).</p>	<p>4. “<i>Offer flexible opportunities for demonstrating skills</i>” (Rose et al., 2002, p.58).</p>
<p>To demonstrate the visible steps of completing the task (Merill, 2002), e.g., thinking-aloud as doing the actions related to each step in a new routine. Furthermore, “when a teacher let students</p>	<p>The complex goals are achieved with the help of additional teacher support, repetition, or separately from the context. For example, if a child learns to read and some sounds are more difficult for</p>	<p>This is the significant component in teaching because a student needs to know if s/he performing effectively, and what to do in a different way if the progress falls (Rose, 2000). Moreover, the</p>	<p>It plays a huge role to provide students with multiple ways to demonstrate their skills (Rose, 2000), e.g., demonstrate how a student completed the mathematical task with power point, other might complete</p>

<p>discuss ideas and find alternative routes to achieving the same goal, an opportunity is created for students to participate in the social construction of knowledge” (Rose et al., 2002, p.58).</p>	<p>him, the teacher may allow the student to work independently with a specific sound to master (Rose et al., 2002).</p>	<p>feedback plays a crucial role when a student at the period of applying to learn in a new situation (Harris & Pressley, 1991; Lenz, 2006; Rose et al., 2002). In addition to this, teachers can provide strategies for students to self-monitor and develop students’ reflexive skills (Meier, 2013).</p>	<p>it in a different way. Johnston (2008), suggests using digital technologies whenever it is possible to expand the ideas. This strategy allows students to connect their gained knowledge with new concepts.</p>
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2.5.3 UDL Principle 3

The third principle of UDL, “multiple means of *engagement*, focuses on the diversity of the effective learning domain. This domain stresses that the level of attention students devote to a learning task or an activity depends on what attracts, motivates, or engages them” (Rose et al., 2002, p.58). Meyer & Rose (2000) share some of the reasons that students do and do not learn:

“Students learn for many reasons, including positive feedback and fascination with the material. The reasons students do not learn include little feedback or encouragement, poor match

with the teaching style, an inappropriate level of challenge, or lack of personal relevance of the material presented” (p. 42).

To respond to the diversity of the students’ effective learning, students should be provided with multiple options for engagement. The following four components help support the third UDL principle, multiple means of engagement demonstrated in table 5.

Table 5 UDL Principle 3

<p>1. <i>“Offer choices of content and tools”</i> (Meyer & Rose, 2000, p. 42).</p>	<p>2. <i>Provide adjustable levels of challenge</i> (D. H. Rose et al., 2002).</p>	<p>3. <i>Propose choices of rewards</i> (D. H. Rose et al., 2002; Williams & Stockdale, 2004).</p>	<p>4. <i>Offer choices of learning context</i> (Clarke & DiMartino, 2004; D. H. Rose et al., 2002; Wright, 2006).</p>
<p>If students are allowed to choose content and tools for work, it can increase their interaction for mastering a skill (Flowerday & Schraw, 2000). As an example of offering an alternative choice</p>	<p>By adjusting the level of challenge, teachers allow students to work in their zone of proximal development (Rogoff, 2003). ZPD is a learning area where students learn best when the difficulty level is</p>	<p>“Offering students a choice of rewards addresses the fact that each student has his or her own idea of what constitutes a reward” (Meyer & Rose, 2000; Rose, 2000, p. 48). While external rewards are often</p>	<p>Meyer & Rose, (2000), declare that a student’s choice of learning context is individual as other learning preferences. For example, some learners prefer to work in small groups, helping each other</p>

<p>of content, students could be allowed to choose what tools to use for improving their reading (quiet zone with books, blocks with letters to construct the word, playing cooking with reading the recipe). All these activities might be interesting and useful to advance a particular skill.</p>	<p>adjusted, so students can practice realistic goal setting. And Rose, Meyer, Strangman & Rappolt (2002) and Harris & Pressley (1991) point out that this also contributes to practicing skills to set a goal.</p>	<p>offered in classes, the UDL emphasizes the importance of internal rewards (Cook, 2003). “Forming a meta-awareness of progress and progress in students — an important UDL principle — can be one of the most effective ways to instill internal interest in learning and support long-term student participation” (Rose et al., 2002, p.58).</p>	<p>and asking questions, while others can work better individually, they like to look for answers by themselves. Similarly, a group of students prefers a lot of structure when they are given a task, while others like a less structured approach. Providing learners with a variety of study materials and varying degrees of structure gives each student the opportunity to choose the learning context that corresponds to his or her specific preferences (Callahan, 1999).</p>
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2.6 Conclusion

This chapter is described as the Universal Design for Learning (UDL) framework and identified different ways in which UDL has been used to support learning in inclusive classrooms. The literature regarding Universal Design for Learning and Sociocultural learning was explored. Theoretical background was examined through the insight from current and past research studies.

Chapter 3: Research Methodology

3.1 Introduction

This chapter discusses the research methodology employed in the study. The discussion begins by highlighting the research design, sampling and data collection instruments. The chapter further addresses the data collection methods used and presents how trustworthiness in this study was maintained.

3.2 Interpretative research paradigm

This study implied the interpretative research paradigm. The main purpose of the Interpretative paradigm is to understand the subjective nature of human experience (Guba & Lincoln, 1989). This approach is used by researchers because it allows making an attempt to withdraw the constructions from the field by studying in depth the phenomenon of interest, it allows to understand and clarify the subject's perspective or the meaning the subject is making of the context (Walsham, 2006). Everything possible is being done to try to understand the point of view of the observed subject and not the point of view of the observer. The emphasis is on understanding the personality and its interpretation of the surrounding world. So the key principle of the Interpretative paradigm is that reality is socially constructed (Biklen, 1992).

3.3 Qualitative research approach

The qualitative approach attempts to understand the research problem or topic from the point of view of the local population with which it is associated (Creswell, 2012). In order to better understand the complex reality of the situation, qualitative method research is used. One of the main qualitative methods is in-depth interviews (Creswell, 2012). In-depth interviews are

optimal in order to collect data on teachers' personal beliefs, opinions, and experiences of using the instructional strategies in a primary setting that align with UDL principles in Kazakhstani context. Data from interviews can have useful recommendations for improvement of inclusive education and uncover issues for further research.

3.4 Case study research design

This research study applied a single case study. "A case study is defined as an investigation to answer specific research questions that are looking for a number of different evidence from a case study" (Gillham, 2000, p.7). Yin (2003) claims that case study as an empirical that is used to explore a current phenomenon in the context of its real life, especially when the boundaries between the phenomenon and the context are not clearly explained. Therefore, in this research, the case has been chosen, because the phenomenon of teachers' experience in the inclusive environment was not clearly defined and the case study design allowed the researcher to explore a case in real life context.

