

Faculty Collaboration to Support Implementation of  
Universal Design for Learning (UDL)

by

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## ABSTRACT

Given the increasing number of students with dis/abilities<sup>1</sup> entering higher education institutions (HEI), it is imperative higher education faculty have the knowledge, skills, and disposition to effectively support students with dis/abilities. Therefore, this study engaged higher education faculty at Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU). ASU is an institution that prides itself on being inclusive. Accordingly, MLFTC enrolls many students with a dis/ability. In spring of 2022, more than 350 MLFTC students had disclosed their dis/ability and registered for accommodations. However, there were likely many more students attending MLFTC who had chosen not to disclose their dis/ability status. Consequently, faculty members need a proactive approach to meeting the needs of students with a wide range of knowledge, skills, and experiences including students with dis/abilities.

Universal Design for Learning (UDL) offers an effective framework to proactively support students with dis/abilities, even if they choose not to disclose their dis/ability status. Faculty need professional development and collaboration opportunities to develop to integrate inclusive instructional strategies aligned to UDL. This study was designed to provide higher education faculty members opportunities to develop their skills to integrate UDL in their classrooms. The participants completed three asynchronous online modules about the principles of UDL and three Innovation Configuration (IC) map design sessions. During the IC map design sessions, they co-developed an IC map articulating

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<sup>1</sup> Throughout this paper a slash will be used within the term dis/ability. I have made this choice to reflect the complex nature of societal expectation of ability, as well as historical preference for what has been seen as typical. Goodley (2017) explained “the slashed and split term denotes the complex ways in which opposites bleed into one another” (p. 198).

how they would like to see UDL operationalized in their courses. Data was collected throughout the project through a pre/post inventory, transcripts of the IC map design sessions, interviews, a classroom observation, and the co-developed IC map. The results show that faculty collaboration likely has a positive impact on faculty integrating instructional strategies aligned to UDL. However, collaboration may have a limited impact on the underlying belief system faculty have about the use of inclusive practices, especially for students who do not have a dis/ability or have chosen not to disclose their dis/ability through official university channels.

## DEDICATION

I dedicate this dissertation to my family for your unwavering support. To my husband for being a cheerleader every step of the way. To my children for inspiring me through their persistence and curiosity as learners.

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## CHAPTER 1

### INTRODUCTION

ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.  
(Arizona State University Charter, 2014)

#### **Context**

Arizona State University (ASU) is an institution that prides itself on its inclusive nature, as exemplified in its charter. This clear focus on not simply including people but in supporting them to succeed is vital in today's higher education landscape, where the student body is increasingly diverse nationally (Espinosa, L. et al., 2019; Hartsoe & Barclay, 2017) including at ASU. ASU's student body includes students from communities which had previously been underrepresented in higher education institutions (HEI). For example, ASU has taken action to admit and support first generation college students (Hinz, 2022a), had over 35,000 Pell grant recipients during the 2017-2018 academic year (United States Department of Education, n.d.), and was recently named a Hispanic serving institution (Hinz, 2022b). Additionally, HEIs have in recent years admitted an increasing number of students with dis/abilities (Fleming et al., 2017; Hartsoe & Barclay, 2017; Lombardi & Murray, 2011; Madaus et al., 2021).

The increased number of students admitted into HEIs with dis/abilities includes students with invisible disabilities (Kreider et al., 2015). Invisible dis/abilities, sometimes called hidden dis/abilities, include an array of dis/abilities such as learning disabilities, mental health disorders, and acquired brain injury (Mathews, 2009; Venville, et al., 2016). Invisible dis/abilities by their very nature are difficult for faculty to detect as they

are not immediately apparent. For example, a student with anxiety may employ coping mechanisms, such as self-medicating (Pascoe et al., 2020), which mask the impact of their anxiety. Therefore, it is vital that faculty in higher education integrate strategies that support a variety of learners, as they may not be aware of the challenges to success students are potentially facing.

My experiences as a Clinical Assistant Professor in the Mary Lou Fulton Teachers College (MLFTC) at ASU have led me to believe that a systematic approach to supporting all higher education students is imperative. Currently, a significant discrepancy exists in the way in which supports are provided for students, who have disclosed their dis/ability and students who have not disclosed their dis/ability or have an unidentified dis/ability. During my time teaching in higher education, I have worked with a number of students, who had formal accommodations due to their disclosure of their dis/ability status to ASU's Student Accessibility and Inclusive Learning Services (SAILS) department. Additionally, I have had students in class who needed accommodations to meaningfully engage with the course content which I suspect was due to an undisclosed or unknown dis/ability. Providing accommodations to students, who have not disclosed a dis/ability is not required; the requirement for universities to provide accommodations is part of the Americans with Disabilities Act (ADA) and only applies to students who have disclosed their dis/ability through official channels.

ADA uses the term reasonable accommodation, defined as the “acquisition or modification of equipment or devices, appropriate adjustment or modifications of examinations, training materials or policies, the provision of qualified readers or interpreters, and other similar accommodations for individuals with disabilities”

(Americans with Disabilities Act, 1990). In alignment with the concept of reasonable accommodations, many common accommodations for students with dis/abilities focus on access to instructional materials (e.g., enlarged print, alternative text, audiobooks). The focus of this action research (AR) project is on the integration of instructional strategies that move beyond access into meaningful engagement. For the purpose of this AR project, meaningful engagement is defined as students interacting with course materials and activities (e.g., readings, media, lectures, assignments, class discussion, office hours) in order to construct new understandings by incorporating course content into their existing knowledge and experiences.

I propose Universal Design for Learning (UDL) as the framework to guide a systematic approach to providing support to all students regardless of their dis/ability status. UDL focuses on proactively designing instruction that anticipates learner variation (Posey & Novak, 2020), which supports meaningful engagement in the course content for all learners (Rose et al., 2006). Further, I posit faculty collaboration is key to operationalizing instructional practices aligned to the UDL principles. Therefore, I seek to understand how faculty co-construct knowledge around operationalizing UDL in a higher education setting, how collaboration influences faculty disposition, and how collaboration may aid in operationalizing instructional practices aligned to the principles of UDL in a higher education classroom.

In this chapter, I describe the context for inclusion and education of students with dis/abilities at the international, national and local levels and define the recommendations and regulations influencing practices and procedures at each level. Additionally, I define my problem of practice, describe the proposed innovation for this AR project, and share my research questions.

### **International Context**

The influence of advocacy through mechanisms like the Salamanca Statement and the Incheon Declaration have contributed to an increase in students with dis/abilities entering higher education across the globe (Novak & Bracken, 2019). Therefore, a need for education systems to acknowledge and operationalize recommendations for inclusive education has developed.

Prominent international agencies, including the United Nations Educational, Scientific, and Cultural Organization (UNESCO) have called for sweeping change to the ways in which students with dis/abilities are included in educational settings and opportunities through policy development and implementation. In June 1994, representatives from 92 countries signed the Salamanca Statement (UNESCO, 1994), which provides a framework for meaningful inclusion for people with dis/abilities in education. The framework specifically calls for nations to adopt policies that support a “nationwide strategy aimed at achieving education for all” (UNESCO, 1994, p.17) and includes eleven policy recommendations with a strong theme of educating people with dis/abilities alongside their typically developing peers. In 2015, at UNESCO’s World Education Forum held in Incheon, Republic of Korea, the global commitment to inclusive education was reaffirmed (Novak & Bracken, 2019). At this time, sustainable

development goal (SDG) 4 was adopted. SDG 4 is to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations, 2018, p. 27). HEIs are embracing this mandate with higher application and acceptance rates for students with dis/abilities (Lightfoot et al., 2018).

As students with dis/abilities are being included at a higher rate across both PK-12 and higher education settings, it is important that approaches to inclusive education be strengthened. I propose UDL as an effective approach to addressing the needs of all students. Novak and Bracken (2019) posit that “only when our HEIs are universally designed to meet the learning requirements of all learners will student graduates realize their true learning potentials” (p. 3).

### **National Context**

Following global trends, the United States has seen an increase in the number of students with dis/abilities entering higher education (Fleming et al., 2017; Hartsoe & Barclay, 2017; Lombardi & Murray, 2011; Madaus et al., 2021). Alarming, students with dis/abilities are graduating at a lower rate than their peers without disabilities (Lightfoot et al., 2018). Therefore, it is critical that an effective approach to educating students with dis/abilities in higher education settings be implemented.

Students with dis/abilities in a higher education setting face challenges unique to the higher education setting. For example, they must self-disclose their dis/ability status in order to request accommodations (Hsiao et al., 2019; Madaus et al., 2021; Matthews, 2009; Quinlan et al., 2012), whereas in a PK-12 setting, there are systems in place to proactively identify students that may have a dis/ability. It is evident that students with dis/abilities are choosing not to disclose their dis/ability status to their instructors or

HEIs. Quilan et al. (2012) reported that only 0.7% of students in higher education disclosed having a learning dis/ability, while an estimated 10% to 35% of the population is suspected of having a learning dis/ability. Students with dis/abilities may be hesitant to reveal their dis/ability status to the institution or their instructors for a myriad of reasons, including concerns about judgment from their professors (Kreider et al., 2015; Mathews, 2009). The gap between the number of higher education students with a dis/ability and the number of higher education students reporting their dis/ability creates the need for proactively designed instructional practices to support all students.

Fortunately, the Higher Education Opportunity Act of 2008 (HEOA) calls for the use of UDL (Higher Education Opportunity Act, 2008; Rao, 2019).

UDL is a framework centered on strategically designing instructional practices to mitigate barriers to success that may be encountered by students while building on students' strengths, experiences and interests to develop expert learners ([Center for Applied Special Technology] CAST, 2018). A key characteristic of UDL is that the instruction, assignments, assessments, and materials are not retrofitted based on a student's need due to a dis/ability. Instead, flexibility and scaffolding are built into the design and can benefit all students (Posey & Novak, 2020), thus reducing the need for students to self-disclose their dis/ability status.

### **Situated Context**

As of spring 2022, MLFTC has just over 350 students have disclosed to ASU's SAILS department that they have a dis/ability and require accommodations (Price, 2022). The SAILS staff are tasked with supporting students through the process of "establishing eligibility and beginning the interactive process to determine accommodations" (Arizona



State University, n.d., n.p.) upon students completing a registration form with the SAILS office. Services provided through SAILS are designed to support students in identifying barriers to access and recommending accommodations to support access. This system has two key flaws: students must self-disclose their dis/ability status and accommodations are focused on access only with limited consideration of meaningful engagement. It is evident that a more comprehensive approach is needed (Lightfoot et al., 2018).

Nationally, only a small portion of the students who would benefit from instructional accommodations disclose their dis/ability status (Quilan, et al., 2012). Therefore, instructional practices designed using the UDL framework are imperative, as the proactive nature of UDL does not require faculty to know which of their students have a dis/ability. I posit that faculty collaboration to operationalize the UDL framework within their specific context will support students with dis/abilities in meaningfully engaging with the curriculum.

### **Problem of Practice**

The problem of practice that motivates this AR study is that students with dis/abilities are entering higher education at increasing rates, yet they are not experiencing the same academic success as their peers (Kreider et al., 2015; Lightfoot et al., 2018). Further, students are required to disclose their dis/ability in order to receive formal accommodations. UDL provides an effective framework for proactively addressing the barriers to learning that are present in higher education classrooms.

Realizing meaningful and sustained change in instructional practices is challenging and requires a thoughtful and evidence-based approach. Faculty collaboration centered on how to operationalize the principles of UDL in practice may support meaningful integration of these practices.

Educators routinely engage in professional development activities, yet professional development often does not create lasting change in instructional practices (Darling-Hammond et al., 2017) when it is not designed to be focused and coherent (Desimone & Garet, 2015). Darling-Hammond et al. (2017) identified seven key elements of effective professional development; these elements include professional development which (a) is content focused, (b) incorporates active learning, (c) supports collaboration, (d) uses models of effective practice, (e) provides coaching and expert support, (f) offers feedback and reflection, and (g) is of sustained duration. This AR study will focus on the element of faculty collaboration. I selected this element as it presents a mechanism for potentially supporting integration of UDL and collaboration could be continued by the faculty beyond the scope of this study. The following section will detail how collaboration will play an integral role in the proposed innovation.

### **Innovation**

This AR study focused on faculty teaching lower division cohorts at ASU's MLFTC. Targeting lower division faculty is strategic, as the lower division faculty currently have a professional learning community structure designed to help them support cohorts of freshman and sophomore students. Additionally, introducing the principles of UDL and its focus on developing expert learners has the greatest potential for impact when introduced to students early in a student's college career. The professional

development series included two components: (a) asynchronous online modules and (b) Innovation Configuration (IC) map design sessions.

The asynchronous online modules provided foundational information regarding the concept of expected learner variability, the structure of the UDL framework, and detailed information on the principles of UDL. Participants will engage with three asynchronous online modules, each focusing on one UDL principle. See Appendix C for additional details on the content and materials. The asynchronous modules are also described in more detail in chapter three.

The IC map design sessions provided a structured mechanism for faculty to collaborate and reflect on how the implementation of the UDL framework should look in the lower-division program. The IC map process is one of the three components of the Concerns-Based Adoption Model (CBAM). CBAM focuses on the science of change and includes three components: Stage of Concern (SoC), Level of Use (LoU), and Innovation Configuration (IC) map (Olson et al., 2020). In this AR study, I focused on faculty co-development of an IC map. I chose to use an IC map for two reasons. First, IC maps acknowledge implementation as an iterative process in need of ongoing reflection and refinement. Second, an IC map provides explicit descriptions of instructional strategies that are “visual and action oriented” (Hall & Hord, 2015). Hall and Hord (2015) explain that “many change efforts fail because the participants do not share mental images of pictures of what classroom and/or school practice will look like when the identified change is implemented to a high quality” (p. 31). Therefore, I believe that when faculty co-develop an IC map, the integration of UDL aligned practices will be more consistent and thoughtful.

## **Purpose of Study**

The purpose of this study is to understand how faculty collaboration may influence their disposition towards implementing the UDL framework. Though there are multiple definitions of disposition, for the purpose of this study, *disposition* has been influenced by Hall and Hord (2015), and is defined as beliefs that influence an individual's actions. Additionally, I will gather data about the role that co-developing an IC map supports faculty in operationalizing the UDL principles in their courses. For the purposes of this study, the term *operationalize* is defined as creating observable instructional tasks and activities based on a principle, guideline or checkpoint from the UDL framework.

## **Research Questions**

The research questions (RQ) guiding this AR project are:

- (1) In what ways do faculty co-construct knowledge around operationalizing the principles of UDL in a higher education setting?
- (2) How does collaboration between higher education faculty influence their disposition regarding the integration of UDL in a higher education setting?
- (3) How does higher education faculty collaboration support integration of UDL?

## CHAPTER 2

### THEORETICAL PERSPECTIVES AND CONCEPTUAL FRAMEWORKS GUIDING

#### THIS STUDY

UDL-based pedagogy fits perfectly with the spirit of higher education in its emphasis on catering to a diverse population of students, teaching students to be reflective thinkers and master learners, and embracing innovative techniques and technologies.

(Laist et al., 2022, p. ii)

AR is an iterative and adaptive process designed to build upon prior knowledge and emphasizes applying that knowledge in situated contexts (Mertler, 2020). Therefore, an essential activity in developing this AR study was completing a literature review to understand the existing research base, including the use of theoretical and conceptual frameworks. In this chapter, I will explain how I leveraged the existing theoretical and conceptual frameworks to guide this study. First, I will describe the application of two theories, socio-cultural learning theory (SCLT) and Critical Disability Studies (CDS). Next, I will describe a conceptual framework, Universal Design for Learning (UDL), guiding this AR project. Further, I will identify specific examples of research that utilized these theories and have informed my approach.

