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Bridging the Knowledge-to-Action Gap: A Qualitative Description of the Use of Knowledge Translation in Entry-Level Doctor of Occupational Therapy Capstones

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Abstract of Dissertation

Bridging the Knowledge-to-Action Gap:
A Qualitative Description of the Use of Knowledge Translation
in Entry-Level Doctor of Occupational Therapy Capstones

Although developments in the use of knowledge translation (KT) in occupational therapy practice and research are emerging, a gap in education remains. A recent revision of accrediting standards for doctor of occupational therapy (OTD) programs now specifies scholarly study that advances KT. However, little is understood of how this change in accreditation standards is being implemented, nor of its effect on OTD capstones. The purpose of this study was to describe how KT is reflected and can be promoted in entry-level OTD capstones. A descriptive qualitative design was used with semi-structured individual interviews of OTD faculty as well as content analysis of completed capstone documents. Both inductive and deductive coding were used; the codebook served as an analytic tool based on the knowledge-to-action framework.

Although analysis indicated various levels of understanding regarding KT among OTD faculty, all faculty recognized advantages to using a KT framework with capstones. Content analysis of capstone documents revealed patterns in the way KT concepts were reflected in the capstones. This study identified three themes that suggest promoting KT in capstones entails operationalizing: 1) how capstones currently reflect KT concepts, 2) how capstone process is influenced by faculty perspectives: values and constraints, and 3) what advantages and challenges exist to incorporating KT into capstones. Findings suggest opportunities to promote KT in OTD curricula to support students as practitioner-scholars in closing the research-practice gap.

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CHAPTER 1:

INTRODUCTION

Background and Overview

As demand for quality patient care grows, so does the need for translating knowledge from research to practice, which, according to Balas and Boren (2000), can take an average of 17 years. Knowledge translation (KT) proposes to minimize or close the research-to-practice gap to maximize research benefits within a particular practice setting (Graham et al., 2006; Scott et al., 2012; Straus et al., 2013). KT has been identified as an interactive process supported by successful exchanges between researchers and practitioners (Sudsawad, 2007). Bridging the research-to-practice gap requires using KT as an integral framework and resource in occupational therapy (OT) to promote the transfer of knowledge to practice.

New knowledge and innovations within the OT field continue to advance rapidly. A number of scholars have noted that occupational therapists are committed to engagement in scholarship (Bilics et al., 2016; Govender & Mostert, 2019). The profession recognizes the range of scholarly endeavors required to advance the profession, including the "engagement of learners in their development and understanding of the profession" (Bilics et al., 2016, p. 1). Boyer's model of scholarship defines scholarship in five areas: scholarship of discovery, integration, application, teaching, and learning (Boyer, 1992). Bilics et al. (2016) described the scholarship of application as a means for practitioners "to apply the knowledge generated by scholarships of discovery or integration" (p. 2). The scholarship of application has also been called scholarship of practice and KT (Bilics et al., 2016; Govender & Mostert,

2019). This is just one scholarly activity that can help prepare students to be competent professionals and advance the profession. Entry-level doctorate of occupational therapy (OTD) programs are in a unique position to advance the capacity of KT through student work.

The first entry-level OTD program was accredited in 1998, and now there are well over 100 programs that are either accredited or in the process of accreditation (AOTA, 2014). As OTD programs are established and more are transitioning from a master's to a doctoral degree, accreditation standards have changed (Stephenson et al., 2020). The most recent accreditation standard change was in 2018. One major element of the doctoral degree program is the capstone requirement (DeIuliis & Bednarski, 2020; Stephenson et al., 2020).

Jirikowic et al. (2015) described the capstone as an "integrative learning process" (p. 216), involving the integration of didactics, an extensive literature review, and data to formulate a capstone project. The Accreditation Council for Occupational Therapy Education (ACOTE) requires a capstone project and experience for the OTD student. Standard D.1.0 states that the goal of the capstone experience "is to provide an in-depth exposure to one or more of the following: clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, and theory development" (ACOTE, 2018, p. 43).

The experiential learning component of the capstone requires 14 weeks of student involvement at a particular site related to OT. This experience provides in-depth exposure to one of the focus areas listed above. Before beginning the capstone experience, the student writes a capstone project plan, which may include a scholarly question, needs

assessment, literature review, and project methodology (DeIuliis & Bednarski, 2020). During the capstone experience, the student also collects, manages, and analyzes data as proposed in the project plan (DeIuliis & Bednarski, 2020).

Statement of Problem

Occupational therapists are educated in providing effective interventions, including providing best care and using relevant resources of evidence to shape decision-making. New knowledge and innovations within the field of OT continue to advance at a rapid pace. Despite several calls to action for occupational therapists to utilize KT in practice, there continues to be a lag between knowledge discoveries and translation to practice (Cramm et al., 2013; Juckett et al., 2019; Sudsawad, 2007). Although not specific to OT, it has been cited in OT literature that research continues to take up to 17 years to translate into practice (Balas & Boren, 2000). In healthcare, including OT, this has been described as the research-to-practice gap (Bauer et al., 2015; Juckett et al., 2019; Metzler & Metz, 2010).

Occupational therapists enter the profession with a clinical doctorate (OTD), which requires capstone projects. With the potential of OTD capstones to bridge the knowledge-to-practice gap, new standards for entry-level education require a focus on KT. The Canadian Institutes of Health Research (2016) coined the term *knowledge translation* and defined it as "the exchange, synthesis and ethically-sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of research" (para. 4). However, there is little information regarding the intent and scope of these scholarly capstone projects, including how these projects have addressed KT. OTD graduates must be prepared in clinical doctoral

programs to address this need, yet critical appraisal and KT competencies for OTD students have not been well defined in OTD curricula. As practitioner-researchers, OTD students have the potential to be context experts who can help close the research-to-practice gap and improve health outcomes in the United States.

Purpose

The purpose of this study was to describe how KT is reflected in entry-level OTD capstones and how KT can be promoted in entry-level OTD capstones.

Research Paradigm

I have adopted interpretivism as my ontological assumption. Interpretivism allows the opportunity to interpret findings that can be shaped by personal and professional background (Creswell & Poth, 2018). An interpretivist ontology helps to orient my thinking about the significance of the research problem, including how I approach the research question. For example, this research is contextual in nature and has varying viewpoints with subjective truths that may arise from interactions with participants during interviews as well as the review of capstone content.

Given my strong clinical background as an occupational therapist, my epistemology values qualitative inquiry considering the complexities of people and context, including multiple realities and truths. I aimed to understand and describe how KT is reflected in entry-level OTD capstones as well as how KT can be promoted in capstones. My methodology consisted of a qualitative descriptive approach with methods comprising a content analysis of capstones and individual interviews with OTD faculty. Using a qualitative descriptive approach fit with an interpretive paradigm because it is

pragmatic but can also elicit rich data (Nayar & Stanley, 2014). Additionally, I borrowed from grounded theory methods, using a detailed codebook for constant comparative analysis.

Axiology refers to ethical issues during research, specifically understanding concepts of right and wrong behavior (Creswell & Poth, 2018; Kivunja & Kuyini, 2017). For example, the values that guided this research, or axiology, came from my experience as an occupational therapist with a growing interest in health profession education research. As a researcher, I maintained awareness of my beliefs and assumptions regarding my role in this research process. I established fair, trusting, and respectful rapport with participants during my one-on-one interviews with OTD faculty and review of the capstones. That said, I also recognized when it may be appropriate to bracket my own personal and professional beliefs. According to Creswell and Poth (2018), bracketing is the process of setting aside one's beliefs, feelings, and perceptions to remain open-minded.

Research Questions

In the initial inquiry phases of this qualitative descriptive research project, the primary aim was to better understand how KT is reflected in entry-level OTD capstones as well as how KT could be promoted in entry-level OTD capstones. As analysis of this study progressed, a sub-question emerged that provided additional direction for the study, especially concerning how KT could be promoted. This sub-question reflected the importance of understanding how entry-level OTD capstones were shaped by faculty perspectives. These final research questions were posed:

1. How is KT reflected in entry-level OTD capstones?

2. How can KT be promoted in entry-level OTD capstones?
    a. How are capstones shaped by faculty perspectives?

Statement of Potential Impact

The findings from this study have the potential to increase the capacity of OTD capstones to promote KT in the OT profession and ultimately patient care.

Theoretical Foundations

The knowledge-to-action (KTA) framework formed the basis of this study, as it guided the coding of the OTD capstone content as well as faculty perspectives on KT. I also utilized elements of complexity theory to provide a lens as this study progressed.

Knowledge-to-Action Framework

The KTA framework can be helpful with mapping the process for translating research into practice, including addressing barriers and assessing outcomes and sustainability (Graham et al., 2006). The KTA framework consists of two interconnected cycles: knowledge creation and knowledge action (Graham et al., 2006). With this framework, I preselected codes for a content analysis of completed capstone documents. The KTA framework was the most appropriate framework for this project, as it can identify and monitor the use of knowledge within the capstones while also determining how the students may have disseminated knowledge or planned to implement it.