3.5 Research Site and Selection of Participants

3.5.1 Research Site

To address the research questions of the study the research was held in a primary setting in a school of Nur-Sultan city. The school was purposefully selected to answer the research questions in-depth. Technological advancement, accessibility, and presence of the students with special educational needs were criteria for selection of schools.

3.5.2 Selection of Participants

The study was composed of eight teachers. (Creswell, 2012) notes that the dimensions of the qualitative sample should be large enough to obtain enough data to sufficiently describe the phenomenon of interest and answer research questions. Creswell (2012), states that the goal of quality researchers should be to achieve saturation data. Saturation occurs when adding more participants to a study does not lead to additional perspectives or information.

The teachers were selected using purposeful sampling. Purposeful sampling is a non-random sampling method when the searcher selects insightful information cases for in-depth study (Patton, 2002). “Purposeful sampling occurs when the researcher selects a sample from which the most can be learned” (Merriam, 1998, p.55). Therefore, this study involved the participants from primary setting who taught in a diverse environment as well as students with learning needs.

3.6 Data Collection Instruments

The study employed one-on-one interviews with open-ended questions. An interview is defined as a personal conversation between the researcher and the participant, providing for the transfer of information to the interviewer (Creswell, 2012). An interview is a method of collecting primary information in research. An interview occurs one person (interviewer) seeks to obtain information from another (individual or group of certain people) in the context of interaction and answers can be recorded (Creswell, 2012). The interview allowed the researcher to adapt the questions to a particular situation; the possibility of obtaining more in-depth information about interviewers’ experience of instructional practices and their familiarity with UDL.

3.7 Data Collection Process

3.7.1 Gaining access to the research site

I examined how many schools fit the criteria to answer the research questions.

Technological advancement, accessibility, and presence of the students with special educational needs were criteria for selection of schools. Thus, schools that approached the criterion were sent letters of invitation to participate in a research study. After I got the agreement from the administration of the school they were sent the consent form.

3.7.2 Conducting interviews

The interview schedule with open-ended questions was created to help the researcher in order to understand the specific teaching strategies that cover UDL principles and applying technology that teachers actually use in their classroom. Also, questions aimed to gather information about whether teachers had awareness of the UDL framework. Moreover, the interview included questions to know what instructional strategies are used to support students. The interviews were conducted for at least one hour in quiet rooms at the school in English. When interviewing I started with general questions then focused questions according to the interview protocol. The interview was audiotaped for collecting and analyzing the data.

The interview was consisted of six parts to collect information from teachers that started from a general question and revealing the teaching strategies. (See Appendix A for the interview questions).

The interview questions included a section focused on the interviewee's demographics at the classroom level, then part on how primary teachers plan the lesson that responded to the needs of learners was covered. It was following the question about familiarity with UDL theory. Then the question about the implementation of UDL was asked. Also, the interview included

questions about addressing the needs of learners during the classroom and how teachers encourage students' willingness to interact with each other. Then the interview was concluded by asking the questions about technologies role to support the diverse needs of students.

3.8 Data analysis approach

a) Preparing data for analysis

Data was transcribed from audiotaped.

b) Analysis strategy

Data were analyzed using inductive thematic analysis. The following steps were followed in the process of data analysis. To analyze data I followed the next steps:

- Organizing data into an analyzable format
- Reading of Data
- Coding of Data
- Deriving themes from Data

The three UDL principles and Vygotsky's theory of the zone of proximal development (as described in chapter 2) were applied as a theoretical lens on the findings to provide a theoretical base for the study.

3.9 Ethical Consideration

I have followed the guidelines of the NUGSE Ethics Committee and performed all necessary precautions to protect the rights of study participants. As soon as my Ethics Application was approved and got permission from the Nazarbayev University Graduate School of Education (NUGSE) Research Committee, an invitation letter was sent to the administration

of the school. After they accepted the invitation, all primary teachers were sent invitations to participate in the study. Eight potential participants who agreed to participate in the interview were identified. The participants were sent consent forms prior to the interview day to sign. One-on-one interviews were used as an instrument to answer the research question. They have been explained the purpose of the study, asked permission to record the responses. The interviews were conducted in accordance with ethical principles and standards. Their participation in the interview was on a voluntary basis. Their interests were protected and participants were not put at risk. The names of participants were confidential and no names listed in the findings.

The interviews were held at a school in a quiet room where none of the interview participants was disturbed.

3.10 Trustworthiness of the Study

According to Loh (2013), determining the trustworthiness of the study can be an indicator that the data presented in the report are reliable and that the arguments based on the results are convincing. In order to maintain high trustworthiness of the qualitative study, the researcher must ensure that the research is inferior to truth value, applicability, consistency, and neutrality in order to ensure correct interpretation of the data.

3.11 Conclusion

This chapter began with a definition of a qualitative approach and an explanation of why this approach is best suited for this study. Then the research methodology was discussed, which entails: a qualitative approach, research design (case study). Further, the chapter discussed issues of sampling and selection of participants, as well as the site of the study. Qualitative data

collection tools were explained in detail with interview questions. In addition, the chapter discussed the data collection process, which included the research procedure. The chapter focuses on analyzing the data, step by step explaining the whole process. Then, the ethical issues associated with this study were clearly explained to maintain confidence. This chapter explained the ethical considerations that the researcher used to ensure full confidentiality and anonymity of participants. Finally, the chapter focuses on the trustworthiness of the study; define it first, then pay attention to the role of the researcher.

The next chapter focuses on the data analyses and the formulation of themes derived from the interviews.

Chapter 4: Result of Data Analysis

4.1. Introduction

This chapter will discuss the findings derived from the interviews and contains analysis to fulfill the research purpose. Data were analyzed with respect to the research questions:

- to know what experience do teachers have in using UDL as a learner support strategy?
- to explore what do we know about the UDL framework?
- in what ways has UDL been used to support student learning in inclusive classrooms?
- how can UDL be integrated into the teaching of inclusive learners in a Kazakhstani classroom context?

Results for each research question are addressed separately and the analysis is organized based on four themes.

The following themes were derived from data analysis:

- Teachers' experience in Kazakhstan school
- Assessment for learning
- Use of UDL strategies
- Implementation of technology

To begin with, I will present teacher's classroom settings, what range of students they accommodate in their classrooms and what challenges the teachers' face in their practice in Kazakhstan school. Following this theme, I will discuss the role of the assessment to plan the lesson for the diversity of students. After that, the findings show what activities teachers believed to be the most successful for the learners that align with UDL principles. Each of the three principles was applied to address the question that aimed to support teachers in order to improve the skills of presenting information, encourage students to interact, and design inclusive

assessments and evaluations. Finally, I will discuss how participants instruct their teaching methods for diverse learners with the help of technology.