#### **Socio-Cultural Learning Theory**

SCLT is focused on the ways in which social interactions act as a driver of learning, which may lead to behavior change (Billett, 2008; Knapp, 2008). Vygotsky (1978) examined how an individual's interactions are pivotal in shaping their identity, including their beliefs and subsequent actions. Identity is formed in a relational context (Bucholtz & Hall, 2005; Rodgers & Scott, 2008); an individual's social interactions and experiences shape their disposition. Further, SCLT acknowledges the influence of

interaction on both individual and collective learning. For example, in a work setting when learners identify patterns of behavior in their colleagues and assimilate those patterns into their own patterns of behavior (Kahlke et al., 2018), they demonstrate new learning which is reflected in the evolution of organizational culture (Knapp, 2008).

Attention must be given to higher education faculty members' beliefs about integrating inclusive practices to support students with dis/abilities, as faculty attitudes influence their use of inclusive strategies (Black et al., 2014). It should not be assumed that higher education faculty have developed a positive disposition towards the use of inclusive practices (Lombardi & Murray, 2011; Murray et al., 2009). Faculty will need time and opportunity to engage in co-reflection with their colleagues on their beliefs, attitudes, and instructional practices related to supporting students with dis/abilities (Van Huizen et al., 2005). When professional development and opportunities for reflection are absent, faculty may continue or revert to exclusionary instructional practices (Gonzalez-Castellanos et al., 2021). For example, instructional strategies common in higher education, such as high-stakes testing and lengthy lectures, may exclude some students from meaningful access to the curriculum (Rose et al., 2006).

SCLT informed my approach to this AR study, as it influenced my design to emphasize faculty collaboration during the implementation of the innovation. The emphasis on faculty-to-faculty collaboration meets two distinct and essential needs. First, collaboration creates opportunities to co-develop knowledge and shared understanding of inclusive instructional practices, which increases agreement on use of these practices leading toward acceptability and social validity (Huang et al., 2021). Second, collaboration provides an opportunity for faculty to operationalize new frameworks or

approaches in their teaching. Operationalizing a new framework may include discussions about how to: (a) effectively capture the framework in syllabi, (b) adjust materials, such as reading and lectures, and (c) use the principles of UDL to guide grading processes. Operationalizing the UDL principles has proven to be complex (Rose et al., 2006). Faculty collaboration supports that complex process by providing a space to share effective practices and brainstorm specific strategies for meeting context-specific challenges.

In the context of this AR study, faculty collaboration played a pivotal role, which has been influenced by SCLT. The faculty-to-faculty collaborations embedded in this AR study provided three distinct opportunities for faculty interactions through three Innovation Configuration (IC) map design sessions. These structured and intentional opportunities for collaboration may lead to a disposition supporting the use of inclusive practice and the co-construction of new knowledge about operationalizing UDL in a higher education setting.

### **Critical Disability Studies**

CDS expounds upon disability studies and calls for critical examination of the impact of social expectations on definitions of ability and dis/ability (Goodley, 2018). Social expectations such as demonstrating engagement in a classroom through giving visual attention to the instructor or providing verbal answers may not acknowledge other means of engagement. What may be termed a dis/ability by social norms, may actually represent a mismatch between the individual and the environment. CDS further draws on critical social theory and critical feminist theory, as such CDS acknowledges the intersection of dis/ability status with other markers of identity (e.g., gender, race, socio-

economic status) that impact an individual's experience within social and political systems (Goodley et al., 2019), including the higher education system. Additionally, CDS calls for individuals to move past examining the oppression inherent in societal structures that utilize "normative ideologies" (Minich, 2016) and take a stance of advocacy for and with individuals with dis/abilities (Goodley et al., 2019). Further, Minich (2016) proposes that CDS can be viewed as a theoretical framework and methodology, not simply an area of study. Thus, CDS offers a method for faculty to critically evaluate their own attitudes about dis/ability and their actions in the classroom (Goodley, 2018) and consider the impact of adopting a learner-centered focus.

Critical Disability Studies (CDS) informed my approach to this AR study. First, I choose to use the term dis/ability in order to highlight "the socially constructed system of norms which categorizes and values bodyminds based on concepts of ability and disability" (Schalk, 2017, para. 3). CDS also prompted me to reflect on the ways in which higher education settings are often designed to meet the needs of the average learner (Rose, 2016). For example, in many college courses, lectures and textbooks are the primary mechanism for sharing content with students (Rose et al., 2006). These strategies often assume skills, experiences, and interests aligned to the dominant culture. Therefore, it was important to identify a means for proactively planning for learner variation. Additionally, CDS's emphasis on including individuals whose voice has not historically been included, influenced my decision to include undergraduate students in cycle one of this AR study.

CDS plays a key role in this study, because it informed the decision to emphasize a proactive approach to planning inclusive instructional practices. In the following



section, I propose UDL as an anecdote to the deficit model of viewing dis/ability, as it increases access and opportunity for all students. The premise of UDL is that learner variation should be expected and that instructional practices should be proactively designed to meet the needs of all learners.

### **Universal Design for Learning**

UDL is a framework that is used to support education systems in moving towards a more equitable environment for all learners, including those with a dis/ability (Fovet et al., 2014). UDL emphasizes that learner variation is to be expected (Posey & Novak, 2020; Xie & Rice, 2020) and promotes creating an environment that is accessible to all (Black et al., 2014). UDL is both a philosophy that guides how instructors conceptualize their instructional approach and a practical framework that supports operationalizing the philosophy.

The UDL structure includes three principles; (a) providing multiple means of engagement, (b) providing multiple means of representation, and (c) providing multiple means of action and expression (CAST, 2018; Rose et al., 2006). These principles are rooted in the belief that variation in learners' knowledge, skills, interests and experiences is to be expected (Posey & Novak, 2020); therefore, instructional planning should seek to proactively address learner variation. Each of the UDL principles contains three associated guidelines, which help to ground the principles in actionable methods that can be integrated into instructional strategies. See the UDL guidelines in Appendix B. The goal of implementing the UDL guidelines is to develop expert learners (CAST, 2018). Each of the three principles has associated traits of expert learners as described below.

The principle of providing multiple means of engagement emphasizes developing expert learners who are purposeful and motivated. This principle incorporates three guidelines; providing options for (a) recruiting interest, (b) sustaining effort and persistence, and (c) self-regulation (CAST, 2018). This principle is designed to address the “why” of learning by drawing on learners’ past experiences and capitalizing on areas of interest (e.g., offering a list of relevant topics for students to choose from). This principle also seeks to leverage student interest to help them persist through challenging tasks and take risks as a learner. Higher education faculty can recruit student interest by making explicit connections between the course content and students’ future careers and supporting students in using effective strategies to reflect on their own learning.

The principle of providing multiple means of representation emphasizes developing expert learners who are resourceful and knowledgeable. This principle incorporates three guidelines; providing options for (a) perception, (b) language and symbols, and (c) comprehension (CAST, 2018). This principle is designed to focus on the content or “what” of learning by ensuring that content is easy to access (e.g., enlarged print) and that comprehension is supported. For example, higher education faculty may support student comprehension by explicitly defining key terms and/or creating a shared-class glossary. Additionally, this principle calls for content to be provided in a variety of modes (e.g., lecture, video, guest speakers, and class discussion; Black et al., 2014).

The principle of providing multiple means of action and expression emphasizes developing expert learners, who are strategic and goal oriented. This principle incorporates three guidelines; providing options for (a) physical action, (b) expression and communication, and (c) executive functions (CAST, 2018). This principle is focused

on the approach or “how” of learning. Higher education faculty can teach students to effectively select and use tools (e.g., databases), as well as how to set goals for themselves as learners.

UDL played an important role in this AR study, given the increasing number of students entering higher education who identify as having a dis/ability (Rao, 2019). As students in higher education are not required to self-disclose their dis/ability status (Hsiao et al., 2019; Madaus et al., 2021; Matthews, 2009), UDL offers an exceptional opportunity to provide support for all students reducing the need for self-disclosure to receive specialized accommodations. UDL also offers a flexible mechanism for higher education faculty to identify the most effective and acceptable inclusive strategies for their unique context.

### **Professional Development and Organizational Change**

Given the increased participation of students with dis/abilities in higher education (Lombardi & Murray, 2011; Rao, 2019), it is clear that HEIs need a culture of inclusion. SCLT, CDS and UDL work together to provide a framework for developing a shared understanding that supports use of inclusive practices in the classroom through a shift in organizational culture. I further illustrate the potential effectiveness of faculty collaboration for influencing faculty disposition and organizational culture with examples from education settings. Additionally, I present findings from my initial cycle of research which informed the current cycle of research.

Leaders, researchers, and advocates of school reform have considered the implication of SCLT on large scale reforms directed at improving instructional practices at the PK-12 level (Gonzalez-Castellano et al., 2021). For example, the implementation

of the No Child Left Behind (NCLB) Act prompted a wave of professional development aimed at improving teachers' instructional abilities (Knapp, 2008). PK-12 school districts have conceptualized the use of SCLT by creating structures such as expert-novice dyads (Thorne & Hellerman, 2015) and studio/residency programs (Gallucci, 2008). Both Thorne and Hellermann (2015) and Gallucci (2008) found that the focus on supportive and ongoing interactions built motivation for faculty to implement new instructional strategies.

Research related to the implementation of UDL in higher education spaces has been late-in-coming compared to PK-12 spaces. Yet, higher education is an important context to study given both the increased number of students with dis/abilities, as well as federal mandates for HEIs to use UDL (Higher Education Opportunity Act, 2008). Organizational culture influences the actions, including instructional methods, routinely adopted by its members. In the higher education context, Englund et al. (2018) stated, “the culture of a particular community, such as a department or programme, is continually (re)-constructed and maintained as members act and interact, change and are changed by the community” (p. 1053). Englund and colleagues collected data from 24 higher education faculty members teaching in an online master in pharmacy program in Sweden over a 12-year period. They found that the culture of programs had a strong influence on how faculty interacted with one another and what activities were most valued. For example, some programs prioritized teaching over research, which influenced the behaviors of the faculty within that department (Englund, 2018). Additionally, Rose et al. (2006) described the influence of the higher education context on instructional strategies. For example, higher education classrooms often utilize readings and lectures

to convey information. However, Rose et al. (2006) encouraged adapting expected instructional strategies to support a wider variety of learners. For example, they suggest establishing a structure of shared notetaking, which supports students by providing notes while also modeling diverse approaches to taking notes (e.g., outline, visuals).

In the context of a teacher preparation program, Peck et al. (2009) spent 18 months examining the ways in which both individual and collective change influenced the implementation of a wide-scale program revision. They found that change happened both at the individual level, as well as collectively at the level of small and large groups. Peck and his colleagues noted that creative activities at the individual level were often shared and spread through faculty interaction.

The existing research points to the potential for intentional faculty collaboration to support change in instructional practices by influencing both faculty disposition, as well as the culture of the program or department.

### **Initial Cycle of Research**

Cycle one of this AR study focused on gaining a better understanding of student-faculty dialogue. Education Journey Mapping (EJM) was used as a mechanism for soliciting high-quality dialogue between students and faculty. EJM is a critical qualitative research method established by Annamma (2018). Annamma's research focused on girls of color with dis/abilities in juvenile detention centers. However, Annamma's (2018) approach is designed to "provide an opportunity for historically oppressed students to share 'counter-cartographies,' ones that challenge dominant representations of the world" (p.23). Given this focus, EJM presents an opportunity for students with dis/abilities to share their stories and engage in critical dialogue with higher education faculty. EJMs

provide a structure to show the development of a journey over time and share the “people, places, obstacles, and opportunities” encountered (Annamma, 2017, p. 39).

Three undergraduate students and two higher education faculty from the college participated in cycle one of this study. Convenience sampling was used and students were not asked to disclose their dis/ability status during the recruitment phase. Participants engaged in a process of creating an EJM and were given the opportunity to verbally expand upon their EJM. The activity was conducted virtually, due to COVID-19 related safety precautions implemented by the university review board.

Participants were given the following prompt and provided with 15 minutes to create their EJM.

Map your education journey from when you started school to now. Include people, places, obstacles, and opportunities on the way. Draw your relationship with school. You can include what works for you and/or what doesn't. You can use different colors to show different feelings, use symbols like lines and arrows or words. These are just suggestions. Be as creative as you like and, if you don't want to draw, you can make more of a flow-chart. Afterward, you will get a chance to explain it to me (Annamma, 2017, p. 39).

All participants ( $n=5$ ) choose to verbally explain their EJM when given the opportunity. Participants were presented with the option to ask questions of one another or make connections, as they reflected on the EJMs.

Data were collected through a post-intervention survey and one-on-one interviews. The survey consisted of five demographic questions and 10 questions exploring two constructs: (1) the effectiveness of educational journey map activity and

(2) the effectiveness of faculty-student dialogue. The survey used a six-point Likert scale. Survey data were collected from five participants using a Google form. The respondents included three students and two faculty members. In addition to survey data, interview data was collected. One student and one faculty member were interviewed. The interviews were conducted via Zoom one day after the intervention. A semi-structured interview approach was used. Interviewees were asked about their typical student-faculty interactions, perceived effectiveness of EJMs to support conversations, and suggested revisions to the EJM structure.

Data collected from participants showed that students and faculty routinely engaged in conversation. However, the conversations most often related to course material, assignments, and accommodations. Both interview and survey data indicated that the EJM activity prompted dialogue around new topics, including important people and events in the participants' education journey. All participants ( $n=5$ ) indicated that they strongly agreed or agreed that student-faculty dialogue can influence instructional practices, which aligns with previous research showing the student-faculty dialogue "often leads to increased awareness amongst instructors and a willingness to explore UDL" (Fovet et al., 2014, p. 72). A second relevant finding is that during the EJM work session, all three of the undergraduate students discussed challenges related to their mental health. Yet, all three students indicated that they do not identify as having a dis/ability when completing the post-intervention survey.

Based on the findings from cycle one of this AR project, I recommend that faculty take a proactive approach to designing their instruction that accounts for the learner variability likely present in their classroom. Both student and faculty participants in cycle

one indicated that little time is provided for faculty to gain a deeper understanding of the varied experiences, interests, and skills with which students enter the classroom.

Additionally, students did not identify as having a dis/ability though they did address mental health concerns which indicates they may have an undiagnosed dis/ability. Given these two factors, students may be experiencing barriers to their academic success which could be mitigated by implementing instructional practices aligned with the UDL principles.

### **Summary**

Given the increase in the number of students with dis/abilities entering HEIs, as well as the self-disclosure requirement, I believe it is important to proactively design instructional opportunities to support all students. Thus, reducing the need for students to self-disclose their dis/ability to receive accommodations to support their learning (Matthews, 2009). UDL offers an effective mechanism for proactively planning for expected learner variation (Posey & Novak, 2020). In the next chapter, I will detail the following cycle of this AR study, including the role of collaboration in supporting faculty members' knowledge of UDL and integration of UDL aligned strategies in their instructional practices.



## CHAPTER 3

### METHODS

#### **Introduction**

In chapter one, I described the need for increased integration of inclusive instructional practices in higher education settings, due to the growing rate of students with dis/abilities entering higher education (Lombardi & Murray, 2011). In addition to dis/ability status, students entering HEIs come with a wide range of skills, knowledge, interests and experiences. Therefore, learner variation should be expected (Posey & Novak, 2020) and instructional practices should be proactively designed to support all students.

In chapter two, I described two theoretical approaches, Sociocultural Learning Theory (SCLT) and Critical Disability Studies (CDS), used to guide the design of this study. SCLT informed the collaborative approach that will be employed; while CDS supported the need to include opportunities for critical evaluation and reflection of how dis/ability is viewed in the higher education context. Additionally, I described the use of UDL as a conceptual framework for integrating inclusive practices. UDL provides both a philosophical stance towards inclusion, as well as practical guidelines for developing and implementing inclusive instructional practices.

In the following chapter, I will describe AR and provide the context for the next cycle of this AR study, including the background, setting, participants, and researcher's role. Then I will describe the proposed innovation and data collection methods.

## **Action Research (AR)**

AR research is focused on investigating a Problem of Practice (PoP) within a researcher's immediate context and enacting an intervention or innovation that will improve conditions. The researcher's close proximity to the PoP supports a focus on the practical rather than the theoretical in AR (Herr & Anderson, 2005). One consequence of the focus on the practical is that AR is a very adaptive process (Mertler, 2020), which gives rise to cycles of inquiry within an AR project. Another key characteristic of AR is the embedded nature of the researcher.