Complexity Theory

Due to the complex nature of health profession education, as well as the complex and iterative nature of this research project, complexity theory provided insight as a

perspective that conceptualizes the relationships of individuals, including students and educators, and their complex situations (Mennin, 2013; Thompson et al., 2016). Additionally, as this research project evolved, using a complexity theory lens helped recognize the interactions between components of a system that result in the overall behavior of the system (Mennin, 2013; Thompson et al., 2016). Complexity theory has been described as a means of understanding how things are connected and how they interact (Sturmberg & Martin, 2013). Complexity theory is a synthesis of several ideas and theories aimed at addressing nonlinear dynamics of real-world systems, often referred to as complex adaptive systems (Sturmberg & Martin, 2013). By using complexity as a lens, I was able to see how components are interrelated and connected. As I zoomed in and analyzed each part, I also zoomed out to analyze the system as a whole, recognizing the consequences of the relationships between the parts.

Summary of the Methodology

This qualitative descriptive study involved two data sources: 10 completed capstones from two entry-level OTD programs and 12 interviews of OTD faculty. A feasibility study was completed using a sample of three capstone documents from a publicly available repository to help initiate calibration of coding (Appendix A). Purposive sampling was used to recruit faculty from OTD programs in the United States, including program directors, capstone coordinators, and other faculty who may have at least a foundational knowledge of KT and capstones. These faculty members were interviewed about their understanding of KT and how KT could be incorporated into capstones.

Rather than rely on existing qualitative method templates that did not fit this study (such as grounded theory), I used multiple methods. Due to the unique aspects of this project and the different types of data, it seemed appropriate to use multiple qualitative methods. This contemporary approach, described as "methodological bricolage" (Pratt et al., 2020), involves combining multiple analytic methods to solve a problem tailored to a research question (Pratt et al., 2020). The data analysis included a content analysis of completed entry-level OTD capstones and a qualitative descriptive analysis of interview transcripts from OTD faculty. Coding the capstones was mostly deductive, using the KTA framework to preselect codes. The interviews were mostly coded inductively to allow a more interpretivist view. Inductive coding was guided by grounded theory methods, including use of a codebook as an analytic tool and constant comparison. These approaches allowed analysis of data as a whole rather than in fragments (Anderson, 2010). Themes were then generated from the codes. NVivo qualitative analysis software was used for data analysis.

Although not a grounded theory study per se, grounded theory methods were quite relevant to this line of inquiry. Strauss and Corbin (1998) describe grounded theory methods as a technique to bring a vision to reality. Although the intent of this project is not to develop theory, using this method allows interpretation of the data in a more systematic way. For example, a code book was used as an analytical tool for constant comparison. According to Strauss and Corbin (1998) the purpose of analytic tools in grounded theory can include discovery of category subtleties, encourage the inductive process, and guide the researcher's thoughts away from the boundaries of academic literature and personal experience. This allows the researcher to ask questions and focus

on what is in the data (Strauss & Corbin, 1998). Having a detailed code book as an analytic tool allowed me to zoom in, write memos, and ask questions looking for concepts rather than just descriptions while also reflecting on potential bias.

After the first few interviews and discussion with committee members, I completed several follow-up interviews. These follow up interviews involved a more detailed interview sharing the KTA framework with questions about how the framework could be used with capstones, advantages/disadvantages of using it and what elements of the framework might be evident in the capstones. These follow-up interviews offered increased insight into each program's curriculum as well as understanding of KT. Codes continued to evolve with each review of the documents and transcription of the interviews. Themes were then generated from the codes. For example, once I had a few dozen codes, I wrote each code on separate sticky notes and began grouping and categorizing them, recognizing similar characteristics which helped with developing patterns. Saldana (2016) describes this process as using "tacit and intuitive senses" (p. 9) to recognize patterns. NVivo qualitative analysis software was mostly used for data analysis, however some analysis by hand occurred as this project evolved to discover and understand patterns and themes that emerged.

To maintain alignment throughout this study, I used an interactive model of research design, developed by (Maxwell, 2013). This model helps to ensure the research components are coherent and aligned. These five components include (1) goals, why the project is worth doing and what practices should be influenced; (2) conceptual framework, the theories, research, and prior literature that can guide the research; (3) research questions, what is unknown about the topic of interest and what the researcher

wants to better understand; (4) methods, the approaches and techniques for data collection and analysis; and (5) validity, interpretive and validity threats to findings and conclusions (Maxwell, 2013).

Limitations

One potential limitation was the difficulty accessing a representative sample of capstones from a variety of universities. The qualitative sample was limited to OTD faculty and capstones from universities in the United States that were invited to participate. Using the KTA framework as the approach to generate codes could also limit the analysis. Additionally, capstones were not a definitive indicator of how OTD programs may be teaching KT.

Assumptions

As an experienced occupational therapist with a growing interest in health profession education, I assumed that most capstones would have some elements of KT. False assumptions can lead to inauthentic results. I also assumed that OTD faculty would be honest and forthcoming about their experience and understanding of KT and how it is reflected in capstones.

Definition of Key Terms

American Council for Occupational Therapy: Advisory council of the executive board of the American Occupational Therapy Association.

American Occupational Therapy Association: National professional association that represents the interests and concerns of OT practitioners and students to improve the quality of OT services.

Bricolage approach: A contemporary approach to qualitive methods used to recognize the diversity of methods in qualitative research (Pratt et al., 2020).

Capstone: Scholarly project that represents a culmination of doctoral studies.

Complexity theory: A combination of several ideas and theories aimed at addressing the nonlinear dynamics of real-world systems, often referred to as complex adaptive systems (Sturmberg & Martin, 2013).

Evidence-based practice: Integration of "critically appraised research results with the practitioner's clinical expertise, and the client's preferences, beliefs, and values" (Association, 2021, p. np).

Knowledge-to-action framework: A cyclical framework created by Graham et al. (2006) from other planned-action theories and frameworks (Figure 2.1).

Knowledge translation: "The exchange, synthesis and ethically-sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of research" (CIHR, 2016, p. para. 4).

Qualitative descriptive research: A naturalistic approach used in research to gain an understanding of a phenomenon by accessing the meanings participants ascribe to it.

CHAPTER 2:

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The number of entry-level doctorate of occupational therapy (OTD) programs in the United States continues to grow. ACOTE (2020a) recently voted to expand the available openings for submission of candidacy applications from 6 to 12 per cycle. As of February 2020, there were 36 accredited OTD programs, 46 developing programs, and 88 applicant programs and at least 36 applicants on a waiting list scheduled out through 2025 (ACOTE, 2020b). New and existing OTD programs are all evaluated based on ACOTE (2018) Standard D.1., which requires a capstone project as an "integral part of the program's curriculum design" (p. 43).

Capstone projects offer an opportunity to embed KT into the curriculum and translate knowledge. Despite several calls to include KT in occupational therapy (OT) research, there remains a 17-year gap in which only a small percentage of new, evidence-based expertise is integrated into clinical practice (Juckett et al., 2019). As practitioner-researchers, OTD students have the potential to be content experts who can help close the research-to-practice gap and improve health outcomes in the United States.

After describing the methods for this literature review, this chapter summarizes literature on knowledge translation in the context of capstones and standards for the OTD program. It then presents the study's conceptual framework and its lens of complexity theory.

Methods of the Literature Review

The search strategy was an iterative process, utilizing a variety of methods due to the complex nature and inconsistent terminology of KT. Two electronic databases were searched, CINAHL and PubMed, along with reference mining (Table 2.1).

Table 2.1
Literature Search Strategy

Search	Database	Search Terms
Initial	CINAHL	"(Occupational Therapy OR Occupational Therapy Department, Hospital OR occupational therapist) AND ("implement*" OR "transfer" OR "translat*" OR translational medical research OR "knowledge broker*" OR "research utilization" OR "behavior change*" OR "knowledge to action" OR "integrated knowledge" OR "capacity building" OR "clinical decision making")
	PubMed	(Occupational Therapy [Mesh] OR Occupational Therapy Department, Hospital [Mesh] OR occupational therap* [tiab]) AND ("implement*" [tiab] OR "transfer" [tiab] OR "translat*" [tiab] OR translational medical research [mesh] OR "knowledge broker*" [tiab] OR "research utilization" [tiab] OR "behavior change*" [tiab] OR "knowledge to action" [tiab] OR "integrated knowledge" [tiab] OR "capacity building" [tiab] OR "clinical decision making" [tiab])
Updated*	CINAHL	• "occupational therapy AND doctoral" and "occupational therapy AND capstone" "education, doctoral AND capstone*" • "nursing AND doctoral" and "DNP AND capstone" "education, doctoral AND capstone*"
	PubMed	• (((doctoral[Title] OR capstone*[Title]))) AND "Nursing OR DNP"[Mesh].

*With focus on capstone.

Description and Critique of Scholarly Literature

Knowledge Translation: Broad View and Definitions

The term, knowledge translation (KT), was initially conceived by the Canadian Institutes of Health Research (CIHR) (CIHR, 2016). It defined KT as "the exchange, synthesis and ethically-sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of

research" (CIHR, 2016, para. 4). Since then, other terms associated with KT as well as other definitions of KT have surfaced, contributing to confusion (Graham et al., 2006; Straus et al., 2013). For example, terms such as *implementation, evidence-based practice (EBP), research utilization, dissemination,* and *KT* are often seen in the literature (Graham et al., 2006; Straus et al., 2013). Straus and colleagues (2013) recognized the term *knowledge* as encompassing many forms of evidence, "including research data, local (e.g. administrative) data, evaluation findings, organizational priorities, organizational culture and context, patient experience and preference, and resource availability" (p. 5).