The chapter will discuss each theme in relation to how it helps to answer the research questions as stated in chapter 1. The findings in each theme will be discussed and supported by a direct quote or extract from the data.

4.2. Data Analysis Process

To analyse data I followed the next steps:

- Organizing data into an analyzable format
- Reading of Data
- Coding of Data
- Deriving themes from data

The first step to start coding the data was to transcribe my audio files to a written document. I read through my transcripts, while listening to the recordings to make sure I did not miss any words. I had two highlighters with different colors. One was for the question and the other was for the words or phrases that stand out.

I read through all interviews several times to familiarize myself with the data, took notes on ideas and topics they included. With the objectives and theoretical concept in my mind I read the transcripts again, I was able to pick up interesting and important words, sentences and phrases that I thought were relevant to research questions. Once I finished, I opened a new word document and copied the question in numerical order and the page number.

I coded my data manually, using small cards I designed especially for coding. Using Microsoft words to document and creating the table, where I arranged my data according to the

answers of the interviewers and general talks they provided. I revised the research questions and objectives. That allowed me to build a concrete structure for describing data analysis.

These words and sentences were my initial codes. I created simple word document tables, just to columns, for the participant's name and the codes selected. After getting all initial codes into a simple table, I re-read them several times again and I could identify certain broader themes to fit the initial codes. After doing this to the entire document, I went back and read each word and phrase and wrote the theme. Coding of interview text was broken into four primary themes: (a) teachers' experience in a Kazakhstani school; (b) assessment for learning; (c) UDL principles; (d) implementation of technology in learning. Then I applied the UDL principles how far they have been implemented by teachers (see the figure 1).

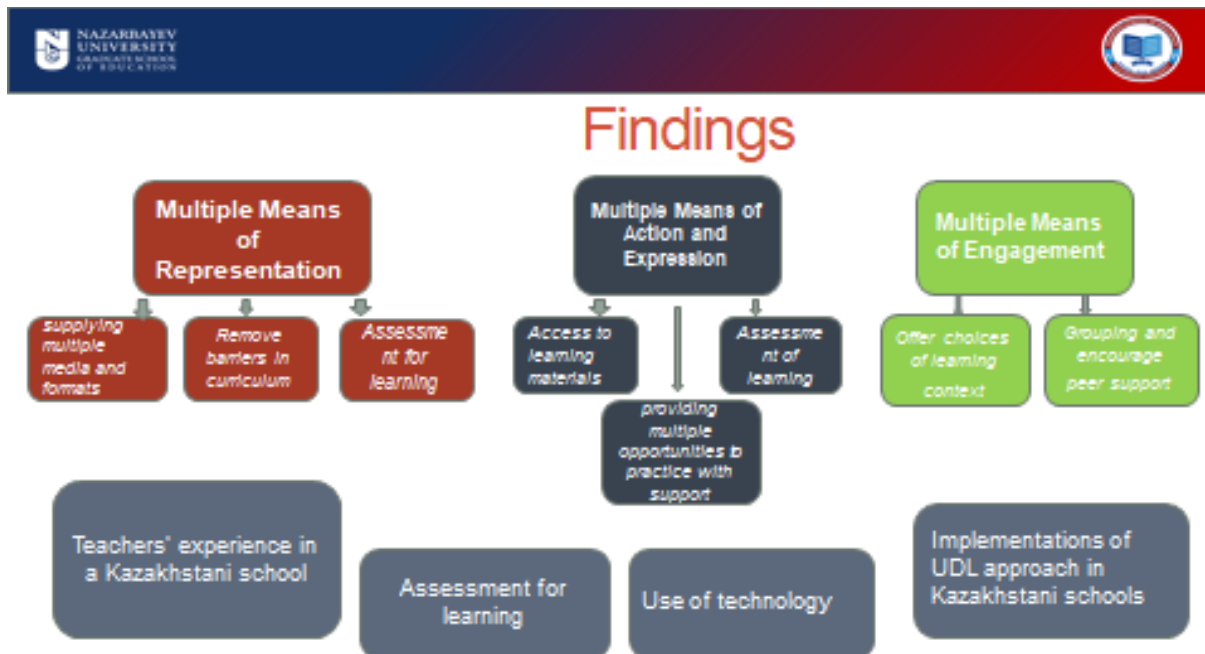


Figure 1. Main findings

4.3. Themes emerging from data

4.3.1. Teachers' experience in Kazakhstan school

These will address the general experiences of teachers in using the UDL. In this theme the following sub-themes emerged as important:

4.3.1.1. Types of students for UDL approach

The teachers thought that UDL is appropriate for particular students, i.e. When I asked do they have students with learning needs, they stated that they have students with a diagnosis of dyslexia, attention deficit hyperactivity disorder (ADHD), autistic spectrum disorder (ASD), diverse students, whose English is the second language. One of them stated:

“Yes, obviously yes. I have two children who find really difficult to remember all the sounds, put the words together, or use the numbers. That’s why I refer them to learning support.”
(Participant 3)

Another teacher, when I asked the same question, revealed:

“..we do, in math, it is a different subject because we do have different ability students. So rather have students with learning difficulties than special needs. We do have to work with them using different strategies.” (Participant 5)

Interestingly, when I communicated with Learning Support Specialist, she noted me that all primary teachers have students with learning needs, however, when I interviewed those teachers they answered more concisely, they explained what kind of difficulties those students faced, not just naming the diagnosis, but rather named the specific need in learning.

4.3.1.2. Teachers' knowledge about UDL

The study has shown that teachers knew very little about what UDL was. When I asked more about UDL approach, for example, what they know about UDL and if UDL familiar to them,

some responses were similar and they did not know the term. However, after my explanation and a short description of the UDL approach, they noted:

“Yes, sure I do use it, but do not know the term.” (Participant 5)

The responses demonstrated that the teachers use the strategies that align with UDL principles, however, they did not hear the term of UDL. The following interview question and responses will show the evidence.

4.3.1.3. Challenges of the UDL approach

The question that related to the challenges that the teachers faced in their experience, most of them mentioned:

a) Language problem

The teachers thought that the use of UDL was influenced negatively by the language deficit of students, for example when I asked

“...the language obviously is the barrier sometimes, especially here, where all of the children in my class are the children with English as a second language.” (Participant 2)

Another participant had a similar view:

“I think challenges in the classroom is getting the language to a certain level, bringing phonics to a certain level, the vocabulary, words.” (Participant 3)

b) Concentration and motivation

Another challenge the teachers faced in their teaching was the focus and the short attention span.