This AR study is important to me, as I have observed the need for inclusive instructional strategies in a higher education setting firsthand. This has led me to believe that addressing the effect of invisible dis/abilities in the classroom is urgent. My students have reported elevated feelings of stress over prolonged periods of time. Additionally, students have disclosed that they have anxiety, either formally diagnosed or based on self-assessment. The reasons contributing to their stress and anxiety are varied, but it is evident that it affects them in the classroom (U.S. Department of Health and Human Services, 2021). For example, students experiencing anxiety may have increased difficulty with their memory and consequently have trouble answering questions in class or engaging in class discussions (AlKandari, 2019).

I am not approaching this AR study from a position of neutrality; my experiences have informed my position. I am a strong advocate of the use of inclusionary instructional practices and believe that individual variation should be expected and embraced. This foundational belief has shaped my approach as an educator and scholar; the focus of my work is on collaborating with pre-service and in-service teachers to

ensure high-quality educational opportunities are available to all students, regardless of gender, dis/ability status, class, or country. I use a CDS lens to consider ways in which educators, school settings, and school systems can adapt to meet the needs of a diverse student population. Further, I believe that education policies and practices should be designed to meet the needs of all learners, with consideration to their own unique knowledge, skills, experiences, and interests.

The purpose of the AR study is to better understand how collaboration supports the integration of inclusive strategies in higher education. I posit that when higher education faculty work collectively to learn about and integrate inclusive strategies in their instructional practices there is a strong possibility of influencing individual dispositions towards inclusive practices, cultural norms around acceptable teaching practices, and sustainability of implementation.

I am specifically seeking to know: (a) what ways do faculty co-construct knowledge around operationalizing the principles of UDL, (b) how does collaboration between higher education faculty influence their disposition regarding the integration of UDL, and (c) how does higher education faculty collaboration support operationalizing instructional practices aligned to the principles of UDL?

### **Setting**

#### **Arizona State University**

The setting for this AR study is Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU), a large research institution in the United States Southwest. This setting was chosen as it is my work site. However, independent of that fact, it is an excellent setting for this AR study, as the university has a mission driven by

who they include and how they help them succeed (Arizona State University, 2014).

Given their mission, the university has a student body with a variety of skills, knowledge, experiences, and interests including a large number of students with dis/abilities.

### **Mary Lou Fulton Teachers College**

This AR project was conducted within ASU's MLFTC. The college had 3,217 students enrolled in undergraduate courses in fall 2021 (ASU Data Warehouse, 2022). In the spring of 2022, 350 students from MLFTC enrolled with SAILS in order to request accommodations to support their success in the higher education classroom (Arizona State University, n.d.).

### **Situated Context**

This study was implemented with faculty in the lower division program at MLFTC. Lower division refers to the first four semesters of a student's college experience for those students entering the university as freshmen. The lower division courses in the college are cohorted, meaning that students attend all of their education courses with the same classmates. The cohort structure supports faculty collaboration, as they provide instruction and support to the same cohort(s) of students. Therefore, there is an authentic need to discuss students' progress and potential supports. For the 2022-2023 academic year, the lower division program included nine full-time faculty members.

The lower division faculty cohort was selected as the context for this study for three key reasons. The lower division faculty have a history of working collaboratively. They meet approximately one time per month. Additionally, given that their students are cohorted, consistent and ongoing collaboration around student support is embedded within the existing structure. Finally, the faculty members are working with students

early in their college career. Hence, supporting the development of expert learners in the early years will provide support throughout their time at MLFTC.

### **Role of the Researcher**

I am a clinical assistant professor in MLFTC and have taught lower division coursework in the past. However, during the timeframe of this study, I was not teaching lower division courses, nor did I have any oversight of the lower division program or faculty. I do have an established relationship with some of the lower division faculty members due to previous projects and collaborations within the college.

Though I am not currently teaching in the lower division program, I am still connected to the lower division structure as some students will matriculate into the Early Childhood Special Education (ECSE) program in which I currently teach. I believe that by teaching lower division students to use the skills of an expert learner, they will realize greater success when they enter the ECSE program or any other upper division program.

### **Innovation**

The purpose of this study was to better understand how faculty collaboration supports faculty members' disposition toward integrating inclusive instructional practices into their teaching and how collaboration influences the culture of the department. The innovation for the AR study had two key components: (a) asynchronous online professional development modules and (b) the co-development of an IC map. For more information, see the timeline in Appendix A.

## **Asynchronous Modules**

The asynchronous online professional development modules were designed to provide a foundational understanding of the UDL principles while modeling their use. For example, participants were able to access the content in a video or audio format or as a written transcript in alignment with UDL checkpoint 1.1, “Offer ways of customizing the display of information” (CAST, 2018). Illustrations of UDL principles being implemented came from higher education settings, increasing the likelihood they will be useful to higher education faculty in alignment with UDL checkpoint 7.2, *optimize relevance, value, and authenticity* (CAST, 2018). Additionally, professional development modules were designed with potential constraints for faculty in mind. For example, each of the asynchronous online professional development modules was less than 30 minutes of core content in order to be mindful of participants' time. These modules were housed in Canvas, a learning management system (LMS) with which participants were familiar.

The first session set the stage for participants by providing an overview of the UDL approach including: the concept of expected variation, the focus on developing expert learners, and the structure of the UDL guidelines. The first session also addressed the *principle of multiple means of engagement* and how it supports developing purposeful and motivated expert learners. The three guidelines associated with this principle were described: (a) recruiting interest, (b) sustaining effort and persistence, and (c) self-regulation (CAST, 2018). In addition to defining the principle and checkpoints, this asynchronous online professional development model gave explicit illustrations of how this principle and associated guidelines can be operationalized in a higher education setting. For example, a case study highlighting the use of shared student lecture notes

(Rose et al., 2006) was used to illustrate one-way higher education faculty can foster collaboration and community in alignment with UDL checkpoint 8.3 (see Appendix B; CAST, 2018)

The second session focused on the *principle of multiple means of representation* and how it supports developing resourceful and knowledgeable expert learners. The three guidelines associated with this principle were described: (a) perception, (b) language and symbols, and (c) comprehension (CAST, 2018). Again, the emphasis was on providing explicit illustrations of how this principle and associated guidelines can be operationalized in a higher education setting. This asynchronous module provided an example of how one faculty member used audio feedback to provide students with feedback on their course assignments (Alsalamah, 2020) in alignment with UDL checkpoint 1.2, *offer alternative auditory information* (CAST, 2018).

The third session focused on the *principle of multiple means of action and expression* and how it promotes the development of strategic and goal-directed learners. The three guidelines associated with this principle were described: (a) physical action, (b) expression and communication, and (c) executive functions (CAST, 2018). Examples for operationalizing multiple means of action and expressions were illustrated. Examples of higher education faculty providing creative final products (e.g., podcast, flyers, pictures, graphs) for students to show what they have learned were shared in alignment with UDL checkpoint 5.1 (See Appendix B; Brewer, 2022; Smith, 2022).

### **Innovation Configuration (IC) Map Design Sessions**

Following each asynchronous session, faculty members engaged in an IC Map design session to define what successful integration of the targeted UDL principle could

look like in the college's lower division courses. An IC map is a tool used to define the practices that are expected to be observed when an innovation is effectively implemented (Hall & Hord, 2015; Kistler & Baird, 2018). Given the dual function of UDL as both a philosophy as well as an instructional approach, the co-development of an IC map is a strategic mechanism to operationalize UDL in a specific context. A collaborative process for developing an IC Map is recommended (Hord et al., 2013), as it constitutes a “valuable form of professional development” when implementing an innovation (Kistler & Baird, 2018) by providing a mechanism for making the co-construction of knowledge concrete.

A sample template for the IC map was shared with participants during the first design session. The template can be viewed in Appendix F. The participants were encouraged to collectively adapt the template (e.g., change the number of options on the scale, revise the headings) to meet the needs of their context (see Appendix E). During each IC Map design session, participants were provided with the following prompt both verbally and in writing.

During the next five minutes, I would like you to take a moment and reflect on the learner variability you typically see in the lower division courses and the potential strengths you can leverage and challenges that may need to be addressed. Then consider the UDL principle of multiple means of engagement/representation/action and expression and what you would like to observe happening in lower division courses to support the principle of multiple means of engagement/representation/action and expression. Then simply record



those observable actions on the IC map, keeping in mind that we are looking at stages of implementation, not a “perfect” UDL classroom.

After individually brainstorming evidence of implementation for the IC map, participants were asked to share and discuss their recommendations. Recommendations were combined, altered, or discarded as the group came to a consensus. At the end of each IC map design session, the evidence of use for one UDL principle was drafted. After each session, I consolidated the strategies generated and reviewed their alignment to the UDL checkpoints. The participants were then prompted to review and revise the previously drafted section of the IC map.

### ***Definition of Terms***

The research questions and related data collection and analysis described below use the definitions in Table 1.

**Table 1**

#### *Research Questions: Related Terms*

Term	Definition
Disposition	The beliefs which influence an individual’s actions.
Operationalize	Creating observable instructional tasks and activities.
Co-construction	Two or more individuals crystalizing their understanding of a concept or idea through dialogue.

### **Data Sources and Collections Methods**

I used a mixed method action research (MMAR) approach for this study. I selected this approach in order to gain a better understanding of the degree to which professional development coupled with faculty collaboration influenced change in lower

division faculties' use of inclusive practices aligned to the principle of UDL, as well as how these activities influenced faculty disposition. The data sources and analysis methods used to address the research questions are listed in Table 2.

**Table 2**

*Research Questions and Data Collection Instruments*

Research Questions (RQ)	Data Collection Instrument	Data Analysis Method
In what ways do faculty co-construct knowledge around operationalizing the principles of UDL in a higher education setting?	Design Session Recording Interview Development - IC map	Recording analysis, Document analysis,
How does collaboration between higher education faculty influence their disposition regarding the integration of UDL in a higher education setting?	ITSI-R	Descriptive Statistics
How does higher education faculty collaboration support integration of UDL?	Observation - IC map	Document analysis, Thematic coding

**Quantitative data collection**

Quantitative data was collected using the Inclusive Teaching Strategies Inventory-Revised (ITSI-R).

***Pre and post inventory***

Participants completed the ITSI-R (see Appendix D) prior to participating in professional development activities and again at the conclusion of the study (see Appendix A). The ITSI-R is a revised version of the inventory, which was developed, tested, and refined by Lombardi and Murray (2011; Lombardi et al., 2011; Lombardi et al., 2015). The ITSI was designed to measure higher education faculty members' attitudes

towards inclusive practices, as well as their implementation (i.e. actions) of these practices (Lombardi et al., 2015). The ISTI was selected as the basis for the pre and post inventory due to its capacity to measure both attitudes and actions; therefore providing an understanding of faculty members' disposition. Additionally, Lombardi et al. (2011) demonstrated the ITSI's validity and reliability. Their analysis demonstrated internal consistency between indicators within each of the constructs. Reliability was measured using Cronbach's alpha ( $\alpha$ ), which showed "preferable reliability" with a range between .70 and .89 across all of the subscales (Lombardi et al., 2011).

The ITSI was slightly revised for use in this study. Two constructs, Disability Law & Concepts and Course Modifications, were removed, as the professional development provided was not designed to address either of these concepts. Additionally, references to the learning management system, Blackboard, were replaced with Canvas, as the participants in this study were using Canvas. The ISTI-R includes five constructs: (a) accommodations, (b) accessible course materials, (c) inclusive lecture strategies, (d) inclusive classroom, and (e) inclusive assessment. Each construct contains between four and nine items. Two separate sentence stems are used for each item, one aligned to attitude and one aligned to action. Participants respond on a five-point Likert scale for attitude measures which use the sentence stem, "I believe it is important to". Participants respond on a four-point Likert scale on action measures which use the sentence stem, "I do" (see Appendix D).

### **Qualitative data collection**

Qualitative data was collected using a semi-structured interview, field notes from collaborative observations, and co-scored IC maps.

### ***Semi-structured interviews***

The purpose of the semi-structured interviews was to gain a deeper understanding of how co-developing an IC Map to operationalize UDL principles in the college's lower divisions program influences faculty members' use of UDL. Additionally, semi-structured interviews provided data related to how faculty collaboration builds agreement to support integration of instructional practices aligned to UDL.

Convenience sampling was used to complete interviews. All lower division faculty participating in this AR study were offered the opportunity to take part in an interview. Those who elected to participate in the interview process were interviewed in January 2023. The interviews ( $n=2$ ) took place face-to-face ( $n=1$ ) and via Zoom ( $n=1$ ), based upon the preference and availability of the faculty member. Interviews were recorded with faculty permission for later analysis. See Appendix E to review an interview guide which contains details related to the prompts and questions for the interview process.

### ***Design Session Recordings***

With consent from the participants, I recorded the IC map design sessions. The recordings were taken using Zoom technology. The recordings were then transcribed for analysis.

### ***Classroom Observation***

I conducted one classroom observation during the 2023 spring semester using the IC map co-developed during fall 2022. I attended a synchronous face-to-face class session and took field notes documenting the class materials (e.g., slide deck projected, handouts), written and verbal directions, and activities assigned (e.g., lecture,

assessments). Directly after the observation, the faculty member and I discussed the class session from a UDL perspective. We reviewed the field notes, as well as other evidence provided by the faculty member (e.g. explanation of previous directions or materials shared with students) and placed their instructional practices on the configuration that most closely aligns with the observation data. The scale on the IC map is intended to provide the faculty members with “judgment-free” information about their practices (Olson et al., 2020). It was not intended to serve as an evaluation. Instead it is intended to offer an opportunity for the faculty member to reflect on their classroom practices in a systematic way. Participation in these observations was made available to all lower division faculty members involved in this AR study. One faculty member elected to participate.

### **Data analysis**

Data was collected through a pre and post inventory, participant interview transcripts, the co-developed IC map, IC map design session recordings, and a collaborative observation. The data was analyzed using a MMAR approach.

### ***Co-construct of Knowledge***

Three types of data were collected and analyzed to better understand how developing an IC map supports higher education faculty in co-constructing knowledge related to operationalizing the principles of UDL. The data collection tools include recordings of the IC map design sessions, transcripts of interviews, and the co-developed IC map.

I used a thematic analysis approach (Braun & Clark, 2006) to analyze the data collected from transcripts of IC map design sessions and semi-structured interviews. This

thematic content analysis included three phases: immersion, reduction, and interpretation (Forman & Damschroder, 2008). I did not approach this thematic analysis using a predetermined set of themes. I specifically considered codes and themes that indicate when faculty were using a learner-centered focus in keeping with CDS. Codes are “the most basic segment, or element of raw data or information that can be assessed in a meaningful way regarding the phenomenon” (Boyatzis, 1998, p.63). Given the multiple dataset being analyzed, creating codes included a preliminary coding step. During the preliminary coding step, I created a code for elements presented a minimum of three times across the datasets. These codes were refined through a series of three repeated coding sessions in order to establish a codebook relevant and useful across the multiple data collection tools. Once the codebook was established, I coded all of the data collected from semi-structured interviews, IC map design sessions, and co-developed IC map. Then, I moved to the interpretation stage. During the interpretation phase, I sorted the codes into meaningful categories in order to identify themes in keeping with a thematic analysis approach.

I analyzed the co-developed IC map by completing a crosswalk between the IC map and the UDL guidelines. After each IC map design session, I reviewed the session notes and mapped strategies and recommendations to the checkpoints associated with the UDL principle focus for that session. Then I completed a crosswalk to map the instructional strategies developed by the faculty to UDL checkpoints, the most discrete level included in the UDL guidelines. In addition to the checkpoints listed on the UDL guidelines, I also utilized the examples provided by CAST (2018). For instance, checkpoint 7.1 *optimize individual choice and autonomy*, included “allow all learners to

participate in the design of classroom activities and academic tasks” as one of the examples (CAST, 2018). Multiple checkpoints may be associated with each instructional strategy. For the final analysis, I quantified the number of actions per checkpoint.