Various institutions such as the National Center for the Dissemination of Disability Research (NCDDR), the National Institute on Disability and Rehabilitation Research, and the World Health Organization have adapted the definition by the CIHR. NCDDR (2005) defined KT as "the collaborative and systematic review, assessment, identification, aggregation, and practical application of high-quality disability and rehabilitation research by key stakeholders (i.e., consumers, researchers, practitioners, and policymakers) for the purpose of improving the lives of individuals with disabilities" (NCDDR, 2005, p. 4). The U.S. Department of Education's National Institute on Disability, Independent Living, and Rehabilitation Research defined KT as "the multidimensional, active process of ensuring that new knowledge gained through the course of research ultimately improves the lives of people with disabilities, and furthers their participation in society" (NIDRR, 2006, p. 8195). Lastly, Sudsawad (2007) reported the World Health Organization definition for KT as "the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health" (p. 1).

Although there are a variety of definitions of KT, there is agreement on the importance of moving knowledge to action. KT is an active, complex, and multistep process that requires stakeholder collaboration to identify, exchange, and apply knowledge to ultimately improve people's lives. KT is more than translating research and communicating research findings; it encompasses many ways of knowing (Straus et al., 2013). In other words, knowledge includes more than just research data. It is also evaluation findings, organizational culture and context, patient experience, and resources (Straus et al., 2013). It is important to include all aspects of knowledge to have the greatest impact.

This study used the original definition of KT from the CIHR. According to the CIHR (2016), KT has four elements: synthesis, dissemination, exchange, and ethically sound application of knowledge. Synthesis is the integration of individual research outcomes within the larger body of knowledge in a particular topic (CIHR, 2016). Dissemination includes identification of the intended audience and modification of the message and medium for the audience through activities such as educational sessions with intended stakeholders, creation of tools, or the writing of briefings or summaries (CIHR, 2016). Knowledge exchange is the "interaction between the knowledge user and the researcher, resulting in mutual learning" (CIHR, 2016, p. para 6). The CIHR (2016) defined two types of KT, integrated and end of grant. Integrated KT includes knowledge users throughout the research process, intending to increase the relevance and use of research findings by knowledge users (Andrews et al., 2012; CIHR, 2016). End-of-grant KT refers to the researcher's plan for making knowledge users aware of the knowledge gained during a project. Therefore, end-of-grant KT includes the typical dissemination

and communication activities undertaken by most researchers, such as translating knowledge to peers through conference presentations and publications in peer-reviewed journals (CIHR, 2016). There is also an expectation that knowledge from capstones will be disseminated, although how it is disseminated typically depends on specific OTD program requirements.

Knowledge Translation in Occupational Therapy

KT is a complex process requiring multiple steps focusing on the *know-do gap* between knowledge creation and its implementation (Govender & Mostert, 2019). "In other words, it is considered an active process that facilitates the introduction of evidence into practice to reduce the gap between research and clinical practice" (Govender & Mostert, 2019, p. 38). KT has been recognized as an important aspect of EBP within the allied health professions (Cramm et al., 2013). As demand for quality patient care grows, so does the need for KT strategies to influence clinicians to incorporate EBP (Cramm et al., 2013; Novak & McIntyre, 2010; Scott et al., 2012; Swedlove & Etcheverry, 2012). Although EBP has been adopted by practitioners and educators, implementation of EBP can be a slow and complex process that is often met with multiple barriers (Cramm et al., 2013; Govender & Mostert, 2019; Hitch et al., 2014). Utilizing KT can be a successful strategy to address these barriers (Cramm et al., 2013).

OT's ability to participate in KT must be established in ways that are responsive to the profession's context, as generalization from other professions may not capture the uniqueness of OT (Cramm et al., 2013). Given the occupation-based focus of the profession, along with the diversity of practice settings and patient populations with complex concerns, it is imperative to have access to relevant research (Cramm et al.,

2013). For example, OT is contextual, requiring the ability to confront complex and unique situations with clients, environments, and occupations. Numerous scholars have described the profession as a community often relying on experiential knowledge from peers and mentors (Cramm et al., 2013; Lencucha et al., 2007; Rappolt & Tassone, 2002; Swedlove & Etcheverry, 2012). Occupational therapists have difficulty finding relevant research that represents occupation-based treatment and takes into account the variety of practice environments, occupational performance challenges, and diverse client populations (Cramm et al., 2013). Throughout the information translation process, approaches must be reviewed and updated on a regular basis to meet the needs of the participants (Nilsen, 2015).

The research agenda from the American Occupational Therapy Association continues to push for increased research capacity, including KT (Burke et al., 2018). Translating new knowledge or facilitating EBP research into practice can be a complex process requiring consideration of multiple facilitators and barriers in context. It can be challenging for occupational therapists to find relevant and practical research to apply in an occupation-based way that attends to the various contexts and populations they typically treat, indicating the need for further research development (Cramm et al., 2013).

The pace of research in OT is gaining momentum, yet research will have minimal impact if outcomes are not translated into practice (Bennett et al., 2018). Multiple studies have investigated KT strategies in various health settings, and more are beginning to investigate KT in OT (Cramm et al., 2013). With an increased need to provide evidence-based care, interest in reducing the knowledge-to-action gap has also grown within the OT profession (Cramm et al., 2013). The relationship between knowledge and its

implementation is complex. In other words, the process is not linear but rather multidimensional and dynamic (Graham et al., 2006; Sudsawad, 2007). KT has provided a new tool to conceptualize evidence and practice. The concept has drawn attention to many factors beyond simply individual characteristics. Particularly, KT has highlighted the complex interactions that exist between practitioners and researchers. These interactions also include contextual factors such as organizational attributes, adding to the complexity of factors influencing how knowledge is translated into practice (Graham et al., 2006; Sudsawad, 2007).

This complex interaction opens an entire field of exploration for both occupational therapists and researchers in the OT field (Lencucha et al., 2007). The OT profession recognizes and advocates the importance of using KT in research and practice, yet utilization has been limited. The translation of evidence into OT practice is complex, often facing many barriers with minimally effective strategies to help with translation (Bennett et al., 2018; Donnelly et al., 2016; Lin et al., 2010; Perkins et al., 2020); Scott et al. (2012).

Another important reason to improve upon systematic implementation of knowledge is to measure the impact on not only the clients or the site, but the community. Kirkpatrick's (1959) model of evaluation was initially developed to evaluate organizational training and has since been modified as an evaluation tool for learning outcomes and program evaluation in higher education. Over the years, this model has been adapted by several scholars (Arthur et al., 2003; Milota et al., 2019; Praslova, 2010). For this study, the version adapted by Milota and colleagues was the most appropriate. The Kirkpatrick-based outcome levels include Level 1, participation; Level 2a,

modification of attitudes or perceptions; Level 2b, modification of knowledge and skills; Level 3, behavior change; Level 4a, change in organizational practice; and Level 4b, benefits to patients and outcomes. Capstones that are systematically implemented have an opportunity to facilitate change in each of these levels, but could have the most benefit for organizational practice and client outcomes.

Capstone Background and Purpose

While a variety of disciplines require doctoral degrees, such as physical therapy, chiropractic medicine, osteopathy, pharmacy, podiatry, and dentistry, Seegmiller et al. (2015) reported only four disciplines that require a culminating research project: doctor of nursing practice (DNP), doctor of clinical laboratory science, doctor of psychology, and OTD. The terminology for a culminating activity or experience in clinical doctoral degrees includes *capstone* and *scholarly project,* which are often used interchangeably in the literature. Research has identified the purpose of capstones in professional doctoral programs as the culmination of a scholarly program (Barlow et al., 2018; Hinojosa & Howe, 2016; Jirikowic et al., 2015; Roush & Tesoro, 2018), yet no consensus exists on the intent and breadth of the capstone project, including how it might demonstrate competencies. Some nursing scholars have defined capstones as a way to facilitate students' integration of their theoretical knowledge from coursework with clinical knowledge (S. J. Barlow et al., 2018; Kirkpatrick & Weaver, 2013). The considerable variance in definition of the capstone project has generated questions about the consistency of scholarly rigor and quality (Burke et al., 2018).