The teacher that had children with more serious and difficult learning needs expressed her opinion to the same question as:

“Sometimes children with specific needs may have the short attention span, they may find hard to be concentrated and be engaged with the task.” (Participant 4)

Another similar view:

“...some of the pupils that have lower language skills and lower ability children at this age, they engaged, motivated to do because they know there will be rewarded. But subconsciously they do not realize that their working is improving.”

c) Timing of support to students

Some teachers are very positive about the inclusion, they say that a child needs help and support but at the end of the year, unconsciously they achieving academic and social goals.

Teachers have shown the work of some students and claim that they have progress. It is proved because the student started to learn how to write at the beginning of the year.

Here is how they claimed:

“I mean it is wonderful because I been so pleased, just some writing of my children have produced, compared it to the first piece and you think OMG, they made so much progress, it is quite rewarding.” (Participant 1)

However, one of the participants was not so positive about the inclusive classroom in Kazakhstan school. And he shared his assumption in this way:

“Realistically, you can’t do that for every child every lesson every day, especially in the KZ context 30 children per class.” (Participant 4)

The school that was selected for the interview has the system of Teaching Assistants. According to the interviewers’ responses, TAs play a crucial role in supporting students with needs as well as a teacher during the teaching the class.

4.3.2. Assessment for learning

The study has shown that assessment was important for the use of UDL by teachers. A very important finding was that the teachers start to plan the lesson after the observation and assessment of the learners at the beginning of the year. Before planning the lesson they wish to know the children, their abilities, the level, interests, who might need additional support. They work closely with other teachers for cooperation and co-teaching. The following quotes from teachers demonstrate the importance of assessment to the UDL approach:

“The first thing you need to be aware of the current attainment. When first you see the class that you rely on the previous teacher’s what children’s level is, you very quickly make a note of what the teacher said, but really you make an assessment all the time and that guides then what you need to prepare for children in terms of a range of needs.” (Participant 4)

Other teacher revealed a similar respond:

“...just to make sure that whenever you plan the work, first you need to decide the children’s story, and what child can do at the beginning. You know the expectations at what line child can be, and the more you work with the children the more you can get used to knowing how much they can do. So then you know how much children need more help or support and in what way.”

It shows the teachers’ attitude to learning, how they are preparing for their lesson, how they meet the developmental needs of the learners, they understand the weaknesses and strengths of learners, as well as what adjustments need to improve in the environment for better and effective learning.

4.3.3. Pedagogical Use of UDL Approach

This section will address how teachers experienced the use of UDL. Here the principles of UDL be used as a framework to analyze how teachers did this. These principles are multiple

means of representation, multiple means of action and expression, and multiple means of engagement.

4.3.3.1. UDL Principle 1: Multiple Means of Representation

This principle focuses on the presentation of the educational materials using several instructional strategies.

i. Use of sensory and tactile materials

The study has demonstrated that the use of sensory and tactile materials for phonics and reading was one of the strategies that two of the participants mentioned they used to support their students during writing instruction. In addition to this, they provided a very interesting response that all students are having needs, as:

“all students I see in the class are having needs, everyone in the class has a different learning style, they come from different social background, the cultural background might be different, and it has an impact on teaching and learning.” (Participant 1)

Another interesting point:

“I vary the way we deliver, as they are visual learners, are they an auditory learner, or the kinesthetic learner. And that’s how I would approach it.” (Participant 6)

ii. Use of visual resources

The study seems to suggest that most of the teachers prefer to use visual materials during presenting new information for students.

Most went on to state that they focus on visual resources for learners during introducing the instruction. Two of the participants noted that they used video that helped them to support students’ development of background knowledge.

“I try to introduce it in different ways, for example, I use technologies, videos, actions. I also make sure that everybody can have access to what we are learning about.” (Participant 2)

iii. Use of non-verbal communication

The study shows that another strategy that was employed was the use of non-verbal communication they are very active with gestures and body movement. They mentioned the Makaton sign they use that helps to develop students’ language and literacy skills.

Participants know their students, and understand that their students are from the different cultural background and most of them have challenges with language. Consequently, teachers make effort to introduce new topics more visually, they use different strategies to support not only learners with needs, but rather everyone as well learners with a language barrier, so everyone can benefit from it.

4.3.3.2. UDL Principle 2: Multiple Means of Action and Expression

This principle focuses on how a student can be developed in planning, executing, and self-monitoring skills and actions.

i. Access to the learning material

The study reveals that one of the strategies many teachers mentioned about was access to what they are learning. The young students are given the choice to different activities. The learners can do writing on a smartboard or using pen and whiteboard, or they can use blocks with letters on them. The reduction of writing was another strategy. The teachers stated that they were not expecting all students to write the same amount. They have expectations that students need to achieve, some of the students cannot do that, but they get extra support to achieve the goal in writing.

“...sometimes children are given choices, so they might go and do something they are comfortable with.” (Participant 1)

ii. Methods of assessment to demonstrate learning

The study shows that the teachers use rubrics for learners to make the objective clear and students can get stickers or rainbow dots to earn the certificate at the end. Two of the interviewees stated that they use the formative assessment of learning. They could ask questions to know how student gained knowledge. Students could create the projects as an exit point of the unit. Projects could be completed with different tools and materials. The use of technologies was mentioned that helped students to demonstrate their learning, such as presentation, flip cameras.

The most valuable information was the use of rubrics for young learners. Teachers set clear goals and objectives for students that make teaching straightforward. The learners know what they are expected to do, and they know the criteria of getting the stickers. This strategy brings progress when the learners need to complete their independent work.

“If we are doing the ‘the rainbow write’, we have got a clear target, so if you look there I have it on the wall, so each child, when they have done their writing they will get a little dot for each piece of writing, so this is the criteria.” (Participant 1)

Another view:

“...obviously, not every child will achieve the criteria, it is difficult for them too, but that is what we try to do.” (Participant 2)

4.3.3.3. UDL Principle 3: Multiple Means of Engagement

The third UDL principle addresses the motivation for learning. It determines how students stay motivated, their engagement during the activities and how the learners are challenged and supported (Rose, 2002).

The principle entails the following:

i. The environment and classroom setting

The study reveals the importance of the environment for learners to get engaged. Three participants noted how the environment was important for students. They mentioned the regular changes in seating arrangements (carpet, quiet zone), several tables and comfortable chairs that allowing students to move around the room.

Respondents mentioned that they created the classroom environment according to the interests of the students where it was applicable and related to the learning curriculum. For example, different development corners as book area, creative area, blocks and cars, all these mentioned areas allow students to stay engaged.

ii. Using games to catch attention

This study demonstrates that games play an important role to attract students' attention during the learning process. Some teachers mentioned about short attention span among the learners and that games are a helpful strategy.