### ***Influence of Collaboration on Disposition***

Data were collected from a pre and post inventory and analyzed in order to better understand how collaboration between higher education faculty influences their disposition regarding the use of UDL in a higher education setting. The pre and post inventory were used to understand the degree of difference in faculty disposition towards integrating instructional strategies aligned to the UDL principles before and after they engage in a series of IC map design sessions. Pre and post inventory responses from the ITSI-R yielded 60 data points per respondent; indicators for attitude and action (2) for each of the five subscales (see Appendix D) for each administration (pre and post). Descriptive statistics were used to analyze the overall change in disposition and behavior after the three asynchronous PD sessions and three IC map design sessions.

### ***Collaboration to Operationalize UDL Principles***

Field notes taken during the classroom observation, as well as the co-scored IC map were evaluated using a deductive content analysis approach. Codes were predetermined based on the “visual and action oriented details” (Hall & Hord, 2015, p. 61) the faculty included in their co-developed IC map as they related to the expert learner traits listed in UDL guidelines (i.e., learners who are [a] purposeful and motivated, [b] resourceful and knowledgeable, and [c] strategic and goal oriented).

## **Ethical Considerations**

Faculty participation in this AR project was voluntary. However, I acknowledge that factors outside of the design of this AR project may influence faculty members' response to requests for engagement. For example, lower division faculty may feel obligated to participate due to their expected participation in other lower division meetings. They may be influenced due to their position (e.g. faculty title, years at MLFTC, type of appointment) relative to the other participants or myself as the researcher. In order to mitigate these potential outside factors, voluntary participation information was provided in writing and written consent was received from all participants. Additionally, faculty members were informed that they may withdraw from the project at any time without penalty. Given the personal nature of interviews and teaching observations, participants were able to self-select to take part in these activities. Internal Review Board (IRB) approval is included in appendix H.

## **Summary**

AR is a cyclical approach. Therefore, the findings from cycle one of this AR project have informed planning for the next cycle. During this cycle of this AR project, I (a) administered a pre and post inventory to measure faculty member's beliefs and actions towards the use of inclusive practices, (b) facilitated six professional development sessions (three online asynchronous modules and three IC map design sessions), (c) conducted one-on-one semi-structured interviews to better understand participants' perceptions of co-developing an IC map, and (d) conduct a classroom observation to better understand faculty members' level of implementation of strategies aligned to the UDL principles. This AR plan was designed to support my understanding of how faculty



co-construct knowledge around operationalizing UDL aligned strategies, how collaboration between higher education faculty may influence their disposition towards inclusive practices, and how faculty collaboration supports operationalization of UDL aligned strategies in higher education classrooms. These results and potential cycles of research will be presented in subsequent chapters.

## CHAPTER 4

### DATA ANALYSIS AND RESULTS

#### **Introduction**

The purpose of this study was to understand how collaboration, using a co-developed IC map and professional development activities, influences individual faculty member's disposition and use of inclusive instructional strategies. As a reminder, for the purpose of this study disposition is defined as belief that influences an individual's actions (See Table 2). The following research questions were used to guide this study:

- (1) In what ways do faculty co-construct knowledge around operationalizing the principles of UDL in a higher education setting?
- (2) How does collaboration between higher education faculty influence their disposition regarding the integration of UDL in a higher education setting? And
- (3) How does higher education faculty collaboration support integration of UDL?

#### **Co-constructing Knowledge Around Operationalization**

*In what ways do faculty co-construct knowledge around operationalizing UDL in higher education settings?*

Three data sources were used to gain a better understanding of the ways in which faculty co-construct knowledge around operationalizing UDL in higher education settings, including: transcripts from recordings of the IC map design sessions, transcripts from semi-structured interviews, and the final co-developed IC map.

#### **Thematic Analysis**

Thematic analysis was used to identify codes and themes from the IC map design session transcripts and the interview transcripts. Based on this analysis five themes

emerged: (a) current instructional strategies, (b) UDL terminology, (c) agreement, (d) permission, and (e) expected learner variation. The themes, codes and subsequent assertions are described below, as well as outlined in Table 3.

### ***Current instructional strategies***

It was evident from the IC map design sessions and interviews that faculty members used a range of inclusive instructional strategies. Although the prompt used when co-developing the IC map asked participants to consider what they would like to observe in their program, the majority of their dialogue focused on instructional strategies already used in their individual classrooms. For instance, several of the faculty members described ways in which they offer their students choice in assignments (UDL checkpoint 7.1). One faculty member stated, “EDT 180 has those [reflections], you can submit a written document, an audio recording and a video recording. Just kind of more options for them to turn in their reflections.” Another faculty member expanded on the idea of choice and explained how she provides students with options about the content of their assignments. She said, “Whatever project we’re doing, I let them pick [the content] whether it’s something of interest to them, whether it could be their future profession or an athletic program that they’re involved in, or whatever is a passion for them.” Another focus within the discussion was the variety of strategies faculty members employed to build community in their classrooms (UDL checkpoint 8.3). For example, they provided a variety of instructional strategies they use to support students working in groups (e.g., Kagan structures, jigsaw activities, and use of digital discussion tools [Yellowdig]).

Participants drew upon materials, tools, and training that were familiar. For example, several of the participants have had Kagan training and used the cooperative learning structures associated with Kagan.

### ***UDL Terminology***

Familiarity with UDL terminology emerged as a theme from the interviews. It empowered the interviewees ( $n=2$ ) in making instructional decisions and gave them the means to effectively articulate why they choose certain instructional strategies. Both shared that their involvement in this study positively impacted their ability and comfort with using UDL terminology to describe their instructional practices. They found it especially valuable as it empowered them to advocate for using innovative practices. One participant shared,

“when I was first introduced to UDL it was like I love this. I love that I had this language that I could wrap myself around then as we were creating the IC map part I felt like it was giving me a little more of a backbone to be able to defend my rationale and thought process.”

### ***Agreement***

When faculty members feel there is agreement on acceptable inclusive instructional strategies, they are likely to demonstrate increased confidence in implementing those strategies. Agreement focuses on to what extent the faculty members accepted an action or change by their peers. Analysis of the interview transcripts provided codes of agreement seeking and agreement giving. Agreement seeking occurred when faculty asked their colleagues if they also engaged in specific instructional strategies. For example, during an IC map design session when discussing community

building strategies, one faculty member asked if her colleagues have students who are “constantly sitting in little hubs” with the same group of classmates and, if so, do they employ strategies to “make them move around.” In response, two of her colleagues replied affirmatively. Further, faculty members demonstrated agreement with or endorsement of instructional strategies described by their peers by requesting materials from one another. For example, a faculty member requested a copy of a rubric one of her colleagues had described. The rubric was used by students to evaluate their participation in class. Additionally, faculty members engaged in agreement giving. Like in the above example, faculty members often confirmed one another’s instructional choices.

In contrast, when agreement is not perceived, confidence in implementing inclusive strategies lags. This is illustrated by a participant who described the difficulty she experiences when she does not perceive agreement with her colleagues on instructional strategies. She shared that she often feels tension between her strategies and the expectations of her peers, indicating that she believes she is perceived as too lenient. She also described how the co-development of the IC map supports the agreement between faculty members by “reaffirming” inclusive strategies as acceptable in the classroom.

## *Permission*

Perceived permission to flexibly adapt to learner's needs impacts faculty members' instructional decision making. Permission relates to a faculty member's feelings of being empowered by someone in a leadership position to implement a change or deviate from the initial plan (i.e., the syllabus). The college has established policies and procedures to ensure consistency between multiple sections of the same course, as well as to ensure that licensure requirements from the Arizona Department of Education (ADE) are met. For example, all faculty members are required to use the same established student learning outcomes (SLO), as well as common assessments in each course. They are required to seek permission from leadership (e.g., course coordinator, program lead) before making changes to these elements of a course. One interviewee shared her experience of seeking permission from leadership when she thought she needed to deviate from policies used in her freshman course. She explained that during that conversation, she was given permission to make changes in some areas, but not others (e.g., common assessments). The interviewee stated,

“[Previously] I didn't have a framework or permission to do that [make changes], and in some ways that's difficulty. Because I am a huge firm believer in being flexible. I'm a huge believer in product choice. I'm a huge believer in meeting people where they are, and I have found that I am often limited by the requirements of the syllabus.”

When faculty believe they have the flexibility to change the elements of the course, they feel empowered in their decision making.

### *Expected learner variability*

The final theme identified was expected learner variability. It was clear that faculty members were considering the impact of learner variability (i.e., unique experiences, skills, and interests) on their instructional choices. For instance, one interviewee stated, “I’m a huge believer in meeting people where they are.” The most common observation from faculty members was the lack of maturity in the students in lower division courses. One faculty member commented, “We have to remember...our students are just one year older than high school, so really, like maturity-wise there is not a big difference.” Several faculty members elaborated on how the students’ limited maturity impacted how students interacted with their classmates and their study skills. The faculty members explained that they have made adjustments to their instructional approaches to help build students’ maturity as learners by teaching them how to be strategic and goal-oriented. For example, one faculty member shared that she has added a structure to her course that supports students in both self-reflection and co-reflecting on their progress towards meeting the internship hours requirement. During class, she has them indicate their level of progress meeting the internship hour requirement, then divides them into small groups based on their progress to discuss strategies for making sure they are on target to meet the goal.

Both interviewees indicated that they discuss the need to consider expected learning variation with their colleagues, as well as their students. An interviewee shared that when students express concern over a perceived lack of fairness of flexibility offered to one student but not others, she would explain to them that everyone’s situations are different. An interviewee also specifically addressed the need to appreciate the different

experiences students bring with them to the classroom and not conflate experience with academic capacity. By acknowledging expected learner variation, interviewees were directly speaking to the underlying motivation for integrating learner-centered strategies.

**Table 3**

*Themes, Codes, and Assertions from IC map Design Session Transcripts*

Themes	Codes	Assertions
Current instructional strategies	Student choice Assessment design	Faculty members currently use a range of instructional strategies which support a variety of learners, including students with a dis/ability.
UDL Terminology	Rationale/support Connection to other theories/initiatives	Faculty members' familiarity with the UDL terminology may help them feel empowered to articulate why they use certain instructional strategies.
Agreement	Agreement Seeking Agreement Giving	Faculty seek agreement on acceptable instructional strategies to feel confident using them in their routine instructional practices.
Permission	Flexibility/Lack of Flexibility Restrictions	Perceived permission to flexibly adapt to learner's needs impacts faculty members' instructional decision making.
Expected learner variability	Meeting students' needs Setting realistic expectations Students' maturity level	When faculty members recognize the expected learner variation in their classroom, they are more likely to implement UDL aligned instructional practices.

### **Co-developed IC map**

The participants engaged in a series of three design sessions during which they defined instructional strategies aligned to the UDL framework they would like to see integrated into their program. Each of the design sessions was focused on one of the three



principles of UDL. During the initial design session, I provided a template for the participants to review (see Appendix F). After a brief discussion, they decided they the UDL checkpoints should be used as the dimensions. Therefore, during each of the design session, the checkpoints were listed in the far-left column, along with links to the details about each guideline found on CAST’s UDL guidelines website. Even with the checkpoints shown, most of the faculty members did not use UDL terminology in their initial comments or descriptions of desirable inclusive instructional strategies. However, the strategies still connected to the UDL framework. For instance, during an IC map design session, one faculty member shared, “There’s a lot of opportunity for...like relating to the self, like in the book club, like making sure that they have these text connections and world connections, but also self.” The actions she was describing were designed to support recruiting student interest through taking steps to “optimize relevance, value, and authenticity” (checkpoint 7.3; CAST, 2018). The strategies captured during these design sessions can be viewed in appendix G. Given the interconnected nature of the UDL guidelines, aligning checkpoints and instructional strategies was focused on usefulness to the participants not precision. After the design session, I reviewed the strategies shared across all three principles and consolidated them into a signal IC map to support ease of use when doing classroom observations and/or personal reflection. The participants were given the opportunity to review the consolidated map and make changes before it was used to complete a classroom observation. See Figure 1 to view the final IC map. This final version of the IC map was used to complete the classroom observation conducted as part of the study. It was also shared with the participants for their future use.

A crosswalk aligning the IC map with UDL checkpoints revealed that each instructional strategy on the IC map aligned to at least one UDL checkpoint; many of the strategies aligned to numerous UDL checkpoints. For example, the faculty members suggested providing content choice, which aligns to checkpoints 7.1 and 7.2 (see Table 6). Given that many of the strategies aligned to multiple UDL checkpoints, the total alignment number exceeds the total number of strategies included on the IC map. Conversely, five checkpoints did not have any strategies associated with them. Tables 4, 5, and 6 show the number of strategies included in the IC map that align to each checkpoint.

Figure 1

*IC map co-developed by lower division faculty*

		Desirable Variations for Multiple Means of Engagement, Representation and Action and Expression			Unacceptable Variations
49	Access	Provide product choice (e.g., presentation or written response) Checkpoints 4.1, 5.1 7.1, 8.1	Provide opportunities for students to work in groups with structures to support equitable engagement (e.g., assign random groups, set-up jigsaw activities, Yellowdig, Kagan structures) Checkpoints 7.3, 8.3	Provide closed captions and transcripts for videos Checkpoints 1.2, 1.3, 2.5, 7.1, 8.2,	Restrict students choices for content, product, and/or format across most assignments
		Provide content choice (pick a topic of interest [e.g., career choice]; staying within the course objectives) Checkpoints 7.1, 7.2	Provide Zoom recordings for direct instruction and/or screencasts for assignments Checkpoints 2.4, 2.5, 3.3 7.3		Use primarily lecture-based instruction and focus on independent work
		Provide tool/format choice for assignment submission (e.g., electronic [written document, recording] or paper) Checkpoints 4.1, 5.1	Provide explicit instructions on how to use technology or other tools associated with the course (e.g., navigating Canvas, accessing digital books or materials) Checkpoints 4.2, 5.1, 5.2, 7.3		
	Build	Model building an effective classroom community using a variety of strategies (e.g., stating the purpose of learning communities, fun/opening questions, guided meditation, affirmations, structures/opportunities for all voices to be heard [Yellowdig, Mentimeter]) Checkpoints 6.3, 7.3	Provide options for resources/materials (e.g., podcast, videos, readings, transcripts) Checkpoints 1.1, 1.2, 1.3, 7.1	Adjust due dates (individually or for the class) as appropriate to balance student workloads Checkpoint 6.2	Provide information in a single format (e.g., in writing)

	Set structures for supporting students in relating text/readings/activities to their career as educators to build relevance Checkpoints 3.4, 7.2, 8.1	Send materials/information/questions ahead of time for students to have time to process Checkpoints 6.2, 7.3,		
Internalize	Teach students to use a variety of reflection tools for self-monitoring (e.g., a fixed post-class or post-discussion reflection assignment, self-scored engagement rubric, exit ticket, points to ponder) Checkpoints 6.2, 6.4, 9.1, 9.3	Teach students to advocate for their needs (e.g. asking for a due date extension) including using resources available through the community, ASU, and/or MLFTC Checkpoint 9.2	Use strategies to prompt students to reflect on their previous knowledge and experiences, strategies may include collaboration and graphic organizers (e.g. KWL charts) Checkpoints 3.1, 3.2, 3.3	Present information once with the expectation students are responsible for remembering the information
	Support students in reflecting on their field experience by prompting them to label instructional strategies (e.g. Kagan structures) observed, asking questions about their observations, and/or teaching them how to provide critical critiques of their observations Checkpoints 3.2, 3.4	Prompt students to make text-to-self and/or text-to-world connections Checkpoints 3.4, 8.1	Guide students through retrieval practice activities (e.g. independent brain dump, collaborative review, guided questions [what do you own, experience but can't apply]) and guide students in identifying how they are applying their new or enhanced knowledge in other contexts Checkpoints 3.4, 5.3	
	Encourage students to critique the classroom environment (i.e., MLFTC or other university classrooms) Checkpoints 3.4, 8.1	Encourage students to critique me as their instructor Checkpoints 3.4, 8.1	Teach students to be critical observers (e.g., ask students - what do you see? what would you change?); Prompt students to utilize their "teacher lens" during observations Checkpoints 3.4, 8.1	

### ***IC map: Multiple Means of Engagement***

The principle of Multiple Means of Engagement includes ten checkpoints. Nine of the ten checkpoints were represented on the co-developed IC map by at least one associated instructional strategy, as documented in Table 4. For example, “encourage students to critique me as their instructor” aligns to checkpoint 8.1, *heighten salience of goals and objectives* (CAST, 2018) by guiding students to critically evaluate instructional strategies. The IC map did not include any instructional strategies designed to support checkpoint 8.4, *increase mastery oriented feedback*.