Numerous DNP scholars have published articles about capstones in DNP programs, including their rigor, value, impact, quality, and innovation (Huber et al.,

2018; Kirkpatrick & Weaver, 2013; Root et al., 2018; Roush & Tesoro, 2018; Terhaar & Sylvia, 2016; Wall et al., 2005). Wall et al. (2005) discussed a DNP model curriculum integrating a systems thinking process and interprofessional collaboration in which implementation of an evidence-based clinical project could support KT for the benefit of patients and the community. Roush and Tesoro (2018) evaluated the rigor and value of final scholarly projects in several U.S. DNP programs. Using the DNP Project Appraisal Tool, they assessed 65 DNP projects, finding variability in rigor and value, especially concerning the evaluation of the implementation phase (Roush & Tesoro, 2018). According to Roush and Tesoro (2018), the goal for DNP students is to "engage in practice-scholarship that will improve healthcare and outcomes through organizational/ systems leadership, quality improvement process, and translation of evidence to practice" (p. 437); however, only a small percentage of these scholarly projects were implemented. Both Root et al. (2018); and Terhaar and Sylvia (2016) evaluated scholarly projects and found a lack of rigor until they implemented project assessment criteria and curriculum changes, respectively. Huber et al. (2018) conducted a content analysis of DNP capstones to evaluate scope of leadership and proposed a framework to guide how to evaluate projects. Kirkpatrick and Weaver (2013) conducted interviews with nursing scholars on capstone expectations, including clarifications on value, form, and key elements. All of these studies illustrate the value and importance the nursing profession places on capstone projects. There is limited research investigating OT capstones, thus prompting this qualitative study.

Most of the literature on OTD capstones has been published in the last few years, reporting capstones as essential to OTD curricula and the various designs the projects can

take (Delbert et al., 2020; Stephenson et al., 2020). One study investigated the use of a framework for capstones and clinical fieldwork education development (Delbert et al., 2020). This Systems and Experiential Learning (S.E.L.F.) Framework offers a pedagogical structure to maximize fieldwork and capstone delivery (Delbert et al., 2020). Jirikowic et al. (2015) evaluated capstones from their entry-level master's program, with the aim of determining how the scholarship of application from Boyer's scholarship model (Boyer, 1992) aligns with their capstone model. They found both strengths and limitations in their model but reported that capstones offer benefits to students, faculty, and the community through the scholarship of application by facilitating scholarly endeavors while also fostering leadership roles (Jirikowic et al., 2015). Capstones are common in health profession graduate programs as a means of providing integration of didactic knowledge and real-world application.

A capstone facilitates opportunities for students to integrate their theoretical knowledge from coursework with clinical knowledge (Barlow et al., 2018). Bilics and colleagues (2016) discuss the importance of occupational therapy (OT) and research as OTs are committed to scholarship engagement. The profession recognizes a variety of academic endeavors necessary to advance the profession, including "learner interest in their own professional growth and understanding." (Bilics et al., 2016, p. 1). For example, Boyer's Model of Scholarship (Boyer, 1992) provides a variety of approaches in scholarship that could guide options for capstones in an applied doctorate program such as the OTD. Boyer's Model includes scholarship in five areas, scholarship of discovery, integration, application, or teaching and learning (Boyer, 1992). Bilics et al. (2016) defines scholarship of application as, "practitioners apply the knowledge

generated by scholarships of discovery or integration" (p.2) and also describes it as knowledge translation.

History of the Doctorate in Occupational Therapy

A professional doctorate degree as defined by the U.S. Department of Education (2020) National Center for Education Statistics is a

> degree that is conferred upon completion of a program providing the knowledge and skills for the recognition, credential, or license required for professional practice. The degree is awarded after a period of study such that the total time to the degree, including both pre-professional and professional preparation, equals at least six full-time equivalent academic years. (p. 10)

OT entry-level education has evolved from a baccalaureate to a master's degree and most recently to an entry-level doctorate degree, with the first OTD program accredited in 1998. The option to pursue a master's degree rather than a doctorate degree is still available, and currently licensed practitioners can also pursue a post professional doctorate. As of April 2019, the American Occupational Therapy Association's Representative Assembly decided occupational therapists could have the option of entering a program at the master's level or doctorate level. The Representative Assembly sets the standards for the scope of practice and the degree required for entry into the profession (American Occupational Therapy Association, 2014), while ACOTE sets the education standards for OT educational programs. The number of entry-level and post professional doctorate programs has increased over the last several years, with 173 programs in various levels of accreditation, from new applicants to fully accredited, as of May 2020 (ACOTE, 2020b).

Evolution of Accrediting Standards

ACOTE sets the standards for all OT programs, including OT assistant programs and master's level and entry-level OTD programs, to ensure the competency of future practitioners. Accreditation standards for entry-level OTD programs were first introduced in 2006, and by 2015 there were six accredited entry-level OTD programs (ACOTE, 2020a). ACOTE standards were updated in 2011 and 2018. The 2018 version of standards was implemented in June 2020, with several changes implemented in the latest version. The standards most relevant to the capstone were of interest in this project. For example, Standard D.1.3, Preparation for Doctoral Capstone Project, states:

> Ensure that preparation for the capstone project includes a literature review, needs assessment, goals/objectives, and an evaluation plan. Preparation should align with the curriculum design and sequence and is completed prior to the commencement of the 14-week doctoral capstone experience. (ACOTE, 2018, p. 45)

This was a new standard in the latest revision. This revision affects the capstone and curriculum because the needs assessment is now required before the start of the capstone experience, whereas previously it was not specified when it was done but it typically was completed on site during the capstone.

The revision that had the greatest effect on the capstone seems to be the 2011 Standard B.8.0: "Promotion of scholarly endeavors will serve to describe and interpret the scope of the profession, establish new knowledge, and interpret and apply this knowledge to practice" ((ACOTE), 2011, p. 30), which changed in 2018 to Standard B.6.1: "Design and implement a scholarly study that aligns with current research priorities and advances knowledge translation, professional practice, service delivery, or

professional issues (e.g., scholarship of integration, scholarship of application, scholarship of teaching and learning)" (ACOTE, 2018, p. 36).

Summary

This review and critique of the literature illustrates what is known and unknown regarding KT and how it relates to OT. Entry-level OTD programs continue to expand and evolve and have had a recent accreditation standard change affecting capstone projects. A capstone is integral to the OTD curriculum, offering opportunities for students to engage in scholarship of application, or KT. Scholarship is needed to advance the OT profession as well as benefit community partners. The recent educational standard change suggests a scholarly project that advances KT. The capstone brings an opportunity for students to engage in a variety of practice areas, which helps build research capacity and apply knowledge to practice. OT practitioners and researchers have identified a multitude of barriers in utilizing EBP, so it stands to reason that there are barriers to utilizing KT.

KT has been a trending topic for nearly two decades in OT, but confusion over terminology and purpose continues. Yet, agreement remains on the importance of moving knowledge to action. Increasing the capacity to utilize KT in research and practice can benefit not only patients and clients but practitioners and students. DNP programs have recognized this need and have illustrated the value of nursing education and their scholarly projects. While the use of KT in OT practice and research has improved, a gap still remains in OT education. It is important to prepare students to be competent professionals and advance the profession through KT.

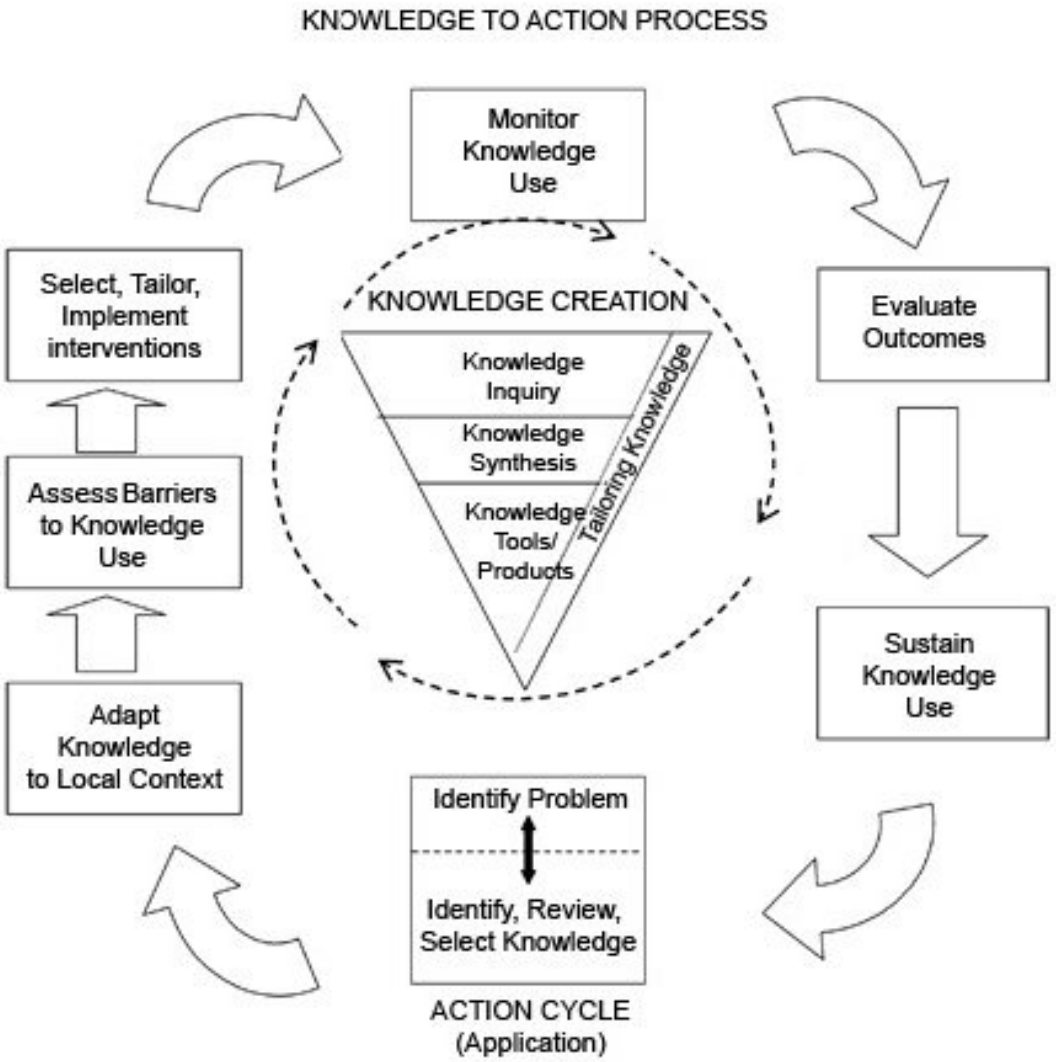
Conceptual Framework

According to Maxwell (2013), a conceptual framework is "a system of concepts, assumptions, expectations, beliefs and theories that supports and informs your research" and is "a key part of your design" (p. 39). This framework, as it is constructed and evolves, guides research by providing a structure to organize and support ideas (Maxwell, 2013).