“...changing routine is the best approach among young learners, so if you work 25 minutes, stop it and play quick games, children refreshed, it takes two minutes to get up and move. Just make things short and concentrated.” (Participant 7)

Additional supportive opinion:

“The main thing is to keep task into smaller chokes, we use different tasks and games, keeping them switch on, focused.”

iii. Dividing students to groups

The study shows that most of the teachers split the students by groups for the accommodation of the activities to finish the task.

One of the teachers shared his opinion about this question:

“I divide the tables according to the abilities of children, so high, middle, and lower ability children. They can do tasks in their own pace, higher ability children can work independently, whereas lower ability children need support, so usually TA (teaching Assistant) supports them.”

(Participant 8).

Participants use different strategies to support children’s engagement during the lesson, however, most of them are similar like using the games to stimulate children’s concentration. In addition, breaking up the children in a group seems very helpful teaching strategy. However, the most crucial finding was the use of a peer-support program that aligns with UDL strategy, as well as with Vygotsky theory of Zone of Proximal Development. When they mixed different abilities students to make them interact with each other and work with new information by explaining to peers.

“I think breaking them in groups, giving them a partner work is also useful that makes them responsible and more engaged within the activity.”

4.3.4. Interviewee implementation of technology

This section addresses the usage of technology in the learning process. The study shows that teachers use technology to support learners in the classroom.

All three of the interviewees mentioned how technology was important to support students in the classroom. Items such as Smart Boards, online programs, online book club, Ipads, and Flip cameras were mentioned as being used by the students. However, teachers used Smart Boards most of the time, to present information, to show videos. In addition to this, three interviewees mentioned using software to support literacy and math:

“...the school has invested in Mangahigh, it is the interactive math games, so I engaged them with the competition, and two of my pupils have won a gold medal.” (Participant 1)

Another teacher’s view of the use of technology in math lesson:

“We can access iPads, and for example, if children finished their math lesson earlier, you know there are some high achievers, so they have another choice of activity” (Participant 7)

The teacher’s point to technologies as a game:

“at the break of the lesson, the smart board is good for games, so many children involved in quizzes, at asking the questions. But still, you can see when they are playing how are they doing.” (Participant 3)

4.4 Conclusion

This chapter provides the result of data analysis. It discussed the findings emerged from the interviews to answer the research questions. The results of each question were addressed separately and the analysis was organized based on following themes as teachers’ experience in a Kazakhstani school, assessment for learning, use of UDL strategies, and the implementation of technology. All mentioned themes were contained of the interviewees’ quotes. In addition to that, the chapter described the data analysis process, how the data were coded and how the themes emerged.

General teachers reported having different challenges in teaching in Kazakhstani context, most significant of them was the language barrier. However, they are provided with the important support of the school as having Teacher Assistants in the classroom, as well as good resources.

Teachers shared their experiences in teaching children with needs and what are the most helpful and meaningful strategies they use. The teaching strategies they use that align with UDL principles, however, they are not familiar with this term.

Chapter 5: Discussion

5.1 Introduction

The previous chapter analyzed the results that emerged from data of the study. It analyzed the coded data that constructed the main themes. This chapter will restate the research aim and objectives, provide the summary of the study then discuss findings in light of prior research in order to make conclusions.

5.2 Re-stating the aim and objectives of the study

This study had three purposes. The first purpose was to determine what experience teachers have in using Universal design for Learning (UDL) as a learning support strategy and how primary teachers design and implement Universal Design for Learning (UDL) lessons. The second purpose was to examine the familiarity of UDL among the primary teachers what teaching strategies teachers use that align with UDL principles. The third purpose was to determine how UDL can be integrated into teaching in the Kazakhstani context. Results for each research question are addressed separately in this chapter. The study was aimed at answering the following research questions:

What are the teachers experiences in using UDL as a learner support strategy?

To answer this question the following sub-questions were asked:

To be answered through literature review:

- What do we know about UDL framework?
- In what ways has UDL been used to support student learning in inclusive classrooms?

To be answered through an empirical study

- How can UDL be integrated into teaching of inclusive learners in a Kazakhstani classroom context?

5.3 Summary of the study

Chapter 1 Introductory orientation: The introduction of the paper provided general information about educational policy of Kazakhstan. That part presented the purpose of the study, research question, statement of the problem and it provided information about the significance of the study.

Chapter 2 Literature Review: The literature review part provided information of the theoretical framework of Vygotsky. First it gave us definition of the UDL theory, its background, and explanation its connection with sociocultural theory.

Chapter 3 Research Methodology: This part of the study provided a description of the methodology in accordance with which the whole study was conducted. To achieve the goal of the study, a specific strategy was defined: research design, sampling process, data collection tools. The research was conducted in the school in Nur-Sultan City.

Chapter 4 Analysis and Results: It provided the reports on data analysis and also presented interpretations of the interviews. The data emerged from the interviews was divided into four themes. The themes are justified by the excerpts from interviews and further they demonstrated the interconnection between different source of data.

Chapter 5 Discussion of findings: This chapter started by restating the research aims, research questions and the objectives of the study. Furthermore the findings are discussed in relation to the literature that presented in chapter 2 in order to indicate whether the study has found new knowledge.

Chapter 6 Conclusions and Recommendation: This chapter provided the conclusion based on discussions, and recommendation for different stakeholders. The limitations and the areas for further research were discussed and the chapter concluded the study.

5.4. Discussion of Findings

This section does two things, firstly, it will link the findings of the study with the theoretical framework of Vygotsky principles of sociocultural theory and UDL principles as discussed in chapter 2. A visual presentation of connections between theory and the findings is presented in form of a diagram after which it is explained.

Secondly, for a more in-depth discussion of the result of the study, the themes are discussed in relation to research questions. The first section will address the research question 1 and examine the experience of using the UDL strategies among the interviewed respondents.

5.4.1 Discussion of findings in relation to literature

a) Teachers' experience in Kazakhstan school

Research Questions 1: What experience do teachers have in using UDL as a learning support strategy?

These will address the general experiences of teachers in using the UDL. Under this theme the following sub-themes will be discussed: types of students for UDL approach, and challenges the teachers faced in the teaching and learning process with diverse students.

One of the new aspects revealed as a result of the analysis in this research is the attitude of teachers towards students. My goal was to find out what kind of learning difficulties and needs students have, but beyond that I gained new perspective about teachers' attitude.

Therefore, the teachers practice UDL strategies with students who have diagnosis of a dyslexia,

attention deficit hyperactivity disorder (ADHD), autistic spectrum disorder (ASD), diverse students, whose English is the second language.

Interestingly, when I communicated with the Learning Support Specialist in the school at which I interviewed, the specialist noted for me that all primary teachers had students with learning needs, however, when I interviewed the teachers they provided me with more concise answers. They stated what kind of difficulties those students faced, not just naming the diagnosis, but rather explaining the specific need in learning.