**Table 4**

*Multiple Means of Engagement: Checkpoint crosswalk with IC map strategies*

Continuum Category	Checkpoint Number	Checkpoint Description	Instances of Alignment to the IC map
Access	7.1	Optimize individual choice and autonomy	4
Access	7.2	Optimize relevance, value, and authenticity	2
Access	7.3	Minimize Threat and distraction	5
Build	8.1	Heighten salience of goals and objectives	6
Build	8.2	Vary demands and resources to optimize challenge	1
Build	8.3	Foster collaboration and community	1
Build	8.4	Increase mastery oriented feedback	0

Internalize	9.1	Promote expectations and beliefs that optimize motivation	1
Internalize	9.2	Facilitate personal coping skills and strategies	1
Internalize	9.3	Develop self-assessment and reflection	1

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***IC map: Multiple Means of Representation***

The principle of Multiple Means of Representation had the greatest number of checkpoints that did not have an aligned strategy on the final co-developed IC map ( $n=3$ ; see Table 5). Three checkpoints within the guideline “provide options for language and symbols” were not addressed. Checkpoints 2.2 and 2.3 mention specific contents (e.g. musical notation, mathematical notation), which the faculty may not have found directly applicable to their teaching. Checkpoint 3.4, maximize transfer and generalization, was highly represented in the faculty generated list of instructional strategies. Seven of the strategies the faculty included in the IC map aligned to checkpoint 3.4. For example, the participants included the following two strategies to enhance transfer and application of knowledge to new contexts (a) “prompt students to make text-to-self and/or text-to-world connections” and (b) “teach students to be critical observers (e.g., ask students - what do you see? What would you change?); Prompt students to utilize their ‘teacher lens’ during observations” on the final co-developed IC map.”

**Table 5***Multiple Means of Representation: Checkpoint crosswalk with IC map strategies*

Continuum Category	Checkpoint Number	Checkpoint Description	Instances of Alignment to the IC ma
Access	1.1	Offer ways of customizing the display of information	1
Access	1.2	Offer alternatives for auditory information	2
Access	1.3	Offer alternatives for visual information	2
Build	2.1	Clarify vocabulary and symbols	0
Build	2.2	Clarify syntax and structure	0
Build	2.3	Support decoding of text, mathematical notations and symbols	0
Build	2.4	Promote understanding across languages	1
Build	2.5	Illustrate through multiple media	2
Internalize	3.1	Activate or supply background knowledge	1
Internalize	3.2	Highlight patterns, critical features, big ideas, and relationships	2
Internalize	3.3	Guide information processing and visualization	2
Internalize	3.4	Maximize transfer and generalization	7

### ***IC map: Multiple Means of Action and Expression***

The principle of Multiple Means of Action and Expression included nine checkpoints. Faculty listed at least one strategy for eight of the nine checkpoints are represented on the co-developed IC map (see Table 6). For instance, “provide product choice (e.g., presentation or written response)” aligns to checkpoint 4.1, *vary methods for response and navigation*). Checkpoint 6.1., *guide appropriate goal settings*, was the only checkpoint within the principle of Multiple Means of Action and Expression without an associated instructional strategy.

**Table 6**

*Multiple Means of Action and Expression: Checkpoint crosswalk with IC map strategies*

Continuum Category	Checkpoint Number	Checkpoint Description	Instances of Alignment to the IC map
Access	4.1	Vary methods for response and navigation	2
Access	4.2	Optimize access to tools and assistive technology	1
Build	5.1	Use multiple media for communication	3
Build	5.2	Use multiple tools for construction and composition	1
Build	5.3	Build fluencies with graduated levels of support for practice and performance	1
Internalize	6.1	Guide appropriate goal setting	0
Internalize	6.2	Support planning and strategy development	3
Internalize	6.3	Facilitate managing information and resources	1



Internalize	6.4	Enhance capacity for monitoring progress	1
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The ideas shared during the IC map design sessions showed that faculty members were already using strategies in their classrooms; however, they were not using UDL terminology when describing those strategies. Given the strategies were largely based on faculty member's practices, the final IC map shows that across the lower division classes students are experiencing many inclusive practices.

### **Findings on Co-construction**

Throughout the three design sessions, a common process became evident. After I introduced a UDL principle and associated guidelines and checkpoints, one or two faculty members would describe strategies that were a part of their current instructional practices. Often, their colleagues would expand on those strategies with their own nuanced examples. Finally, the faculty members would engage in agreement seeking interactions. This process appeared to aid faculty in co-constructing knowledge around how to operationalize UDL in their classrooms. The IC map served as an effective tool to document the outcome of this process.

### **Influence of Collaboration on Disposition**

*How does collaboration between higher education faculty influence their disposition regarding the integration of UDL in higher education settings?*

A pre and post inventory was used to better understand how collaboration between higher education faculty influences their disposition regarding the integration of UDL in a higher education setting. The ISTI-R was administered to measure change in

both beliefs and actions of the lower division faculty. As participation in completing the inventory was voluntary, not all faculty who participated in the intervention ( $n=8$ ) completed the ISTI resulting in a 62.5% response rate.

The ITSI-R included five constructs, each of which was evaluated in terms of beliefs and actions. The same items were used to measure both beliefs and actions using different sentence stems (See Appendix D). Given the small sample size ( $n=5$ ), descriptive statistics (mean and standard deviation) were calculated for each construct for both the pre and post responses. Due to externally imposed limitations that were required to protect the anonymity of participants, I did not include a unique identifier for inventory respondents. As a consequence, the respondents from the pre and post inventory were unmatched. Table 7 displays these results.

**Table 7**

*Descriptive Statistics for Pre and Post- Inclusive Strategies Teaching Inventory-Revised*

Construct		Pre <i>M</i> ( <i>SD</i> )	Post <i>M</i> ( <i>SD</i> )
Accommodations	Belief	4.83 (0.38)	4.35 (1.33)
	Action	3.67 (0.57)	3.52 (0.78)
Accessibility of course materials	Belief	4.63 (0.60)	4.30 (1.34)
	Action	3.70 (0.57)	3.60 (0.68)
Inclusive lecture strategies	Belief	4.85 (0.37)	4.10 (1.29)
	Action	3.70 (0.57)	3.55 (0.51)
Inclusive classrooms			

	Belief	4.76 (0.48)	4.20 (1.46)
	Action	3.60 (0.75)	3.67 (0.74)
Inclusive assessments			
	Belief	4.45 (0.69)	3.90 (1.74)
	Action	3.50 (0.61)	3.60 (0.68)

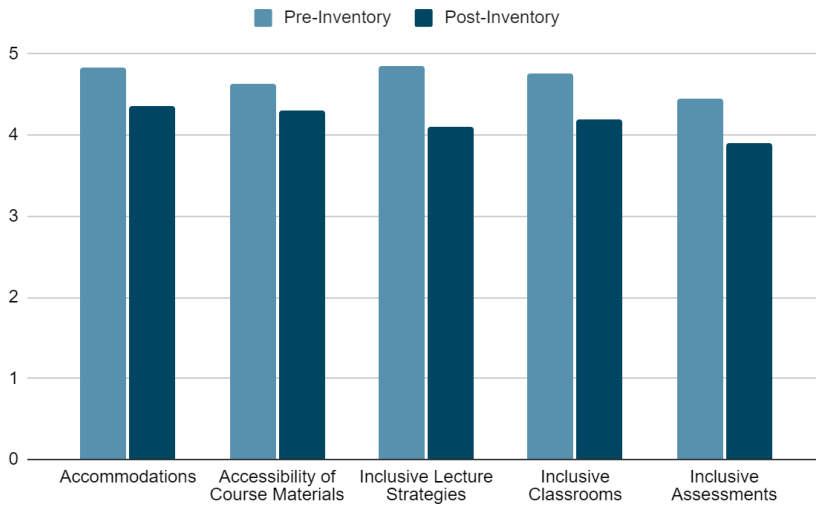
*Note.* Belief = "I believe it is important to..." Range 1-5; Action = "I do..." Range 1-4

### **Beliefs**

The mean decreased from pre to post on all five of the constructs in relation to respondents' beliefs. Figure 2 shows a visual representation of the change between the pre and post inventory on the respondents' beliefs by construct. This data is further analyzed by individual respondent; Figure 3 provides a visual showing pre-inventory responses by construct for *each respondent*, and Figure 4 provides a visual of *each respondents'* post inventory responses by construct. Figure 4 shows an outlier whose responses largely deviated from the other four respondents. As the pre and post inventory responses were not matched, it is difficult to determine if the negative results are an accurate reflection of the entire group. Responses across all five beliefs constructs are further described at the item level.

**Figure 2**

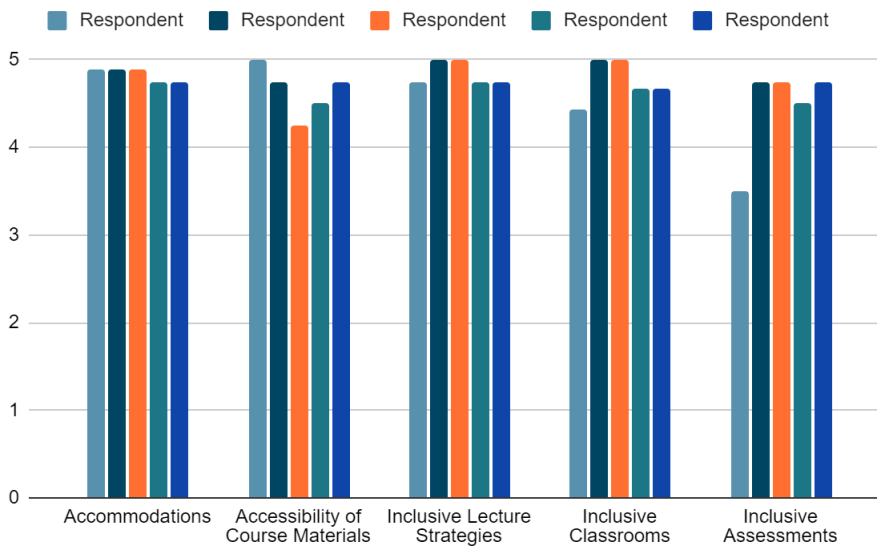
*Side-by-side Comparison of pre and post response for constructs related to beliefs*



*Note. 5=strongly agree, 4=somewhat agree, 3=neither agree or disagree, 2=somewhat disagree, 1= strongly disagree*

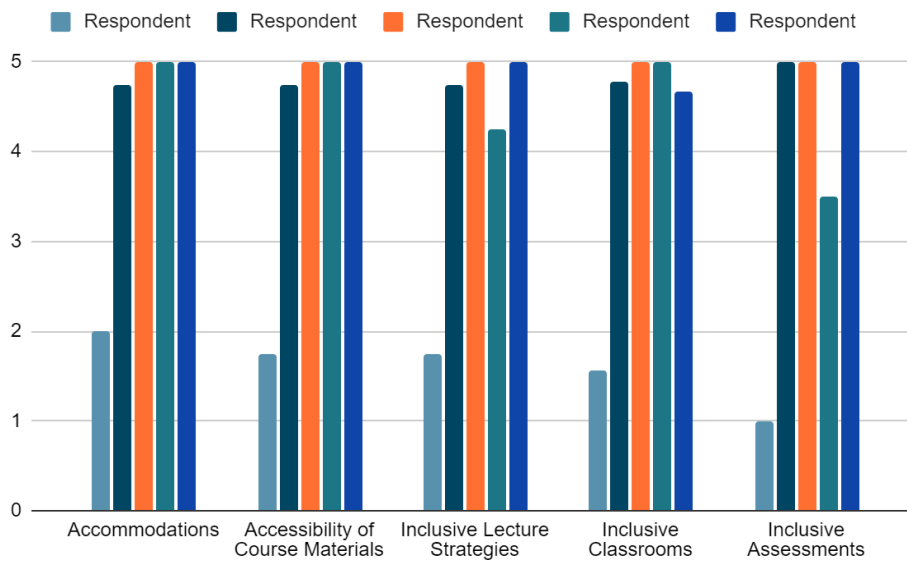
**Figure 3**

*Pre Inventory: Mean by Respondent for Belief Related Constructs*



**Figure 4**

*Post Inventory: Mean by Respondent for Belief Related Constructs*



### ***Accommodations***

The *accommodations* construct fell from a mean of 4.83 to a mean of 4.35 (see Table 7). Notably, the standard deviation (*SD*) for the pre inventory was .38 and increased to 1.38 for the post inventory. In reviewing the *SDs* at the item level data, it appears there is one post inventory respondent (an outlier), contributed to the increase in *SD* (see Figure 4). On the items related to their beliefs around accommodations, the outlier responded “strongly disagree” or “somewhat disagree” to six of the items and “somewhat” agree on two of the items. Conversely, the other four respondents rated their belief as “somewhat agree” or “strongly agree” on all eight of the items. The pre-inventory responses do not include an outlier. All of the responses to all items related to belief about the construct of accommodations ranged from “somewhat agree” to

“strongly agree.” Many of the respondents both before and after the study have strong belief that accommodations (e.g., use of technology, extend due dates, provide copies of presentations) should be provided to students.

### ***Accessibility of Course Materials***

There was a 0.33 decrease in the pre and post mean for the *accessibility of course materials* construct from 4.63 to 4.30 (see Table 7). Like with the accommodations construct, there is one outlier in the post inventory responses (see Figure 4). Of the other four respondents, three responded with “strongly agree” to all four of the items in the post-inventory. One respondent responded with “strongly agree” on three items and “somewhat agree” on one item. These data show that most of the respondents see the value in providing accessible course materials. For example, four of the respondents indicated that they believe it is important to post electronic versions of course handouts and allow students flexibility in submitting assignments. One respondent indicated that they either “strongly disagree” or “somewhat disagree” with all four items focused on faculty beliefs related to accessibility of course materials in the post inventory. This discrepancy is shown by large *SD* in the post-inventory (1.34). Both before and after the study many of respondents believed that course materials should be designed to be accessible to provide all learners with equal opportunity.

### ***Inclusive Lecture Strategies***

The mean decreased from 4.85 to 4.10 in the *inclusive lecture strategies* construct between the pre and post inventory (see Table 7). Like the previous two belief centered constructs, the post inventory has one outlier. In the pre inventory, all five of the

respondents indicated they “somewhat agree” or “strongly agree” with each of the four items within this construct. In the post inventory, four of the respondents indicated that they “somewhat agree” or “strongly agree” with each of the items. Additionally, in the post inventory one respondent indicated that they either “somewhat disagree” or “strongly disagree” with each of the four items. Most respondents indicate they believe *inclusive lecture strategies* should be used. For example, in both the pre and post test respondents indicated they believe it is important to have an outline or agenda which they share with the class.

### ***Inclusive Classrooms***

The mean decreased 0.56 from 4.76 to 4.20 in the *inclusive classrooms* construct between the pre and post inventory. Like the constructs addressed above, there was one respondent in the post inventory whose responses were discrepant from the other respondents. The *SD* on the post inventory was 1.46. All of the respondents to the pre inventory responded that they “somewhat agree” or “strongly agree” with beliefs around using *inclusive classroom strategies* (e.g., using technology, encouraging communication from students). With the outlier excluded, it is clear that the other respondents to the post inventory have a positive belief system related to using inclusive classroom strategies. On six of the nine items within this construct, four of the respondents stated they “strongly agree.” For instance, they all “strongly agree” that it is important to present course information in multiple formats. With the outlier excluded, the other three items within inclusive classrooms have means at or above 4.5 on a 5.0 scale. For example, the item “I believe it is important to supplement class sessions and reading assignments with visual

aides” had a mean of 4.5. Therefore, overall, the respondents have positive beliefs around using inclusive classroom strategies.