Knowledge-to-Action Framework

The knowledge-to-action (KTA) framework (Figure 2.1) can be helpful in mapping the process of translating research into practice, including addressing barriers and assessing outcomes and sustainability (Graham et al., 2006). The KTA framework includes two interconnected cycles: knowledge creation and knowledge action (Graham et al., 2006). Knowledge creation includes the three phases of knowledge inquiry, synthesis, and knowledge tools. The action cycle involves assessing barriers to using the knowledge, adapting the knowledge to a local context, implementing the intervention, monitoring its use, evaluating outcomes, and sustaining knowledge use (Graham et al., 2006). Specifically, the action cycle of the KTA framework is important when introducing the KT process to clinicians (Bennett et al., 2016).

Figure 2.1
Knowledge-to-Action Framework



The middle of the KTA framework (shaped like a funnel) addresses *knowledge creation,* consisting of new knowledge and existing research that can be used in healthcare (Graham et al., 2006). The top phase of knowledge creation includes *knowledge inquiry,* which typically includes new knowledge and primary studies (Graham et al., 2006). The middle phase, or *knowledge synthesis*, includes a collection of existing knowledge from various studies to appraise and synthesize, much like a

systematic review would do (Graham et al., 2006). The presentation of knowledge, as with a journal club or practice guideline, comes from the third phase of the funnel called *knowledge tools and products* (Graham et al., 2006). As new knowledge is discovered, it funnels through these phases where it begins as empirical or experiential knowledge and then synthesized down from primary studies to a systematic review or meta-analysis (Graham et al., 2006; Straus et al., 2013; Sudsawad, 2007). That knowledge is then synthesized further to a useful knowledge product or tool such as guideline or patient decision aides where it then becomes useful to a knowledge user to be implemented into practice. Each of these phases in knowledge creation can be tailored to meet the needs of stakeholders.

Outside of the funnel is the action cycle, or the application piece of the knowledge. This is the part of the process that typically leads to implementation or application of knowledge and includes the activities that may be needed to apply the knowledge. Graham and colleagues (2006) suggested that these phases are dynamic, often influencing each other, and they are influenced by the phases of knowledge creation.

The purpose of using this framework was to preselect codes for a content analysis of completed capstones. The KTA framework was the most appropriate framework for this project, as it can serve as a tool to describe how KT is operationalized within the capstones.

Complexity Theory as a Lens

Complexity theory is a lens and a synthesizing structure in which complexity itself is an emergent effect (Mennin, 2010). Due to the complex nature of health

profession education, as well as the complex and iterative nature of this research project, complexity theory provided insight as a perspective that conceptualizes the relationships of individuals, including students and educators, and their complex situations (Mennin, 2010; Thompson et al., 2016). Additionally, as this research project evolved, using a complexity theory lens helped me recognize the interactions between components of a system that result in the overall behavior of the system (Mennin, 2010; Thompson et al., 2016). Learning is a dynamic and complex process dependent on many factors that interact in a nonlinear way (Mennin, 2010; Thompson et al., 2016). Complexity theory allows us to have a more flexible range of approaches to problems and to the translation of knowledge.

Complexity theory reminds us of the dynamic nature of KT, especially in healthcare education. Educating future clinicians is not a linear process, but one with complexity and emerging dynamics. KT has been recognized as a multistep, complex, and interactive system. It requires synthesis of all ways of knowing (Straus et al., 2013). All ways of knowing require consideration, including student life experience and ways of thinking and doing and learning. Enabling the learning, creativity, and adaptive capacity of OTD students can facilitate the emergence of knowledge. This theory is discussed throughout the following chapters to illuminate the dynamics of this project, the relationships between themes, the interactive nature of KT, and the promotion of KT in capstones.

CHAPTER 3:

METHODS

The purpose of this qualitative descriptive study was to describe how knowledge translation (KT) is reflected in entry-level doctorate of occupational therapy (OTD) capstones and derive guidelines for promoting KT in capstones. The qualitative data consisted of completed entry-level OTD capstones from two different universities collected via publicly available web-based repositories. Data were also collected from interviews with OTD faculty from 10 different universities. Data were analyzed using a bricolage approach (Pratt et al., 2020), or a variety of methods, including content analysis of the completed capstones and qualitative descriptive coding of interviews using select methods from grounded theory. This chapter describes the design and procedures of the study, including the research sample and the data collection and analysis methods used. Additionally, a pilot study was completed with three publicly available capstones to help initialize a coding structure and measure the feasibility of this research study. The results of the pilot study can be found in Appendix A.

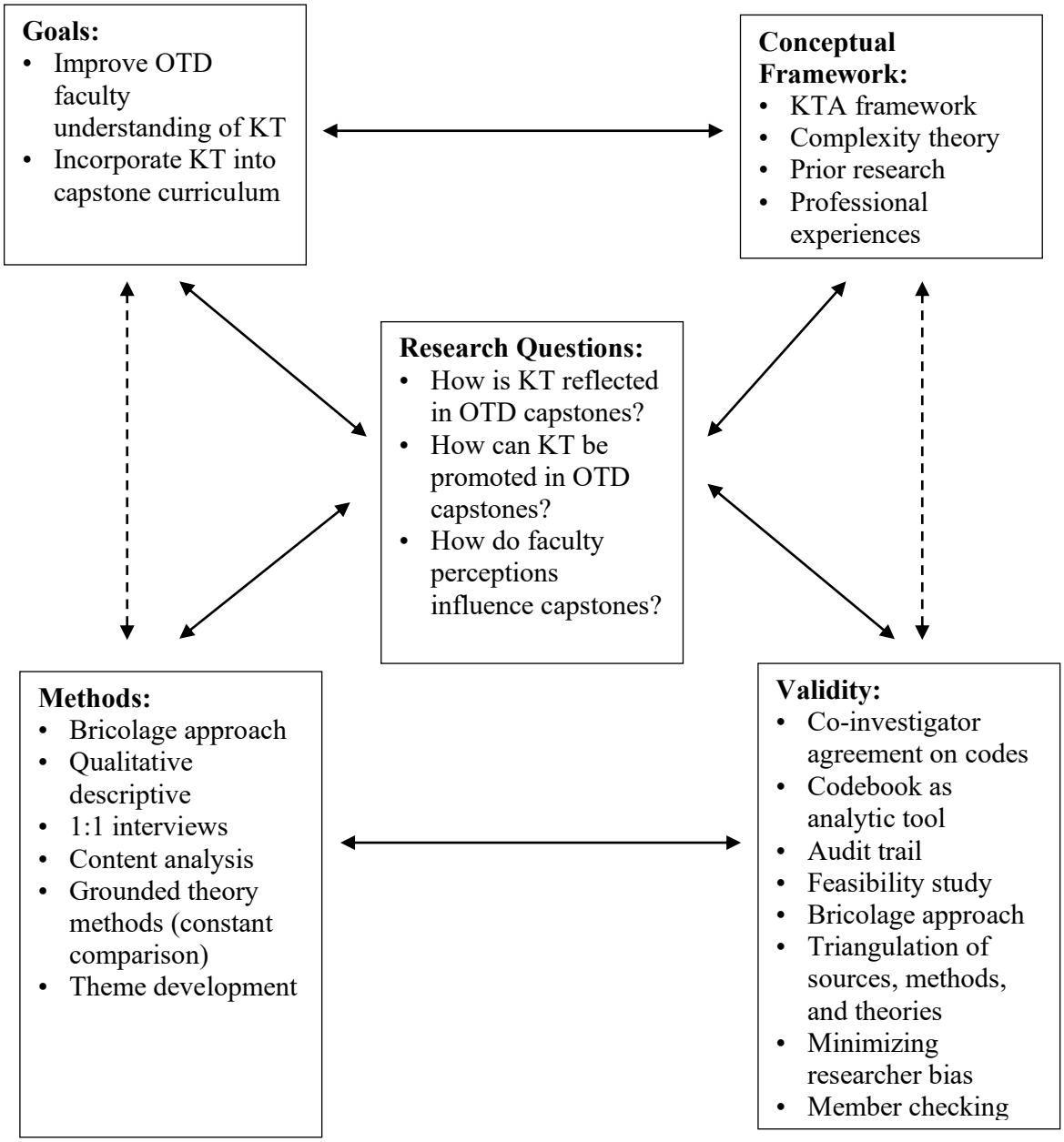
Research Design

Rationale for Qualitative Methodology

This research called for a qualitative methodology. A qualitative approach was chosen to make sense of how OTD capstones may reflect KT. Using this approach allowed me to interpret findings based on the analysis of interview transcripts and the capstones. Qualitative research is inductive in nature and does not follow a strict sequence; rather, it uses a reflexive process throughout each step of the project (Maxwell,

2013). In order to ensure alignment, this study used a model of research design developed by Maxwell (2013) (Figure 3.1). The interactive model of research design helped to understand alignment of the overall study, including the goals, conceptual framework, methods, validity, and research questions (Maxwell, 2013).