The study shows that the teachers have positive attitudes towards students with learning needs; they treat all students equally regardless of their abilities and diagnosis. A previous study shows that a positive attitude towards students with learning needs plays a key role in teaching and learning. Moreover, this is an important aspect of classroom interaction, i.e. how a teacher understands and reacts to learning behavior of their students.

Another research paper notes that using UDL benefits not only the teaching of students, but it is also beneficial for teachers in some way, because they are exempted from the creation of special adaptations, thus generating additional time to meaningful interaction with all of their students (Meier, 2013).

b) Pedagogical Use of UDL Approach

This section will address the second research question about the familiarity of UDL among the teachers and what strategies they used that aligns with UDL principles. The pedagogical approach includes three principles: multiple means of representation, multiple means of action and expression, and multiple means of engagement.

I. UDL Principle 1: Multiple Means of Representation

The first principle of UDL, the ‘multiple means of representation’, takes into account the belief that students learn through their ability of recognizing and understanding patterns, information and concepts (Meyer & Rose, 2000). An example of this can be when a student learns how to read. In order to achieve the goal, the component of UDL principle was used, that is *supplying multiple media and formats*. This component of the multiple means of representation principle is based on the concept that all learners should be provided with various media and formats (Rose, 2000). Thus, this diversity offers how each learner converts new information. To achieve this goal to reach diverse students, teachers should scaffold student learning through the use of multiple media and formats (Gersten & Clarke, 2007; Okolo, 2006). The study has demonstrated that the use of sensory and tactile materials for phonics and reading were one of the strategies that two of the interviewees noted they used to support their students during writing instruction. Another strategy that the interviewees mentioned was which important in teaching diverse learners was the use of visual materials.

The study seems to suggest that most of the teachers prefer to use visual materials during the presenting of new information to students as well as to support student development of background knowledge.

Interviewers state that they take into consideration the learning needs, interests, abilities, while creating a lesson plan. Before designing the lesson plan they observe and assess students closely and attentively in respect to the amount of support needed by learners as well as define the level of learners.

The study has shown that assessment was important to the use of UDL by teachers which can be applied to principle 1 of the UDL approach. A very important finding was that the teachers start to plan the lesson after the observation and assessment of the learners at the beginning of the year. Before planning the lesson they wish to know the children, their abilities,

the level, interests, who might need additional support. They work closely with other teachers for cooperation and co-teaching.

II. UDL Principle 2: Multiple Means of Action and Expression

This principle focuses on the student's ability to plan, implement and self-monitor skills. The study revealed two important sub-topics: access to learning material for students allowing them to learn how to be independent and responsible by choosing the activity and completing it, and the second sub-topic is method of assessment to demonstrate learning. The latter suggests multiple ways of showing the skills the students learned.

Access to learning material

The study found that participants provide access to learning environment for all students. The young students are given the choice of different activities, for example the teacher mentioned that for writing the learners could do writing on the smart board, or use a pen and white board, or they could use blocks with letters on them. The reduction of writing was another strategy. The teachers mentioned that they did not expect all students complete the same amount of activities. They have expectations that students need to achieve, some of the students cannot do that, but they get extra support to achieve the goal in writing. These results are backed up by the component of UDL principle suggested by Rose (2002), *providing multiple opportunities to practice with support*. Students can work in isolation with the support of the Teacher Assistant, however, but also there is an opportunity to use scaffolding when the learner practice during the a complex process (D. H. Rose et al., 2002).

One more crucial finding was about active independent learning that sociocultural theory contains in itself. It states that "the adult shifts increasing responsibilities for the talk and cognitive activity to the students while the adult remains ready to support students' performance

when they struggle” (Palinscar & Brown, 1984, p.120). This view focuses both on the social and situated nature of knowledge development. According to the emerged data, the interviewed teachers use strategies that are equal to UDL principles. The interview participants provide students with responsibilities to learn independently and letting them learn as much as possible. One more option of independent learning is providing the students with choices. The students can choose the activity they are comfortable with that would be related to learning topic.

Methods of assessment to demonstrate the learning

One of the components of this principle according to Rose (2002) is offering flexible opportunities to demonstrate skills. It is important to provide students with convenient and flexible opportunities that will allow them to show the skills they have learned and invite them to use all the steps and parts of the process during the demonstration and implementation of skills.

The study shows that the participants applied this component in teaching, for example the use of rubrics for learners to make the objective clear and students could get stickers or rainbow dots to earn a certificate at the end.

The most valuable finding was the use of rubrics for young learners. Teachers set clear goals and objectives for students that made teaching straightforward. The learners knew what they were expected to do, and they knew the criteria for getting stickers. This strategy enhanced progress when the learners needed to complete their independent work.

III. UDL Principle 3: Multiple Means of Engagement

The third principle of UDL focuses on multiple means of interaction that supports a variety of effective learning areas. In this area, it is emphasized that the level of attention that students pay to a learning task or task depends on students’ motivation and interests (Meece, 2003; D. H. Rose et al., 2002).

The following components help support the third UDL principle, multiple means of engagement.

Offer choices of learning context (Clarke & DiMartino, 2004; D. H. Rose et al., 2002; Wright, 2006). The study revealed that the environment and classroom setting play an important role in offering a choice of learning context, therefore the students could easily move and access the learning material and become engaged. Two of the three interviewees stressed how seating arrangements was important to support students' engagement. Since it was primary learners, and their attention span was short, teachers placed them on the carpet on the floor, so they could easily access to the learning as well did physical activities if they felt they were tired. Teachers tried to manage the environment to support learners in their classrooms, creating different developmental areas and placing the furniture to make sure that students can easily move around the classroom.

According to the components of UDL principles teachers *provide adjustable levels of challenge* (D. H. Rose et al., 2002). Previous studies show that teachers achieve two goals by adjusting the level of tasks in their learning tasks. First, by changing the level of difficulty, teachers allow students to work in the zone of proximal development (ZPD), where learning is beyond their current capabilities, but not beyond reach.

The study uncovered that in addition to adjusting the challenges of the activities participants also actively used games to catch attention. Games play an important role in attracting students' attention during the learning process. Some teachers mentioned the short attention span among the learners and that games are a helpful strategy.

Vygotsky realized that at any given time, some tasks only slightly exceeded the capabilities of the child. The child could be close to mastering the intellectual skills necessary to

complete the task, but it was a bit complicated to cope with it alone. However, children working in this area can progress rapidly if they act under the strict guidance of a more experienced partner. The study demonstrated that the participants practiced group work when they placed students with different abilities to interact and complete the task. Another option of their practice was breaking the class into three groups according to their abilities, therefore the high ability students worked independently, while lower ability students were offered the support of the teacher or teacher assistant to complete the focus activity.