### ***Inclusive Assessment***

The post inventory results for the *inclusive assessment* construct were the lowest of all of the constructs with a mean of 3.90 (see Table 7). There was a decrease in the mean from 4.45 to 3.90 between the pre and post inventory. Additionally, the post inventory responses have the highest *SD* (1.74) of any of the post inventory constructs. Consistent with the previous constructs, there was one respondent who was an outlier. This respondent “strongly disagreed” with all four of the items within this construct. It is also noteworthy, that one other respondent indicated they “somewhat disagree” with the two items which include the term “ANY student.” The other four respondents indicated they “strongly agree” with the two items focused on flexibility in how students demonstrate their knowledge.

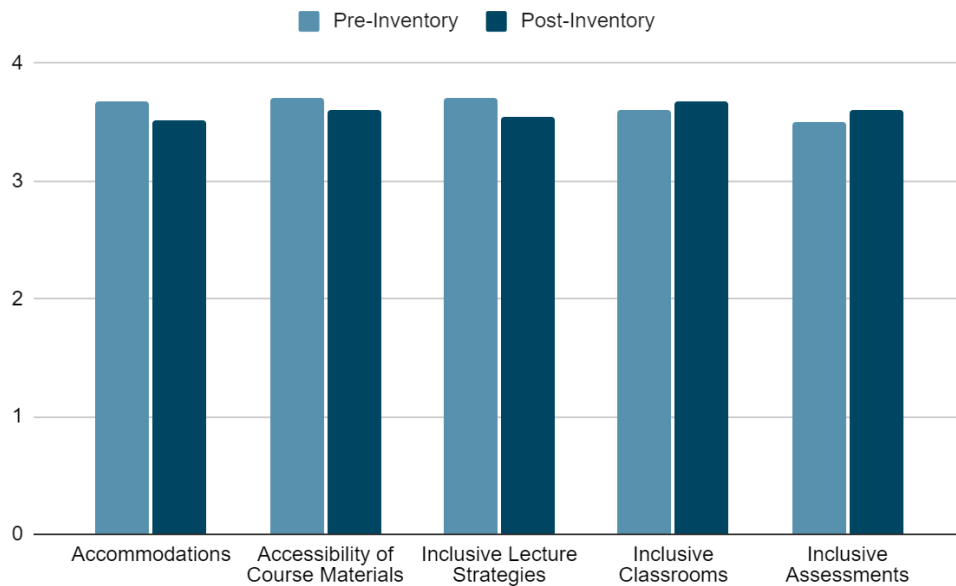
### **Actions**

The mean increased between the pre and post inventory on two (inclusive classrooms, and inclusive assessments) of the five constructs focused on faculty members’ action. A side-by-side comparison of the pre and post inventory means by construct is shown in Figure 5. Unlike the constructs related to beliefs, there is not a clear outlier in the action oriented constructs.



**Figure 5**

*Side-by-side Comparison of pre and post response for constructs related to actions*



*Note. 4=always, 3=often, 2=seldom, 1=never*

### ***Accommodations***

The mean decreased from 3.67 to 3.52 in the *accommodations* construct (see Table 7). This construct included eight items. Despite the slight decrease in mean, even in the post inventory, the most common responses were “always” and “often” indicating the respondents often use accommodations in their classrooms. For example, all respondents indicated that they “make individual accommodations for students with disabilities” and “extend the due dates of assignments to meet the needs of students with disabilities.”

### ***Accessibility of Course Materials***

The mean decreased from 3.70 to 3.60 between the pre and post inventory in the *accessibility of course materials* construct (see Table 7). Even with this decrease, it

appears that the respondents commonly use accessible course materials. For example, all respondents indicated that they “always...use a course website.” The item with the lowest mean (3.2) was “I do put my lecture notes online for ALL students.”

### ***Inclusive Lecture Strategies***

There was a decrease in the mean between the pre and post inventories on the *inclusive lecture strategies* construct from 3.70 to 3.55 (see Table 7). Like the previous two constructs, despite the slight decrease in the mean, the respondents' responses show that they are consistently using inclusive lecture strategies. For example, the respondents reported that they summarize key points in the lecture and connect key points to the larger course objectives.

### ***Inclusive Classrooms***

Unlike the previous three constructs, there was a slight increase in the mean between the pre and post inventory on the *inclusive classrooms* construct from 3.60 to 3.67 (see Table 7). Respondents shared that they create multiple opportunities for engagement ( $M=4.0$ ) and use a variety of instructional formats ( $M=3.6$ ). The item respondents were least likely to do was “survey my classroom in advance to anticipate any physical barriers” ( $M=3.0$ ).

### ***Inclusive Assessment***

There was a slight increase in the mean on the *inclusive assessment* construct between the pre and post inventory from 3.50 to 3.60 (see Table 7). Like the previous action related constructs, the data show that faculty typically use inclusive assessment

strategies. For example, respondents indicated that they “allow students to express comprehension in multiple ways.”

### **Findings on Disposition**

The limited change between the pre and post survey may be explained by (a) high pre inventory scores and/or (b) the small sample size. The mean score in the pre-inventory was high, indicating that the respondents had strong beliefs related to using inclusive instructional strategies and were likely taking action to implement many inclusive instructional strategies in their classrooms. Therefore, there was limited room for positive change. Additionally, the small sample size ( $n=5$ ) may have influenced the outcome. Specifically, the inclusion of one outlier had a consequential effect on the mean scores.

The data collected speak to the complexities of influencing disposition. Given the two components of disposition, belief and action, there are incongruent results. Across all five constructs of the ITSI-R on the post inventory, the mean was higher when asking about the respondents’ actions versus beliefs. However, the mean on the belief related constructs was influenced by one outlier (see Figure 4). Therefore, the results show some faculty members may be more inclined to take action to implement inclusive instructional practices, even though their actions may not align to their beliefs.

### **Collaboration to Support Integration of UDL**

#### ***How does higher education faculty collaboration support integration of UDL?***

As part of this study, I observed one participant teach in a face-to-face class for approximately one-hour. There were 27 students present. During the observation, I took

extensive field notes and frequently referenced the co-developed IC map. The field notes were then coded using deductive coding in which I specifically identified learner centered practices as they related to the UDL expert learner traits (see Table 8). I observed a high number of learner-centered practices during the observation and using a deductive approach allowed me to understand how those strategies relate to the UDL approach. Additionally, co-scoring the IC map with the participant provided insight into how her choices of instructional strategies applied to integrating UDL in the classroom. Table 8 shows categories of observations as they relate to the themes. For example, the instructor supported students' motivation to engage in classroom activities by helping them connect to one another through prompting students to introduce themselves to classmates they may not have sat with in previous classes and also providing ample opportunities for students to talk to a partner or have a small group discussion. These actions support UDL checkpoint 8.3, *foster collaboration and community*, which in turn motivates students to engage in classroom activities.

**Table 8***Themes, Observations, and Assertions from Classroom Observation*

Themes	Observations	Assertions
Purposeful and Motivated	Connection to instructor Connection to classmates Relevance	The instructor implemented instruction strategies designed to increase students' motivation to engage in classroom activities and learn the course content.
Resourceful and Knowledgeable	Procedural Knowledge Content Knowledge	The instructor implemented instructional strategies designed to build the students' skills as a learner, as well as their knowledge of the course content.
Strategic and Goal Oriented	Class goals Career goals	The instructor implemented instructional strategies designed to connect the classroom content and materials to both short and long term goals.

**Findings on Integration**

The data show the potential for faculty collaboration to support the integration of UDL aligned strategies. During the observation, the faculty member used a wide range of learner-centered instructional strategies, many of which align to the UDL expert learner traits as shown in Table 8. For example, several times during the observation, the instructor guided students to engage in small group or partner discussions. This strategy put learner action at the center of the instruction while also aligning to an instructional strategy articulated on the final co-developed IC map, “provide opportunities for students to work in groups with structures to support equitable engagement.” Additionally, the instructor was explicit about supporting student use of course tools which helps develop resourceful and knowledgeable learners. For instance, she showed students how to access

reference materials both in the learning management system (LMS), as well as on the internet. Further, she explained the importance of knowing how to access these materials, as the activity was “not about memorizing, about knowing you have access; acknowledging it” which supports students’ long-term goals.

In addition to the observing strategies which build UDL expert learner traits, I observed the instructor implement a large number of UDL aligned strategies which were specifically articulated in the co-developed IC map. She “model(ed) building an effective classroom community using a variety of strategies (e.g., stating the purpose of learning communities, fun/opening questions, guided meditation, affirmations, structures/opportunities for all voices to be heard [Yellowdig, Mentimeter]).” For example, she asked students a “fun” question related to the Superbowl, which had happened over the previous weekend. She then expanded by asking content specific questions.

During the co-scoring process, she indicated that she often uses strategies from the co-developed IC map which were not observed during the observation. For example, she stated when she uses videos in class, she uses captions on videos. It was clear from both my conversations with the instructor, as well as the response of the students that these are strategies that she consistently uses in the classroom.

### **Summary of Findings**

The findings from all data sources provide an insight into (1) the process of co-construction of knowledge related to operationalizing UDL in a higher education setting, (2) the influence of faculty collaboration on disposition towards using UDL aligned strategies, and (3) the integration of UDL.

The findings describe how faculty co-construct knowledge around

operationalizing UDL in higher education settings. Collaboration between faculty members resulted in a common pattern that supported its operationalization. The process included referencing the UDL guidelines, articulating an instructional strategy, expanding on that strategy, and providing agreement. The findings provided less conclusive evidence about the influence of faculty collaboration on disposition towards continued use of UDL in higher education classrooms.

It was evident from the data collected that the faculty members were using learner-centered instructional strategies, which were further reinforced through systemic faculty collaboration. As faculty members shared their own practices, they were able to expand upon each other's knowledge and experiences, as well as develop informal agreements about acceptable uses of inclusive strategies. These agreements were articulated and documented in the co-developed IC map. Though faculty collaboration had a clear effect on their current or planned use of UDL aligned inclusive strategies, the influence of collaboration on their underlying belief system is less evident. It is possible that other variables, such as college policies and peer expectations, have a larger impact on a faculty member's actions than their beliefs about inclusive practices. For example, respondents to the ITSI-R were likely to respond that they comply with strategies that target students with dis/abilities, as these align with the college and university's policies. However, respondents were less likely to agree with items on the ITSI-R that addressed "ANY student." Therefore, the findings related to faculty disposition are mixed.

Finally, it is clear from both the post inventory response, as well as the classroom observation, that faculty members are using learner-centered strategies which align with UDL. The co-development of an IC map may support the integration of UDL aligned

strategies, as it provides a structure for faculty collaboration. Overall, that data show that faculty collaboration supports the integration of UDL aligned instructional strategies in higher education.



## CHAPTER 5

### DISCUSSION

#### **Introduction**

The challenge that motivated this study is the need to support students with dis/abilities in higher education. Given that students in higher education are not required to disclose their dis/ability status (Hsiao et al., 2019; Madaus et al., 2021; Matthews, 2009; Quinlan et al., 2012), it is imperative that faculty proactively design instruction that acknowledges learner variation and supports academic success for a range of learners. UDL offers a framework to guide proactive planning to effectively meet the needs of a variety of learners and create opportunities for them to access and participate in the curriculum by reducing barriers to instruction. Therefore, it was essential to design an innovation which brought faculty members together to operationalize UDL in a higher education setting. This study was guided by three questions: (a) how do faculty co-construct knowledge around operationalizing the principles of UDL in a higher education setting, (b) how does collaboration between higher education faculty influence their disposition regarding the integration of UDL in a higher education setting, and (c) how does higher education faculty collaboration support integration of UDL in a higher education classroom? In this chapter, I provide a discussion of the findings, limitations, recommendations, and implications, as well as a personal reflection.

#### **Reflection on Findings**

The results of data collected for this study indicate that the professional development activities have positively influenced faculty members' use of UDL aligned

strategies. When opportunities for co-construction of knowledge and collaboration were provided to HEI faculty, they expanded their knowledge building on one another's ideas and contributions, as well as agreeing on acceptable inclusive instructional strategies. However, it may not have influenced their underlying belief system related to using inclusive practices, especially for students without a documented dis/ability.

### **Faculty Co-construction of Knowledge**

A pattern for how faculty co-construct knowledge was observed throughout the IC map design sessions. When presented with UDL checkpoints in the IC map design sessions, a faculty member would share how they use an aligned strategy. Often other faculty members would expand on the initial strategy shared, followed by agreement seeking interactions. Some variation of this process appeared frequently throughout the IC map design sessions. Faculty dialogue to link UDL principles and checkpoints to concrete actions and agreeing on acceptable instructional strategies is key to faculty co-construction of knowledge on how to operationalize UDL.

### **Collaborations Influence on Disposition**

The data collected through the pre and post inventories indicate that collaboration influences faculty members' actions regarding implementing inclusive instructional practice; however, it is less clear how collaboration influences faculty members' beliefs. One possible explanation is that there are additional factors which may influence actions (e.g., policies, perceived job security) but may not influence an individual's belief system. Beliefs are difficult to change in a short period of time. By engaging in small achievable tasks, it is possible to change beliefs (Anderson, 1997).

The ISTI-R includes a number of items which specifically ask about the respondents' beliefs and actions relative to "students with a documented disability" while other indicators asked about "ALL students." The responses to these items demonstrate a more nuanced view of the influence of policy. Respondents overwhelmingly indicated their support in both belief and action for items which specify they are for students with a documented dis/ability. This pattern is especially evident in the *accommodations* construct, as the whole construct is oriented towards supporting students with dis/abilities. This may indicate that respondents feel compelled to provide inclusive strategies for students with dis/abilities but do not feel the same compulsion for students without dis/abilities. Faculty members' knowledge that they must comply with state and federal laws pertaining to providing accommodations to students with dis/abilities (e.g., The Americans with Disabilities Act; Higher Education Opportunity Act) may be influencing both their attitude and actions related to using inclusive instructional strategies for students with dis/abilities.

### **Collaborations Influence on UDL Implementation**

The results of the classroom observation included in this study show that faculty collaboration had a positive influence on a participant's integration of UDL aligned instructional strategies. During the classroom observation, I observed the faculty member use a large number of learner-centered strategies, many of which were also included in the co-developed IC map. Further, during the co-scoring process, the faculty member shared that there are other strategies she routinely uses that were just not observable during the class period (e.g., adjusting assignment due dates).

## **Triangulation of the Data**

Quantitative or quantitative data alone would not have been sufficient to comprehensively explain changes in participants' co-construction of knowledge and implementation of practices in relation to UDL. Considering all the data sources for this study, I found that collaborative co-construction of knowledge had a positive influence on faculty members use of UDL. The post-inventory, classroom observation, and IC map design session transcripts all demonstrate how faculty members use inclusive instructional strategies. For example, there were multiple data points indicating the participants use instructional strategies to help their students make connections between classroom activities and larger goals. When developing the IC map, the participants included “Use strategies to prompt students to reflect on their previous knowledge and experience, strategies may include collaboration and graphic organizers (e.g., KWL charts)” as a desired strategy. This strategy was evident during the classroom observation. The faculty member reminded students of previous class discussion on four models used in Structured English Immersion (SEI). She guided them through repeating one of the activities they had previously done to learn about the SEI models and then explained how the course objectives were designed to meet the SEI endorsement requirement they need for teacher certification. Participants also indicated that they support their students in making connections in class in their responses on the ISTI-R. All of the respondents stated they always or often “connect key points with the larger course objectives during class sessions.”

## **Findings Related to Existing Research**

UDL was the conceptual framework guiding this study. The purpose of this study was not to evaluate the effectiveness of UDL as a framework for guiding instructional choices. Instead, it was focused on understanding how UDL is operationalized by higher education faculty, a topic which has been a point of discussion among researchers (e.g., Fovet, 2021; Murphy, 2021). The emphasis on faculty collaboration in this study builds upon existing research primarily in K-12 spaces (e.g., Gallucci, 2008; Thorne & Hellermen, 2015) which shows that on-going collaboration is supportive of implementing new instructional strategies. By offering opportunities to higher education faculty to enhance their knowledge of UDL through collaboration, this study shows that collaboration among higher education faculty supports the use of UDL through a process of agreement making. Peck et al. (2009) found that faculty in teacher preparation spaces share and spread new instructional strategies through collaboration at the individual level. This appears to hold true at the program level as well, as faculty teaching in the lower division (i.e., Freshman and Sophomore) program shared new or enhanced instructional strategies among the colleagues in their program during the IC map design sessions.