Figure 3.1
Study Research Design Based on Maxwell's Model



Briefly, the goals of this study were to improve OTD faculty understanding of KT and bring KT to the capstone curriculum. The conceptual framework included a combination of professional experiences as an occupational therapy (OT) clinician and educator, existing theories, prior research, and literature on KT and OT education. Qualitative methods used in the study included a bricolage approach that involved content analysis of documents, individual interviews, deductive and inductive coding, and constant comparative analysis using a codebook as an analytic tool. Validity for this study was addressed by recognizing threats and bias such as researcher bias and interpretations, as well as potential feelings of obligation by participants to answer questions in a certain way. Additionally, an audit trail with triangulation of sources, methods, and theories was used to address validity and trustworthiness.

Historically, anthropology, sociology, and the humanities were the first disciplines to use qualitative research (Creswell & Creswell, 2018). The definition of qualitative research is ever evolving; however, Denzin and Lincoln (2011) defined it as "a situated activity that locates the observer in the world" that "consists of a set of interpretive, material practices that make the world visible" (p. 3). Qualitative research has an interpretive and naturalistic approach, where a researcher conducts the study within its natural setting, interpreting phenomena (Denzin & Lincoln, 2011). While Denzin and Lincoln (2011) and Creswell and Poth (2018) have agreed that qualitative research emphasizes an interpretive, naturalistic approach to inquiry, Creswell and Poth (2018) went beyond that, emphasizing distinct approaches to research design. Specifically, Creswell and Poth (2018) offered the following definition: "Qualitative research begins with assumptions and the use of interpretive/theoretical frameworks that

inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem" (p. 8). By using interpretivism as my paradigm, I recognize that this research is contextual in nature with varying viewpoints and subjective truths. I also recognize how my assumptions helped to orient my thinking about the significance of this research problem, the type of qualitative inquiry, and the complexities surrounding it.

Descriptive Research with a Bricolage Approach

There are many types of qualitative research, including the more commonly recognized ethnography, grounded theory, phenomenology, and case study approaches (Creswell & Poth, 2018). For this research, I used a qualitative descriptive approach with a content analysis method to analyze the capstone documents. Interview transcripts from OTD faculty were analyzed using deductive and inductive analysis. In addition to the qualitative descriptive approach, I used methods typically associated with grounded theory. These included constant comparison and use of the codebook as an analytical tool. Using a variety of qualitative methods has been called a bricolage approach (Pratt et al., 2020).

Qualitative descriptive has been described as a pragmatic design that can generate rich data, especially in the OT field (Nayar & Stanley, 2014). While the field is wide and a spectrum of research designs have been used, OT can be difficult to "reduce to discrete variable that can be measured and controlled" (Nayar & Stanley, 2014, p. 4) due to complex factors such as occupational engagement and the diversity of individuals and environments. A qualitative descriptive design, as Sandelowski (2010) described it, is interpretive and often draws from a naturalistic inquiry. Although qualitative descriptive

inquiry is not guided by a specific philosophy, Denzin and Lincoln (2011) agreed that this methodology fits into an interpretive paradigm. Using a qualitative descriptive research design allowed me to achieve a thorough description of completed OTD capstones and their use of KT, including how it is reflected in the capstone and how KT could be promoted in entry-level OTD capstones.

Although the purpose of this study was not to generate theory, some methods from grounded theory were used. According to Chun Tie et al. (2019), grounded theory can be an inquiry method. Using constant comparison as an analytic process is a systematic approach to coding and theme development (Anderson, 2010; Chun Tie et al., 2019). Additionally, the codebook was used as an analytic tool. This involved constant comparison, comparing each initial code to other codes, which were then merged into themes. Constant comparative analysis was initially described by Glaser and Strauss, who have been identified as the founders of grounded theory (Chun Tie et al., 2019). This technique allowed for continuous refining of codes and themes, including more abstract concepts, allowing me to treat the data as a whole rather than in fragments (Anderson, 2010; Chun Tie et al., 2019).

Data Collection

The selection of settings and participants is purposeful in qualitative research and includes data collection in a natural setting considerate of the people under study and anticipating any ethical issues that may arise (Creswell & Poth, 2018). This study was submitted for review and approved by the George Washington University institutional review board (IRB) as exempt (NCR202634).

Data for this study consisted of two types: documents and interviews. Documents were selected from web-based repositories of publicly available completed entry-level OTD capstones. Data collection also included interviews with a purposeful sample of faculty at all US-based accredited entry-level OTD programs, including program directors, chairs, and capstone coordinators as well as other faculty with foundational knowledge of KT in the Accreditation Council for Occupational Therapy Education (ACOTE) standards. Confidentiality was ensured by giving each capstone and participant a number that only I had access to, with the key password protected.

Capstone Document Review

Since the desired documents and participants were all from OTD programs, their information was easily accessed from the ACOTE website. The inclusion criteria for the capstones was that they were from entry-level OTD programs, were publicly available, and were in the form of a written document, specifically a Word or PDF file rather than a poster or slide presentation.

Each OTD program website was manually searched for publicly available capstone documents. Out of the 38 programs, six programs had capstones publicly available. After further in-depth searching, it was discovered that only two of those programs met the document inclusion criteria. Among the four programs did not meet inclusion criteria, one program had only post-professional capstone documents available, and the other programs had only posters or PowerPoint presentations available. This discovery was discussed with my committee chair, who agreed I should keep going with the methods as approved by the IRB. During the interview, I asked participants if they

had publicly available capstone documents that I may have missed in the initial search, but none did.

The final sample included capstones from two entry-level OTD programs. These documents were randomly selected based on what was available in the web-based repository. An interesting observation was that more were available for most recent years, especially 2020. One school had capstones available as far back as 2010, although those documents were only abstracts and did not meet my inclusion criteria. Although these documents were randomly chosen, I did choose a few from earlier years as far back as 2014. Although only two OTD schools met the inclusion criteria, those schools represented both the East and West Coasts of the United States. Both were private schools.

The documents used were between 30 and 100 pages, which provided rich content to be analyzed. They were downloaded as pdf files on a personal, secured computer and then converted to Microsoft Word documents to increase ease of deidentification. The utmost care was taken to deidentify these documents as thoroughly as possible by using the Find function in Microsoft Word to search student name and school and then replace that text with "XXX." This process was completed for each capstone while also hand searching and scanning to ensure any identifying material was deleted or replaced with "XXX." This process caused a few issues later, as some projects specifically named various facilities, daycare centers, hospitals, etc., which required another round of de-identifying. This was completed to the highest standard possible. Confidentiality of these documents and participants was of the utmost importance. Communication with committee members remained transparent throughout this process, especially since one

committee member agreed to directly supervise data coding. Upon de-identification, capstones were uploaded into Box, a secure document storage platform administered by GWU, and shared with the committee chair and a committee member who were named co-investigators through the IRB.

Participant Recruitment

After accessing the list of accredited entry-level OTD programs from ACOTE, I developed a spreadsheet that included the school name and website addresses. Each school website was manually searched to collect names and e-mail addresses for the program director and capstone coordinator. This information was entered into the spreadsheet. The spreadsheet also included a note if the individual had any special knowledge or experience in KT. Upon receiving approval from the IRB, a recruitment letter (Appendix B) was individually emailed to 38 OTD entry-level programs, including 27 program directors and nine program chairs. Potential participants were informed of the study purpose and their right to privacy and anonymity throughout the study.

Several faculty members enthusiastically responded to the recruitment letter the day it was sent, and several asked if they could forward the email to other faculty. I replied to everyone the same day with a tentative timeline for conducting interviews once the first part of analysis with capstone coding was completed. Methods and communication strategies continued to be confirmed with committee members throughout this time. A working spreadsheet with participant contact information and communications was updated as needed. This was secure and password protected to continue to protect participants' identities.

For two programs, no contact information was listed; however, communication was initiated through their website contact form. One school had several campuses, making it difficult to navigate who the program directors and capstone coordinators were. I used a professional connection to help forward the recruitment email letter to the appropriate people.

The final number of participants was 12, representing a variety of geographic locations from the Pacific Northwest to the Southeast. Additionally, participants had a range of experience, from veteran capstone coordinators of over 20 years to new capstone coordinators of 1 year. Program director participants also had a range of experience, from 1 year to over 15 years. One participant happened to be from one of the two programs that offered public access to their capstones.