In addition to this, the sociocultural theory suggests that the sociocultural “teacher interacts at a meta-cognitive level where the dialogue encourages the learner to think through a problem rather than positioning the learner to receive the teacher’s answer” (Grabinger, Aplin, & Ponnappa-Brenner, 2007, p.22). The interviewer’s response shows evidence of using UDL elements in his teaching.

c) Implementation of technology

These studies show that teachers use technology in teaching, which coincides with the principles of UDL. The study shows that in terms of engagement, the technology is a very useful method in teaching, especially for engaging students. For example, if some students completed a task sooner than others, they may have access to iPads, an interactive whiteboard, and other online applications. In addition to this, to present the lesson, the teacher finds the technology a necessary tool for providing new educational material. Technologies are always more interesting, more interactive, teachers can show different educational videos. But some have found technology not to be a reliable tool and for the most part, rely on themselves.

The interesting point of this study is that teachers noted that technology as support and help for children's needs is not very effective due to the age of students. As students are of the

primary setting, some of them only start to learn how to read and write, and obtain basic knowledge, teachers believe that the role of technologies are not applicable.

d) Implementations of UDL approach in Kazakhstani schools

This section will address the third research question to determine how UDL can be integrated into teaching in the Kazakhstani context. The study revealed the following challenges the teachers faced in their teaching experience.

Teachers met the challenge of the language barrier among learners. The school focuses on English as the main instructional language to educate the students. That leads to poor interaction between the students which make it difficult to fully use UDL strategies. Another problem uncovered was timing of support to students. Some teachers were very positive about inclusion, and were ready to help and support the students who needed help however, the school that was selected for the interview had a system of Teaching Assistants (TA). According to the interviewees responses, TAs play a crucial role in supporting students with needs along with the teacher during the teaching of the class. Taking into consideration the mentioned challenges the UDL can be integrated in Kazakhstani educational context of primary classes only if the schools have additional support for teachers.

5.5 Conclusion

This chapter discussed the most important findings of the study of UDL in a Kazakhstani school. Along with this, the major research questions were addressed, concerning teacher's experience of using UDL as a learner support strategy, the familiarity of UDL approach as well as the implementation of this approach in Kazakhstani context.

The very interesting and new finding was that all the principles of UDL are used by teachers in the school, but the teachers were not aware of the concept and name of this approach.

It turns out that teachers use it on the basis of their experience and assessment of students at the beginning of the year. UDL helps students to achieve educational goals and make academic progress, with the help of a variety of educational materials, and different types of instructions that allow students to get information, work with it and be able to show what the student has learned.

The research findings of this study revealed that the teachers use instructional strategies that associate with UDL principles that were based on the sociocultural theory of Vygotsky. Teachers have positive attitudes to diverse students who need additional support in learning. They organize planning after they observe and assess the learners to take into consideration the range of students, their strengths and determine where support is needed for support for more efficient learning. The assessment shows that some students can be kinesthetic, audial or visionary. To meet the needs of learners the teachers use various materials with multiple ways of presentation, engagement and expression. One of the key strategies that were revealed in the result of the discussion was using a peer-support program in which the teachers provide students with the opportunity to learn independently, choose the activity they want, the materials they find helpful, and ask others to help. Another key element of this chapter was the part about technology that plays an important role in presenting the information and during the engagement process, to make learners be more concentrated, also it offers opportunity to use learners' time with efficacy. Another insightful finding was the use of rubrics for young learners to enhance their understanding of the aim of the task. The teachers claimed that clear criteria and goals help students to be more successful with completing the task.

Chapter 6: Conclusion and Recommendations

6.1 Introduction

In the previous chapter, I presented the discussions based on the results of the analyzed data. This chapter summarizes the research findings, the implication of these findings, and makes recommendations for policy and practice.

6.2 Summary of Findings

According to the study's findings, most of the teachers who participated in the interview had very little knowledge about Universal Design for Learning. It is an important piece of the study to note that UDL framework has existed since 1995, although it is not a well-known theory to teachers. A possible reason for this result is that UDL theory comes from the field of special education. Another reason for participants lack of knowledge of UDL theory is that only two out of eight teachers were special education teachers. However, the findings demonstrated that even though teachers had a lack of awareness of UDL they still used the teaching strategies that align with UDL principles. It can be explained by the teachers' attitudes towards students with learning needs, and also precise observation and proper assessment of the learners at the beginning of the learning journey. These strategies helped them to know the students' stories, their strengths in learning and needs that could be addressed. In addition to this, teachers took into consideration that most of the students had English as a second language which could be a reason for the students' needs. Therefore, knowing the students' stories allowed the teachers to see the whole picture and support the learners providing them with multiple ways of presentation, engagement, and expression.

However, both awareness and implementation of this theory among general education teachers could be increased by providing professional training for them. Providing the training for teachers on UDL would not only support general education teachers addressing the needs of children with disabilities but would also help them to support the learning needs of all learners in the classroom.

The teachers who participated in this study implemented instructional strategies that align with multiple ways of representation (UDL principle 1). It shows that the teachers used various ways to present instructions to their students. However, when examining what types of strategies were implemented most often for UDL Principle 1, it appeared that teachers were helping students by presenting materials using variety of media. For example, the study demonstrated that the use of sensory and tactile materials for phonics and reading was one of the strategies that was used more often to support students during writing instruction. Another strategy that the interviewees mentioned as important in teaching the diverse learners was the use of visual materials.

The study suggests that most of the teachers preferred to use the visual materials during presenting new information to students as well as to support student development of background knowledge. All these strategies used come from assessment and observation of the learners at the beginning of the year to know the students' abilities, interests, strengths, and needs.

Likewise, the instructional strategies that teachers implemented to support multiple means of action and expression (UDL Principle 2) focuses on students' ability to plan, implement and self-monitor skills. The main strategies that the teachers used in the school were the setting of clear objectives and providing access to learning materials. Access to the materials allow the students to develop an ability to plan, be more independent, and the teachers can

benefit from it by having some free time to observe the learners or provide the support to those who need it. The second strategy provides rubrics to learners to monitor learning. The clear objectives allow them to see what to work on, and what needs to be improved.

The teachers in this study implemented the strategies for multiple means of engagement (UDL Principle 3) by focusing on their instructional tasks, providing students with options, and adjusting the level of challenge. This indicates that learning was student-centered. Another strategy that was beneficial for students with needs as well as for students with learning needs was a peer-support program that allows different ability students to work together.

Teachers in this study used technologies very often to support the instructions and information they presented (video, presentation, smart boards,) rather than providing students with access to the curriculum or demonstrate the learning. It was also used to support the students' engagement during the class, the high ability students could work with technologies to complete the task, to work independently, while a teacher could provide a low ability student with support.