## **Limitations**

As with all research, this research has limitations. Limitations within this study include; (a) my role as the researcher, (b) the length of the study, and (c) the context (e.g., number of participants, teacher education faculty, contingent faculty).

## **Role as the Researcher**

My role as a faculty member in the context of this study acted as both a support, as well as a limitation. In relation to the lower division program, I consider myself a distant insider. As an insider, I have close knowledge of the cultural norms, as well as policies and processes in the college. However, I am distant from the lower division faculty, as I do not currently teach in the lower division program, which means outside of this study I do not routinely meet with the lower division faculty, teach lower division courses, or engage with students taking lower division courses. Even as a distant insider, my proximity may have had an unintended influence on the data collected. It is possible my role may have influenced the participants in the IC map design sessions, interviews, and classroom observation (Smith & Glass, 1987) to answer questions or act in the manner in which they thought I expected, due to social desirability bias (Bergen & Labonté, 2020).

## **Time Constraints**

A limitation of this study is the amount of time devoted to the professional development activities and follow-up. In an effort to be mindful of the participants' time, I made the intentional choice to keep the asynchronous professional development sessions short (~30 minutes) and limited the IC map design sessions to three sessions over one semester. Increasing the length of the intervention would have permitted me to include the two other components of CBAM (i.e., Stages of Concern and Levels of Use) in addition to the co-development of IC maps. The addition of these components may have contributed to my understanding of the context; thus, allowing me to develop a

more personalized set of professional development activities. Additional time during the intervention period would also have allowed for more in-depth discussion while co-developing the IC map. The one-hour IC map design sessions often meant discussions were cut short, not leaving time for absorption and reflective discussion.

### **Context of the Study**

Another limitation of this study is the limited context, specifically: (a) the low number of participants, (b) all participants being contingent faculty, and (c) participants coming from teacher education. Given that the study included eight participants and five responded to the pre and post inventories, the data collected represents a small number of perspectives. Further, given the anonymity of the respondents' survey results, I was not able to match pre-post responses.

Further, all of the participants are contingent faculty who teach on a year-to-year contract. Participants' comfort level with trying new strategies may have been influenced by the limited job security that accompanies a year-to-year contract (Waltman et al., 2012), as they could be concerned about the impact of new strategies on their course evaluations which are used to make rehire decisions. This lack of job security may also make them more sensitive to issues related to the expectations of their students and peers, as well as perceived freedom or constraints from their supervisors.

Further, future studies could look to emphasize the traits of students with dis/abilities which serve as strengths. For example, faculty members could consider including inclusive instructional strategies which focus on collaboration and thus draw on all students' strength. This approach will also support changing normative views around dis/ability.

Finally, all of the participants have experience and expertise in teaching; therefore, they likely have more pedagogical training than faculty members in disciplines outside of teacher preparation. Their increased pedagogical training means they had background knowledge of UDL or other inclusive instructional strategies. Faculty members with limited pedagogical or andragogical training may respond differently to the professional development activities included in this study.

### **Implications for Future Research**

Based on the outcomes of this study, I propose two key areas to extend this research; (a) expanding the context and (b) understanding the role of policies.

#### **Expanding the Context**

As was noted as a limitation, this study only included contingent faculty with year-to-year contracts. Existing research on job security in higher education (e.g., Kezar & Bernstein-Sierra, 2016; Waltman et al., 2012) shows that perceptions of job security influence faculty members' choices. Therefore, in future studies, I propose including faculty members on multiple-year contracts or who have earned tenure, as they would add additional perspectives.

Since this study was conducted with teacher educators, they likely have more pedagogical training than higher education faculty members without a teaching background (Postareff, et al., 2008). Therefore, conducting this study with higher education faculty from disciplines outside of teacher education may lead to more nuanced insight into how faculty member collaboration influences disposition. Given that faculty members outside of teacher education may have had fewer opportunities to discuss their



beliefs related to education and specifically inclusive education, engagement in a study of this nature may have a more meaningful influence on their belief systems.

In future studies, researchers could extend the duration of the data collection to further explore the long-term use of the co-developed IC map to guide UDL implementation. Additionally, future research could include professional development to support faculty members in observing one another and co-scoring the IC map to measure the quality of the integration of UDL aligned strategies.

Further, future studies could look to emphasize the traits of students with dis/abilities which serve as a strength. Faculty members could consider including inclusive instructional strategies that focus on collaboration in teams and thus draw on all students' strengths. For example, students with autism often pay strong attention to detail (Liao et al., 2022) that may contribute to a team's success. This approach will also support changing normative views around dis/ability.

### **University Policies**

Given that most of the participants responded positively to items on the ISTI-R which correspond to university policies and practices (e.g., providing accommodations to students with a documented dis/ability), further research is needed to understand how and under what circumstances policies influence faculty members' instructional choices.

Research on faculty members' awareness and understanding of university policies related to using inclusive instructional practices may help inform both professional development and policy development. Additional research investigating the tension between faculty members' tendency to adhere to federal, state, and university policies while also desiring permission from leadership to be flexible in how they adapt to learner's needs is also needed.

### **Implications for Practice**

Through the implementation of this study, I learned that faculty collaboration plays an important role in the integration of new instructional practices in a faculty member's repertoire. The data collected during the IC map design sessions demonstrated that faculty seek agreement on acceptable strategies for higher education classrooms. Therefore, I suggest embedding opportunities for faculty collaboration and agreement building across the systems and processes used in higher education institutions, including (a) professional development on the federal policy requiring the use of UDL, (b) consistent opportunities for faculty dialogue, and (c) strategies for using UDL to guide curriculum development.

In the context of this setting and other teacher preparation programs, professional development explaining the requirement of the Higher Education Opportunity Act (HEOA) to use UDL in their practices and teach preservice teachers how to use UDL is essential. Beyond understanding the requirements from HEOA, faculty members also need training on the policies and processes implemented by the university or college. For example, it is important for faculty to understand the role that disability service units play in coordinating and implementing accommodations, as well as what other university units

(e.g., teaching and learning centers) can offer to support the implementation of inclusive practices without regard to a student's dis/ability status.

Faculty members need consistent opportunities to engage in dialogue about implementing inclusive instructional practices in order to come to an agreement on acceptable instructional strategies. I recommend using a structure, like developing an IC map, to document these discussions and agreements for long-term use. Further, these opportunities need to be ongoing so that faculty members can discuss new challenges and evaluate the effectiveness of the strategies they are using. Structures for ongoing dialogue could include the establishment of Communities of Practice (CoP) or standing faculty meetings focused on the integration of inclusive instructional strategies.

Further, university faculty engage in many processes in order to develop a curriculum prior to the implementation of that content by faculty members. Therefore, given the intended proactive nature of UDL, it is vital that a UDL approach be used throughout the development processes. For example, faculty should consider how facets of the syllabus support the use of UDL aligned instructional strategies (e.g., offering materials in a variety of modalities [readings, podcasts, videos], embedding choice in assignments). In this way, faculty members implementing the curriculum will be set-up to successfully implement UDL aligned instructional strategies. This may reduce the need for faculty members to seek agreement from their peers or permission from leaders to use inclusive strategies.

### **Personal Reflection**

Reflection is a key component of AR (Mertler, 2020); therefore, it is important that I take time to reflect on my process as a novice researcher going through this

journey. I will share the lessons I have learned both about the process of action research, as well as the outcomes of the research.

One key lesson I learned through this process was the value of the iterative and non-linear process inherent in AR. For instance, I initially conceptualized completing this study with teacher preparation faculty engaged with a United States Agency on International Development (USAID) funded teacher preparation project. It became clear during the initial cycle of research (i.e., cycle zero) that I was not prepared to address the unique barriers (e.g., institutional permissions, language barriers) present in conducting international research. However, I was surprised by how what I learned during the initial cycle of research informed my overall thinking and approach, even though the context changed. In that regard, I learned that each step or misstep is part of the learning process.

I encountered unanticipated challenges in analyzing the data I had collected. For example, I had failed to consider the impact of a small sample size on the use of a pre/post inventory. Additionally, I found it challenging to complete a thematic analysis of the qualitative data used, as initially, I did not keep my RQs at the forefront of my analysis approach. Therefore, I included a wide number of codes that were of interest, but did not help me answer the RQs. For example, during my first round of coding, I coded instructional strategies using the UDL checkpoints, which was too fine grained and did not contribute to my understanding of the impact of the faculty collaboration. In the future, I will be more intentional about using RQs to guide decisions about data collection, as well as analysis.

As a result of completing this study, I learned the importance of faculty members feeling empowered to make changes to their instructional practices through both social

agreement from their peers and permission from those in leadership positions. This is valuable information as I continue to work with higher education faculty members in various facets of my career. Conducting this study was a valuable learning experience and has both deepened my knowledge, as well as sparked new interests.

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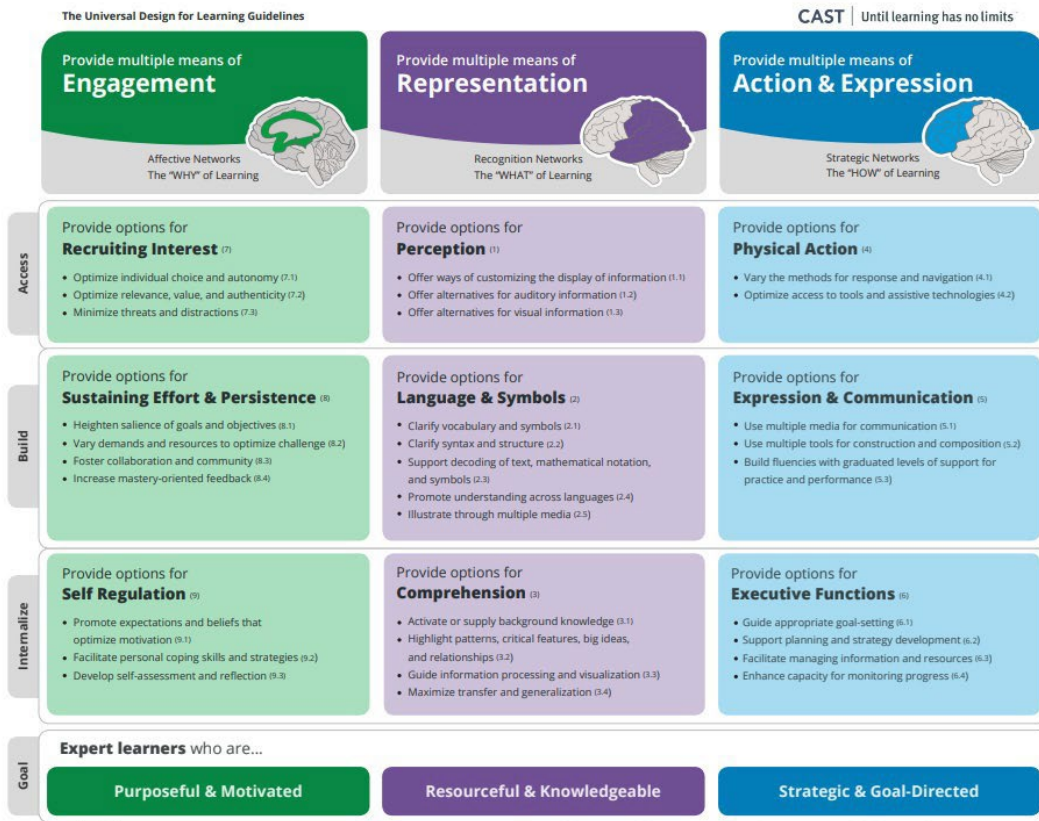
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APPENDIX A  
IMPLEMENTATION TIMELINE

Timeframe	Activity
September 2022	Faculty take ITSI-R pre-inventory
Fall 2022	Faculty engage in asynchronous online modules
Fall 2022	Faculty co-develop an IC Map for implementing UDL in lower division courses
December 2022	Faculty take ITSI-R post-survey
December 2022	Faculty interviews
Spring 2023	Collaborative class observations using the IC Map (observations of synchronous and asynchronous activities)
Summer 2023	Data Analysis

APPENDIX B  
UDL GUIDELINES





udlguidelines.cast.org | © CAST, Inc. 2018 | Suggested Citation: CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Wakefield, MA: Author.

(CAST, 2018)

## APPENDIX C

### ASYNCHRONOUS MODULES OUTLINE

## Asynchronous Module 1

**Title:** Introduction to Universal Design for Learning and Implementing Multiple Means of Engagement in a Higher Education Classroom

### Objectives:

- Describe the concept of learner variability and its role instructional planning
- Identify the emphasis in UDL on developing expert learners
- Connect UDL guidelines 7, 8, and 9 with the principle of multiple means of engagement
- Generate suggestions for implementing the guidelines within multiple means of engagement in a higher education classroom

**Modality:** Participants may access the module content as a video recorded presentation, audio recorded presentation or written transcription.

### References:

- Beauchemin, A. (2022). *Curriculum development at a UDL university: what works, what doesn't*. In R. Laist, D.C. Sheehan & N. Brewer (Eds.), *UDL University: Designing for variability across the postsecondary curriculum*. CAST.
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### Supplemental Resources:

- Griful-Freixenet, J., Struyven K., & Vantieghem W. (2021). Toward more inclusive education: An empirical test of Universal Design for Learning conceptual model among preservice teachers. *Journal of Teacher Education*, 72(3).  
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- Stachowiak, B. (Host). (2015, July 23). Episode 058: Universal Design for Learning [Audio Podcast episode]. In *Teaching in Higher Ed*.  
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## **Asynchronous Module 2**

**Title:** Implementing Multiple Means of Representation in a Higher Education Classroom

### **Objectives:**

- Connect UDL guidelines 1, 2, and 3 with the principle of multiple means of representation
- Generate suggestions for implementing the guidelines within multiple means of representation in a higher education classroom

**Modality:** Participants may access the module content as a video recorded presentation, audio recorded presentation or written transcription.

### **References:**

Alsalamah, A. (2020). Assessing students in higher education in light of UDL principles. *American Research Journal of Humanities & Social Sciences*, 3(1). p. 24-27.

CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer].

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Hess, A. N., Moore, C., & Ableser, J. (n.d.). *Representation: Universal Design for Learning principle* [Infographic]. The Center for Excellence in Teaching and Learning. [https://www.oakland.edu/Assets/Oakland/cetl/files-and-documents/QuickNotes/UDL\\_RepresentationQNFeb9.pdf](https://www.oakland.edu/Assets/Oakland/cetl/files-and-documents/QuickNotes/UDL_RepresentationQNFeb9.pdf)

Smith, Z. V. (2022). *From standard operation procedures to Universal Design for Learning: A lifelong learning process*. In R. Laist, D.C. Sheehan & N. Brewer (Eds.), *UDL University: Designing for variability across the postsecondary curriculum*. CAST.

### **Supplemental Materials:**

Arizona State University. (n.d.). What is accessibility? ASU Accessibility. <https://accessibility.asu.edu/asu-accessibility/what-accessibility>

Lasseter's Lab. (2021, January 29). How-to-do a Pecha Kucha presentation for class [Video]. YouTube. [https://www.youtube.com/watch?v=hC86\\_sVwkhE](https://www.youtube.com/watch?v=hC86_sVwkhE)

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## **Asynchronous Module 3**

**Title:** Implementing Multiple Means of Action & Expression in a Higher Education Classroom

### **Objectives:**

- Connect UDL guidelines 4, 5, and 6 with the principle of multiple means of action and expression

- Generate suggestions for implementing the guidelines within multiple means of action and expression in a higher education classroom

**Modality:** Participants may access the module content as a video recorded presentation, audio recorded presentation or written transcription.