Participant Interviews

Each participant signed an informed consent document (Appendix C) through Adobe Docu-sign before the interview. IRB-approved procedures were used to record and securely store interviews and transcripts of interviews. WebEx was used to record interviews, and Box was used to share the documents with two committee members who were also approved as co-investigators through the IRB, while maintaining confidentiality. Both software programs were available from and approved by the George Washington University.

The interview procedure began with an email communication sent to the participant to confirm the interview appointment. Once the appointment was confirmed, the participant logged on to WebEx, where we introduced ourselves and I explained the process and expectations. After the participant agreed to continue with the interview, I

asked them to turn off their video so I could record just the audio, based on the exempt status from the IRB. I then used my semi-structured interview guide (Appendix D) to ask questions and conduct the interview.

As a novice researcher, I found the process to be a learning opportunity. After I conducted the first few interviews, I realized I was not getting the exact information I needed. I discussed this realization with Dr. Herrmann (the methodologist on the committee), who suggested that I add in a few more questions about the knowledge-to-action (KTA) framework and show the framework diagram to the participants. We confirmed this plan with Dr. Corcoran and Dr. Krusen, who both agreed with the interview modification. I then moved forward with more interviews with the additional questions and shared the diagram. This proved successful, so I then went back and conducted follow-up interviews with the first few participants. The new process was much more informative and provided a much richer interview, as I was able to gain more perspective about how programs' curriculum and capstones reflected KT. The participants were also able to engage more in the interview with an example of a KT framework. They were able to recognize some of the KT constructs and the similarities to their curriculum design.

Data Analysis

In qualitative research, data collection, analysis, and reporting are interrelated, typically being performed simultaneously in a project (Creswell & Poth, 2018; Maxwell, 2013). Analysis for this project involved a variety of methods, or a bricolage approach (Pratt et al., 2020). These methods included a content analysis of completed entry-level OTD capstone documents, qualitative descriptive coding of interview transcripts from

OTD faculty, as well as select grounded theory methods such as constant comparison. Krippendorff (2018) described content analysis as “an empirically grounded method, exploratory in process, and predictive or inferential in intent” (Krippendorff, 2018, p. 2) that involves a systematic review of texts in order to make objective inferences. Qualitative descriptive analysis is a pragmatic design yielding rich data while also fitting into an interpretive paradigm (Nayar & Stanley, 2014). Using select methods from grounded theory allowed for constant comparative analysis and discovery of emerging codes, categories, and their interrelationships (Strauss & Corbin, 1998). This bricolage approach was a good fit, allowing me to adapt the analysis to the research objectives (Pratt et al., 2020) and emerging results.

A qualitative software program, NVivo, was used to code and provide visual queries such as codes matrices, cross tabs, and code comparisons. This not only assisted in the analysis, but allowed digital organization and management of the data. The software also offered an opportunity to record and organize memos of emergent ideas and thoughts. These memos were easily linked to the data within the software. Memo writing can be analytical and abstract, allowing for concept creation, formulation of comparisons, and clarification of coding (Saldana, 2016).

I approached my role as a researcher from an emic, or insider, perspective. I was an active participant as I conducted the interviews with OTD faculty. During the interviews, I also created memos as ideas and thoughts surfaced. Additionally, during the coding process, I worked with an additional coder (Dr. Herrmann) to ensure trustworthiness. Feedback on early data interpretations is important to coding and data analysis (Saldana, 2016).

Data analysis was an iterative process and involved both inductive and deductive coding. General codes were initially preselected from the KTA framework. This framework allowed me to establish a general sense of what the capstones were saying about KT. Through an inductive process, I refined the general coding with subcodes. Integrating inductive and deductive strategies allowed an opportunity to continually interpret the data through a broad lens as well as a more focused lens, identifying details and general perspectives (Creswell & Poth, 2018). There was a constant zoom in and zoom out approach with an openness to the process. The interviews were also coded using two different strategies, including preselected categories as well as emergent categories. Using this combined approach allowed me to explore the topic holistically, leaving space to discover unpredicted aspects of capstone content and participant experiences and knowledge. The following sections provide more detail on the analysis of documents and interviews, as well as the overall analysis.

Capstone Analysis

Initial coding of the capstones utilized a priori codes from the KTA framework. As these capstones were coded, codes evolved and new codes emerged. Initial codes were chosen based on the seven steps of the KTA framework action cycle. These codes were entered into NVivo. Capstone documents were also uploaded into NVivo and into the secure document management system, *Box*. Two committee members had access to these documents, as approved by the IRB.

Dr. Herrmann (the methodologist) was instrumental in the initial coding process to increase trustworthiness, providing feedback on codes and definitions. Dr. Herrmann and I individually coded the first capstone. We then met to compare analysis and discuss

any discrepancies. I then proceeded to update the codebook as needed while coding the remaining capstones. Dr. Herrmann and I met every other week via video chat to discuss codes and evolving subcodes. As the coding proceeded, there were fewer discrepancies and more agreement.

Interview Analysis

A combination of inductive and deductive coding was used for the interviews. First, I read each transcription and highlighted interesting text that seemed to answer my research questions. Initially, I had a few dozen codes during the first pass. As I became more familiar with the data and used constant comparative analysis, codes were merged. For example, the topic of the curriculum was strong, as most participants discussed how they were changing their curriculum to meet the new ACOTE standards. Initially, the data steered toward topics such as curriculum timelines, specifically how programs had moved the needs assessment from being completed on site during the experiential portion of the capstone to now being completed two semesters before the capstone experience. Also, participants talked about the emerging and changing curriculum. After a second pass and increased familiarity, codes were merged into one code, evolving curriculum. I believe the new code provided increased clarity of what the programs were doing and how the ACOTE standards had influenced changes, especially since each program was at a different stage of implementing the new standards.

The coding process was kept iterative and dynamic during the entire analysis and writing phases. Deciding which coding methods are most appropriate can be challenging, but qualitative research allows for customized approaches to suit the needs of the project (Saldana, 2016). Having two sets of data also proved a bit challenging. Initially I had

decided to code the capstone documents and interviews separately in NVivo, as the documents were more deductively coded while the interviews were more inductively coded. After reviewing the documents and transcripts the first time, I realized I could still code them as initially planned, deductively and inductively, while keeping them together in the same file on NVivo. This allowed emergent codes to develop as well as the ability to view this project as a whole, including the emergent interrelationships. Using a complexity theory lens helped me to reason through this process, zooming in and zooming out. During the coding phase, it is easy to get lost in the details, but having the flexibility to use both inductive and deductive coding allowed for customization to suit the needs of the study (Saldana, 2016).

Creating a codebook (Appendix E) was necessary during this process as a way to keep a record of emergent codes and their definitions. Saldana (2016) described the codebook as a collection of codes with definitions and brief data examples. NVivo was used to help track the codebook iterations. Each codebook version was downloaded from NVivo and then uploaded into *Box* to maintain transparency with my committee during this project. As stated earlier, the codebook was also a living document and used as an analytic tool for constant comparison, a method often used in grounded theory. Having the dynamic codebook allowed me to track emergent codes, ask questions, memo, refine definitions, and reflect on emergent themes. The final coding results included 55 codes organized in a code book.

Overall Data Analysis

After all data were coded, I used a variety of features in NVivo, such as word count queries, code comparisons, matrices, and cross-tab analysis to merge codes, create

themes, and visualize the data. For example, using the cross-tab function allowed me to separate and combine various codes within and across data to discover themes. Additionally, a coding matrix with a heat map helped to visualize all the codes at once to recognize where themes could emerge. Multiple iterations of coding matrices were developed to help visualize only the capstone document codes, only the interview codes, or all the codes together. These software functions helped me filter, group, and compare codes, allowing me to make connections and identify themes and relationships. While the software helped with basic data management and initial coding, it was difficult to gain substance and recognize the complexities and nuances of the data. Similarly, Saldana (2016) noted that analytic software is best for data management but may fall short in discovering the complexities. A coding scheme was created to illustrate the research thought process of merging codes and memos into themes. According to Saldana (2016), coding schemes continue to evolve throughout the analysis.

Trustworthiness

Because of my experience as an occupational therapist, researcher biases were clarified from the beginning. I believe that by being an experienced occupational therapist, I developed a rapport with participants and gained their trust, which enhanced honesty and built authenticity, allowing more open discussion. I also required participants to turn off their video during the interview to help increase trust and anonymity, thereby reducing the risk of feeling obligated to answer questions in a certain way. I utilized participant feedback, or member checking, to increase credibility by asking participants to review the data analysis and my interpretations to ensure accuracy (Creswell & Poth, 2018). Throughout the content analysis and interviewing process, I maintained self-

reflexive memos and an audit trail to illustrate how data can be traced back to its origins. An audit trail serves as a validation strategy (Creswell & Poth, 2018). This audit trail consisted of a living codebook, which was also used as an analytic tool and was shared with committee members. Additionally, Dr. Herrmann and I met weekly to discuss coding strategies and changes to help strengthen validation and trustworthiness.