In terms of implementation, the UDL framework could be introduced into Kazakhstan schools, if the provision of material and resources were to be taken into account. That would allow primary teachers to provide children with free access to materials for independent learning. Also, teachers should conduct monitoring and testing of children in order to learn their abilities, and what strategies to implement in order for all to benefit. This study mentioned the role of language as a barrier to interaction between the teacher and students since the medium of instruction at the school was English, and for some students, English was the second language. However, if we take into account the Kazakhstani schools with one language of instruction, either Kazakh or Russian, then this barrier as a challenge disappears. An important mention was

the role of teaching assistants. They provided tremendous assistance in organizing the classroom and working with children who needed help.

Universal Design for Learning is an instructional framework that is not well known in Kazakhstani schools. However, despite the fact that it is not familiar, the results of the study show that the strategies used by teachers in the school were similar to the principles of UDL. This is an indicator that teachers did not intentionally introduce UDL, but used strategies that would support students' understanding of the material and the possibility of working with it.

The little awareness of UDL indicates the need to provide continuing professional development opportunities for teachers to learn about, practice and reflect on it. It is very important for general education teachers to have this training because they are at a disadvantage in terms of addressing students with learning needs. In addition to this, teachers could support the learning process of students as well as allowing for students with learning needs to study equally.

6.3 Recommendations

Several key recommendations for relevant representatives would be helpful in addressing the issues discussed in the study:

To the policy makers: support teachers by providing them with effective and useful professional trainings in educating students with learning needs;

To the school leadership: advocate the principles of Universal Design for Learning and support teachers in their teaching process of improving their class practices;

To the teachers: examine and explore new effective strategies in teaching students with learning needs that would be beneficial for everyone.

6.4 Limitations

This research study had two main factors that were limited. The first was lack of observation methods to see the clear picture of addressing the UDL implementation. Since the school addresses the diverse needs of students, the participants could not respond to the questions fully, as the use strategies were the norm for them. However, using the observation methods along with the interview could have given more information and disclosed this question further.

The second limiting factor of the study involved the time constraints, that limited me to ask more questions about the role of resources and its availability, also about teacher time for implementing UDL strategies.

6.5 Areas for further research

Despite the fact that teachers used some teaching strategies that include UDL principles, it leads to the future study of UDL as a whole framework. Knowing that the teachers implemented the UDL strategies that can increase their confidence in teaching and it is possible that the system can be fully implemented.

Also, the effectiveness of using UDL in teaching might be researched in the future, in order to further implement this theory in other schools.

6.6 Conclusion of the Study

Today teachers have the diverse needs of all students in their classroom that they need to accommodate them (Meier, 2013). This diversity occurs in terms of varying levels of abilities as

well as cultural differences. Teachers need to understand all aspects of diversity in their students in order to address their needs and support their learning. Universal Design for Learning is reviewed as an effective tool to assist teachers with addressing the varying needs of the learners in their classrooms.

This study started as an inquiry to examine how teachers instruct using strategies and technology in their daily teaching practice that includes Universal Design for Learning framework. However, the emerged results offer more information than just examining UDL. They provided information on what currently, teachers are implementing in classrooms to support the students with diverse needs and help them to access the general education curriculum.

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Appendices

Appendix A

INFORMED CONSENT FORM

The use of Universal design for learning to meet the needs of diverse students

DESCRIPTION: You are invited to participate in a research study on the investigating the teachers' familiarity of UDL (Universal Design for Learning) concept and what techniques teachers use that align with the concept of UDL. As a part of the study, you will be asked to participate in the interview. Your participation in this research study is voluntary. Your responses will be recorded, but will be kept confidential. After analysing the given responses, the tape will be deleted. The results of the study will be used for scholarly purposes only.

TIME INVOLVEMENT: Your participation will take approximately 30 minutes.

RISKS AND BENEFITS: There are minimal risks to participants associated with this study.

PARTICIPANT'S RIGHTS: If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate. You have the right to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

CONTACT INFORMATION:

Questions: If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work, Tsediso Michael Makoelle, tsediso.makoelle@nu.edu.kz, +7 (7172) 70 9368.

Independent Contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the NUGSE Research Committee to speak to someone independent of the research team. You can also write an email to the NUGSE Research Committee at gse_researchcommittee@nu.edu.kz

Please sign this consent form if you agree to participate in this study.

- I have carefully read the information provided;
- I have been given full information regarding the purpose and procedures of the study;
- I understand how the data collected will be used, and that any confidential information will be seen only by the researchers and will not be revealed to anyone else;
- I understand that I am free to withdraw from the study at any time without giving a reason;

- With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Signature: _____

Date:

The extra copy of this signed and dated consent form is for you to keep.

According to the law of the Republic of Kazakhstan an individual under the age of 18 is considered a child. Any participant falling into that category should be given the Parental Consent Form and have it signed by at least one of his/her parent(s) or guardian(s).

Appendix B

Interview Protocol

Theme: The use of Universal Design for Learning to meet the needs of diverse students.

This research is about UDL (Universal Design for Learning) concept and it aims to explore how teachers are familiar with this pedagogical strategy and how they use it during their classrooms.

As part of the study, you have been invited to participate in an interview. I will ask you some open-ended questions about your experience of using UDL strategies or maybe using other strategies that similar to UDL idea that support learners' needs. If it is possible the interviews will be audio recorded with your permission. The tapes will be used only for data analysis purposes. No one will use your name in reports, so your privacy will be protected. The results of the study will be used for scholarly purposes only. Interview will last approximately 30 minutes.

Interview Questions Demographic:

1. Can you tell me about yourself?

What school level do you teach?

How many years have you taught?

Lesson Planning/Accommodations and Modifications:

2. How do you plan for the diversity of students in your classroom? (e.g., What do you think about? The range of students in your classroom; Student needs; Student strengths and weaknesses; Student engagement)

Assessment of Familiarity of Universal Design for Learning (UDL):

3. How do you understand universal design for learning? UDL Implementation:
4. What strategies have you found helpful in your instructional practices?
5. What are the challenges of teaching in diverse environment?
6. What are the most common ways that you have implemented useful methods in your instruction?
7. What differences have you noticed in the classroom that you would say are a result of implementing instructional strategies?
 - a. Instructional?
 - b. Behavioral?

Three UDL Principles and Technology:

8. What strategies do you use to present your lesson to address the diverse learners?
9. What strategies do you use to support the diverse learning needs of the students in your classroom? (e.g., exemplars of student work; rubrics for guidelines; varied assessments to demonstrate learning).
10. How do you support students' engagement during the lesson? (choice content, access to materials).
11. Do you find technology helpful and practical as a tool to provide students access to learning? What kind of technology do you use most of the time?

Thank you for cooperation and participation in this interview!