**References:**

- Brewer, N. (2022). *Practicing social justice and becoming agents of change*. In Laist, R., Sheehan, D. C. & Brewer, N. (Eds.), *UDL University: Designing for variability across the postsecondary curriculum*. CAST.
- CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Author. <http://udlguidelines.cast.org/more/downloads>
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- Fox, P. (2022). *Badges and paths: Creating learner centered environments in online classes*. In R. Laist, D.C. Sheehan & N. Brewer (Eds.), *UDL University: Designing for variability across the postsecondary curriculum*. CAST.
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**Supplemental Materials:**

- Center for Innovation, Design, and Digital Learning [CIDDL]. (2022). Video-based reflections in teacher preparation. CIDDL. <https://ciddl.org/research-and-practice-brief15-video-based-reflections-in-teacher-preparation/>
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- Student Accessibility and Inclusive Learning Services. (n.d.). Alternative Format. Arizona State University: Educational Outreach and Student Services. <https://eoss.asu.edu/accessibility/faculty-staff/alternative-format>
- UDL on Campus. (n.d.). Creating accessible open educational resources. UDL on Campus. [http://udloncampus.cast.org/page/media\\_oer\\_creating](http://udloncampus.cast.org/page/media_oer_creating)

APPENDIX D

INCLUSIVE TEACHING STRATEGIES INVENTORY - REVISED (ITSI-R)



Subscale	Item
	<p>begin each class session with an outline/agenda of the topics that will be covered</p> <p>summarize key points throughout each class session</p> <p>connect key points with larger course objectives during class sessions</p>
Inclusive Classroom	<p>use technology so that my course material can be available in a variety of formats (e.g., podcast of lecture available for download, course readings available as mp3 files)</p> <p>use interactive technology to facilitate class communication and participation (e.g., Discussion Board)</p> <p>present course information in multiple formats (e.g., lecture, text, graphics, audio, video, hands-on exercises)</p> <p>create multiple opportunities for engagement</p> <p>survey my classroom in advance to anticipate any physical barriers</p> <p>include a statement in my syllabus inviting students with disabilities to discuss their needs with me</p> <p>make a verbal statement in class inviting students with disabilities to discuss their needs with me</p> <p>use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands on activities</p> <p>supplement class sessions and reading assignments with visual aids (e.g., photographs, videos, diagrams, interactive simulations)</p>
Inclusive Assessment	<p>allow students to demonstrate the knowledge and skills in ways other than traditional tests and exams (e.g., written essays, portfolios, journals)</p> <p>allow students to express comprehension in multiple ways</p> <p>be flexible with assignment deadlines in my course(s) for ANY student who expresses a need</p>



Subscale	Item
	allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need

Adapted from Lombardi, et al., 2015

APPENDIX E  
INTERVIEW GUIDE

## **Introduction**

Thank you for participating in the UDL professional development session this past semester and agreeing to today's interview. The purpose of today's interview is to get a better understanding of your thoughts on using UDL in the lower division program, specifically your thoughts on the effectiveness of co-developing the IC Map. Your experience and insights are important to this process; so please feel free to speak openly.

I anticipate that this interview will last between 45 minutes and one hour. I will keep your answers confidential and will de-identify any responses when shared with my dissertation committee or used in my dissertation.

Do I have your permission to record our conversation? Please let me know if you would like the recording stopped at any time.

---

*The following questions and prompts will be used in this semi-structured interview, as appropriate based on the answers and other information shared by the participant. Additional queries, such as "tell me more" or "can you elaborate on that" will be used as needed throughout the interview.*

## **Questions and Prompts**

1. Reflecting on the discussions you had with your colleagues about UDL over the last semester, did your perception of UDL as a framework or your thoughts about implementation change?
  - a. How so?
  - b. Was there anything specific you discussed with your colleagues that inspired/facilitated that change?
  - c. Were you surprised by anything that came up during the IC map development or related discussions?
1. In retrospect, what was your level of comfort using UDL-aligned strategies before co-developing this IC map?
  - a. Thinking back, were either intentionally or unintentionally integrating UDL strategies in your instructional practices?
  - b. How do you think your knowledge of UDL has changed? Or not changed?
    1. Do you think this process influenced faculty members' use of UDL?
  - a. Why? Or Why not?
    1. What did you see as some potential pros and cons of using an IC Map to guide UDL implementation?
    2. Did you plan to continue using a UDL approach when planning your instruction?
      - a. Do you anticipate that your colleagues will (also) be using a UDL approach?
        1. Is there anything you would like to know that I did not ask you about today?

APPENDIX F  
SAMPLE IC MAP TEMPLATE

Component Name:				
COMPONENT: A component is often the answer to a “what” question—what does the innovation consist of? What are its “moving parts”? What are the main “buckets” the elements of the innovation fall into?				
Dimension 1  (Dimensions are the qualities of the components; e.g., online, face-to-face, assessment, assignments)	a. Ideal  (If this dimension was executed perfectly, what would it look like?)	b)	c)	d) less than ideal  (If the dimension were implemented poorly, what would it look like? )
Dimension 2				
Dimension 3				

(adapted from REL Appalachia: Regional Education Laboratory, n.d.)

APPENDIX G

IC MAP DESIGN SESSION NOTE

Guideline	Checkpoint	Examples:		
Provide Options for Recruiting Interest		Provide product choice (e.g. presentation or written response)	Provide tool/format choice for assignment submission (e.g. electronic {written document, recording] or paper)	Provide content choice (pick something on interest [e.g. career choice]; staying within the course objectives)
	Optimize individual choice and autonomy	Provide students with the option to stand or move during class as needed; 17-minute rule (have students move every 17-minutes or more often if needed)		
	<a href="#">Optimize relevance, value, and authenticity</a>	Complete a class activity (e.g. just for fun) then ask what grade-level it is appropriate for		
	<a href="#">Minimize threats and distractions</a>	Put students in groups (a, b, c; "silly" categories [popcorn, chips, redbull water]) with assigned roles/tasks	Complete a snowball activity (write three things on a paper, snowball fight, read comments)	Group readings with partner teach; mini teach; jigsaw
		Provide students with Mini-examples of projects		
Provide Options for Sustaining	<a href="#">Heighten salience of goals and objectives</a>	Text-to-Self Connection; Set structure for supporting students in relating text/readings to their career as educators	Provide direct connections between the course/lesson content and students' career goals	

Effort & Persistence	<a href="#">Vary demands and resources to optimize challenge</a>	Adjust due dates (individually or for the class) in advance based on feedback from students around other obligations (i.e. assignments in other classes) or their feeling of readiness to complete the assignment	Provide choice for resources that have similar topics (e.g.,	
	<a href="#">Foster collaboration and community</a>	Include structures that support students engagement across groups	Complete bucket fillers activities	Start class with mindfulness activity/guided mediation, affirmations (5-10 minutes)
		Model community by stating the purpose of being in a professional learning community	Start class with a just for fun activity (e.g., would you rather, just a question)	Text-to-Self Connection; Support students in relating text to themselves, connecting experience with the readings (across courses)
		Encourage students to move to new spaces/groups	Establish structures in which every students has an opportunity for their voice to be heard (e.g. Menitmeter, Yellowdig)	
	<a href="#">Increase mastery-oriented feedback</a>	Provide clear rubrics for assignments	Give students specific feedback on how to improve their submissions	



Provide Options for Self-Regulation	<a href="#">Promote expectations and beliefs that optimize motivation</a>	Develop a personal teaching philosophy and revisit and refine it over time		
	<a href="#">Facilitate personal coping skills and strategies</a>	Check-in/welcome students before class, walk around the classroom (questions like- how are you doing? who has a birthday coming up?)	Share examples from the instructor life (e.g. what the instructor did over the weekend, use pictures)	Encourage students to work together on difficult content
		Ask about students' workload, change due dates if appropriate (if agreed upon prior to the due date); reiterate that things can be submitted late	Encourage students to talk to their professors (themselves or others); teaching self-advocacy (e.g., how to ask for a due date extension)	Teach students about resources available at MLFTC, ASU, and in the community
	<a href="#">Develop self-assessment and reflection</a>	Direct students to complete a reflection after class (take what is learned to how they will apply that learning later)	Develop teaching philosophy and then revisit it in later courses	Teach students to write a SMART goal (academic & personal); TEL 111 and then TEL 270
		Complete a fixed feedback reflection after each small group discussion, a checklist (e.g., what did I do well today)	Guides students to self-score a professional engagement rubric	Have students complete exit tickets or points to ponder (follow-up with clarifications during the next class session)

Guideline	Checkpoints	Examples:			
<b><u>Provide Options for Perception</u></b>	<u>Offer ways of customizing the display of information</u>	<u>Interactive calendar, working document for students, shown at the start of class daily with links to other documents, embedded in Canvas (view only)</u> <b>**example linked</b>			
	<u>Offer alternatives for auditory information</u>	Provide closed captions on all videos	Zoom recordings of courses, could be used for direct instruction; screencasts for assignments		
	<u>Offer alternatives for visual information</u>	Use closed caption; provide transcripts for videos	Ask students to send audio recordings for assignments		
	<u>Clarify vocabulary and symbols</u>				
	<u>Clarify syntax and</u>				

<b><u>Provide Options for Language &amp; Symbols</u></b>	<b><u>structure</u></b>				
	<b><u>Support decoding of text, mathematical</u></b>	Use example from the standards (e.g. fractions are written with a slash, good			
	<b><u>notation, and symbols</u></b>	example for accessibility)			
	<b><u>Promote understanding across languages</u></b>	Using text information that can be translated (e.g. closed caption); AI translation applications	Provide one-on-one support for classroom structure (e.g. review Canvas layout)	Send materials/information ahead of time for students to have time to process	Send questions to students ahead of class to allow them time to formulate a response
	<b><u>Illustrate through multiple media</u></b>	Utilize podcasts and videos to disseminate information			
	<b><u>Activate or supply background knowledge</u></b>	Prompt students to "think back to when you were in school" (e.g. ask about feelings, how would you do things different)	Start each class with something related to the day's topic (bell work; e.g. quote, image, short video)	Have students sit in collaborative groups or move to have conversations to share their background knowledge/their experiences (Kagan structures)	Practice retrieval process (e.g., ask - what do you own, experience but can't apply) to guide reflection; guide to recognize how they are applying it in other contexts

<b><u>Provide Options for Comprehension</u></b>		Support students in labeling instructional strategies they are witnessing in their internships (e.g. Kagan structures)	Prompt students to make text-to-self and/or text-to-world connections	Use graphic organizers (e.g. KWL charts) to prompt students to reflect on their previous knowledge and experiences	
	<b><u>Highlight patterns, critical</u></b>	Use graphics and/or diagrams to highlight critical features			
	<b><u>features, big ideas, and relationships</u></b>				
	<b><u>Guide information processing and visualization</u></b>	Guide retrieval practices (e.g. independent brain dump, collaborative review)	Guide students through a mapping activity		

	<a href="#">Maximize transfer and generalization</a>	Ask students to share out what they are seeing in the observations and relating it to the course content	Teach students how to be critical observers (e.g. prompt students with what do you see,? what would you change?); Prompt students to utilize their "teacher lens"	Prompt students to ask questions about what they are seeing in their placements	
		Encourage students to critique the classroom environment (MLFTC classroom)	Encourage students critique me as the instructor		

Guideline	Checkpoints	Examples:			
<a href="#">Provide Options for Physical Action</a>	<a href="#">Vary methods for response and navigation</a>				
	<a href="#">Optimize access to tools and assistive technologies</a>	Explicitly show students how to navigate the LMS			
	<a href="#">Use multiple media for</a>	Provide access to course materials in multiple places (e.g. Canvas shell, announcements, posted calendar, slide	Provide screencast directions/explanations for longer assignments	Encourage students to create/use a mechanism for reaching out to classmates (e.g. share phone numbers, create a social media page,	

<b><u>Provide Options for Action and Expression</u></b>	<a href="#">communication</a>	decks)	posted in LMS	GroupMe)	
		Send a weekly announcement highlighting upcoming activities, assignments, etc. (include links to relevant documents)			
	<a href="#">Use multiple tools for construction and composition</a>	Make a jamboard/google doc for students to share their progress on course tasks (e.g. how many intern hours they have completed) and work with their peers to			

		develop a plan for moving forward			
	<a href="#">Build fluencies with graduated levels of support for practice and performance</a>	Structure group practice for new skills (e.g. analysis of an article); critique each other in a small group; start with grading a small group then a full group	Use peers as example, since they are not yet an expert	Model giving feedback for future teachers using think alouds (e.g. pause and listen, give verbal feedback make connection, ask questions)	Have students facilitate a discussion where they practice ensuring all students are equitably engaged, acknowledge student comments, provide feedback, refocus the discussion, and address student comments
		Narrative back good practice to students about teaching strategies (e.g. questioning)	Set expectations for presenters and audience; review the rubric	Make explicit connections between course content and activities and the skills students will need in their professional endeavors	
		Teach students how to reflect on both positive and negative experiences in their	Teach students to use their teacher lens in order to help students focus their observation/attention to learn the concepts/elements for	Encourage students to share effective work	

<p><b><u>Provide Options for</u></b></p>	<p><b><u>Guide appropriate goal-setting</u></b></p>	<p>internships and describe how they can use lessons learned in their future teaching</p>	<p>their career, learn to look past things that do not align with their skills, interest approaches (ex. ukele)</p>	<p>strategies/habits they use (teaching philosophy ; goal setting)</p>	
	<p><b><u>Executive Function</u></b></p>	<p><b><u>Support planning and</u></b></p>	<p>Provide consistent support and scaffolding</p>	<p>Guide students in reflecting on their progress and their</p>	<p>Assign self-reflection activities to students on</p>

	<p><b><u>strategy development</u></b></p>	<p>to help students manage their time</p>	<p>plan; encourage support between peers</p>	<p>their preparedness and engagement in class and prompt them to determine what changes they may need to make to improve their performance in the future</p>	
		<p>A mid-semester gradebook check and let students who have</p>	<p>Guide students to use a variety of self-</p>		



	completed all items to miss a class.	reflection practices (e.g. Start, Stop, Keep)		
<a href="#">Facilitate managing information and resources</a>				
<a href="#">Enhance capacity for monitoring progress</a>	Guide discussions on professionalism (e.g. integrity, "do what you say you'll do," meeting deadlines) to center students self-reflection on their professional goals by focusing on skill acquisition over completing tasks for a grade	Provide explicit examples to show students how their actions in the classroom speak to their overall professionalism (e.g. how their actions affect their classmates)	Provide students with self-reflection questions (e.g. What steps do I need to adjust to be prepared for the activities in class? How will this skill help me as a teacher?, What am I doing now that is working?)	

**APPENDIX H**

**INTERNAL REVIEW BOARD**



EXEMPTION GRANTED

Sarup Mathur  
 MLFTC: Educational Leadership and Innovation, Division of  
 480/965-6893  
 SARUP.MATHUR@asu.edu

Dear [Sarup Mathur](#):

On 8/26/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Faculty collaboration to support implementation of Universal Design for Learning (UDL)
Investigator:	<a href="#">Sarup Mathur</a>
IRB ID:	STUDY00016393
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> <li>• August 25, 2022 Responses to Feedback, Category: Other;</li> <li>• Feedback Responses, Category: Other;</li> <li>• Mathur_IRB (Pinkerton)8-25-2022.docx, Category: IRB Protocol;</li> <li>• Mathur_pre_post inventory.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);</li> <li>• MLFTC Vice-Dean Approval, Category: Other;</li> <li>• Module 1 Slide deck, Category: Other;</li> <li>• Module 2 Slide Deck, Category: Other;</li> <li>• Module 3 Slide Deck, Category: Other;</li> <li>• Recruitment_Methods_Email_08_25_2022.pdf, Category: Consent Form;</li> <li>• supporting documents_08_09_0222 (1).pdf, Category: Other;</li> </ul>

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 8/25/2022.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at [research.integrity@asu.edu](mailto:research.integrity@asu.edu) to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

**REMINDER** - - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found [here](#). IRB approval is related to the research activity involving human subjects, all other protocols related to COVID-19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB Administrator