Human Participants and Ethics Precautions

Before collecting data, an exempt review was obtained from the IRB (Creswell & Poth, 2018). Consent from OTD faculty was obtained prior to individual interviews. A distraction-free site was used for the interviews with OTD faculty.

Data collection involved individual interviews of OTD faculty using open-ended questions from a semi-structured interview guide. The interviews maintained an iterative process with probing questions as needed, anticipating a collaborative relationship. The interviews were recorded while the participant's camera was turned off, thus recording only the audio, further maintaining privacy and limiting the potential for participants to feel obligated to answer questions a certain way. Field notes were taken during interviews and observations. Field issues were minimized by seeking consent while maintaining participant confidentiality.

Data were stored securely while protecting the anonymity of participants. Capstones were collected from publicly available repositories, which were then deidentified to maintain anonymity and confidentiality. This study did not include any identifying information from the participants or the documents. Identities were not revealed to anyone else. Each document and participant was assigned a number. Great

care was taken to ensure that any other information perceived as identifiable was removed.

Chapter Summary

This qualitative descriptive study included two different sets of data. One set included 10 publicly available capstone documents from two different entry-level OTD programs. The other set comprised interviews of 12 faculty members from entry-level OTD programs at 10 different universities. Participants represented every region in the country with a wide range of teaching experience. Their current academic occupations included program director, capstone coordinator, and full-time faculty member.

Both capstone documents and interview transcripts were de-identified and maintained on a secure drive with limited access by IRB-approved investigators only. Security and participant privacy was of the utmost importance. Informed consent was confirmed and documented by all participants. An audit trail of all documents, data, and analysis is complete and secure. Transparency through the entire process was key to maximizing trustworthiness. Personal and professional biases were also transparent throughout this study.

Data collection and analysis occurred simultaneously, with an immersive approach that was iterative throughout the deductive and inductive process. The analysis was conducted with a bricolage approach, using a variety of qualitative methods. Methods included content analysis, qualitative descriptive coding, and select grounded theory methods. The combination of methods allowed a more holistic approach. Fifty-five codes emerged from a combination of deductive and inductive coding. A detailed

codebook was used as an analytic tool and for constant comparison. Data analysis was completed on NVivo, which provided data management and initial coding and codebook creation. NVivo was also used to organize and sort codes through various methods, such as matrices and code comparisons. Through constant comparison analysis, relationships were discovered between and within codes, leading to themes. The findings are presented in the following chapter.

CHAPTER 4:

RESULTS

This qualitative descriptive study addressed two research questions with one sub-question:

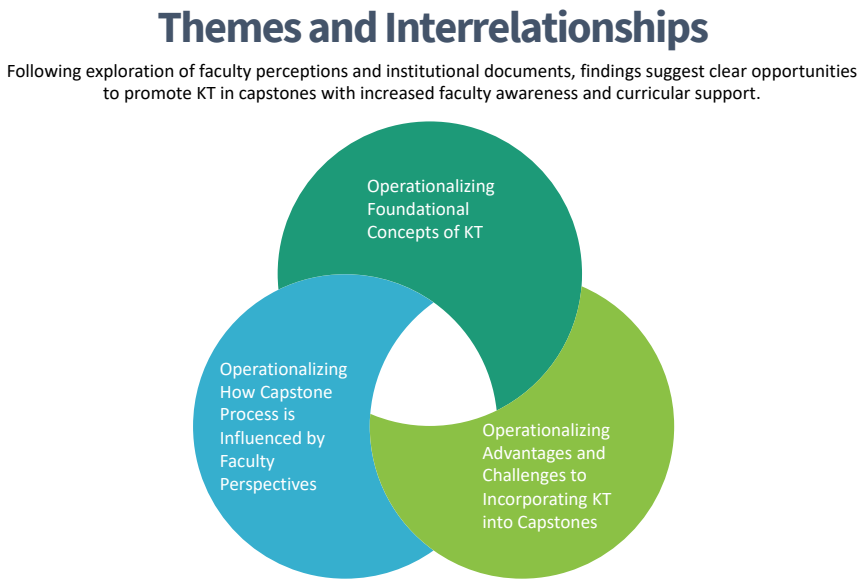
1. How is knowledge translation (KT) reflected in entry-level doctor of occupational therapy (OTD) capstones?
2. How can KT be promoted in entry-level OTD capstones?
    a. How are capstones shaped by faculty perspectives?

Twelve participants were interviewed, and 10 capstone documents were analyzed for this study. Participants represented both public and private universities from every region in the country. Participants' experience in academia ranged from 1 to 30 years. The capstones were from two different universities and were completed between 2014 and 2020. These two universities were the only ones with publicly available web-based capstones, and they represented the Pacific Northwest and Southeast regions of the country. Both universities happened to be private schools.

This chapter presents the key findings obtained from the capstone documents and interviews with OTD faculty. Given the unique nature of this study and the iterative process of qualitative research, the first theme relates to the findings from the capstone documents, while the second and third themes relate to findings from the interviews, with applicable findings from the capstone documents as they relate to those themes. Specifically, promoting KT in capstones entails operationalizing (1) how capstones currently reflect KT concepts, (2) how the capstone process is influenced by faculty perspectives, and (3) what advantages and challenges exist to incorporating KT into

capstones. The first theme illustrates how KT was reflected in the capstone documents as well as what was not reflected in the capstones. Theme 2 describes how the capstone process is influenced by faculty perspectives, including values and constraints. Theme 3 reveals faculty understanding of KT and the advantages and challenges to using KT in capstones. Figure 4.1 presents a graphic representation of interrelationships among three study themes.

Figure 4.1
Interrelationships Among Study Themes



Tables 4.1 to 4.3 include examples of transcript text, initial codes, emergent codes, and themes. Additionally, analytic memos are included to help illustrate my reasoning. Using NVivo software, I also completed word-count queries, code comparisons, matrices, and cross-tabs to help analyze codes, merge codes when appropriate, and identify themes. This process helped me identify relationships within

and across codes, which then began to illustrate the themes and relationships among themes.

During analysis, relationships emerged among the themes that helped clarify the main finding. The overarching finding suggests opportunities to promote KT in capstones with increased faculty awareness and curricular support. Promotion of KT in capstones could offer a systematic way to translate research to practice while also increasing research and the innovative capacity of future research practitioners.

In addition to describing each of the three themes in depth, this chapter presents findings as they relate to answering the research questions. Each research question is presented and answered with document and interview findings. The chapter concludes with the overarching finding and a summary.

Theme 1: Operationalizing Foundational Concepts of Knowledge Translation

Using the knowledge-to-action (KTA) framework to deductively code the capstone documents, I was able to answer my first research question: How is KT reflected in entry-level OTD capstones? This framework includes seven constructs: *identifying a problem; adapting knowledge to local context; assessing barriers and facilitators to knowledge use; selecting, tailoring, and implementing interventions; monitoring knowledge use; evaluating outcomes;* and *sustaining knowledge use.* The KTA framework served as the theoretical underpinning of this study. Often a content analysis approach calls for predetermined codes, allowing a more pragmatic approach to analyzing text (Nayar & Stanley, 2014). Predetermined codes based on a theory being examined are often used in health sciences research (Creswell & Creswell, 2018).

The KTA framework consists of two components, knowledge creation and knowledge action. The knowledge creation phase serves to synthesize new knowledge (Graham et al., 2006). For example, primary research studies are synthesized in systematic reviews, which can then be synthesized into practice guidelines. The action phase represents the application of knowledge (Graham et al., 2006). For example, the practice guidelines can be applied to a particular setting. In other words, in the action phase, knowledge has already been synthesized into a tool or something useful but needs to be applied to a setting to begin to effect change. OTD students are not expected to create new knowledge but are expected to apply knowledge to a particular setting; therefore, only the action phase of the framework was relevant in this analysis.

This theme, *operationalizing foundational concepts of KT*, came from the many codes that began from the KTA framework. This finding stems from the content analysis of the capstone documents. Table 4.1 shows an example of how some coding started and evolved to the first theme. As each document was reviewed multiple times, I began to deductively code the text with the seven constructs of the KTA framework.

Table 4.1
Coding Scheme, Theme 1

Transcript Text		Initial Codes from KTA Framework	Emergent Codes	Theme
Capstone 001:	"However, based on the recent literature search, limited evidence-based research exists regarding the effectiveness of reminiscence therapy and its impact on occupational performance for individuals with Alzheimer's disease."	Identifying Problem	Needs Assessment	**Operationalizing Foundational Concepts of KT**
Capstone 002:	"Data collection will be accomplished through semi-structured interviews and observations. Interviews can provide crucial information about individual experiences and how they behave and act within their context. Interviews are useful in obtaining detailed information about personal feelings, perceptions and opinions of their experiences at the center. Observations will include social behavior, such as staff-user and user-user interaction, as well as descriptions of how programs are delivered and its impact on user's social engagement in activities."			
Memo:	Very context specific. This capstone is specifically looking at contextual facilitators and barriers with these stakeholders indicating a thorough needs assessment.			
Capstone 011:	"Feedback from the participants served as a helpful tool during this process in order to create the most efficient tool"	Facilitating Knowledge	Tools Used	
Memo:	This capstone showed good examples of how they assessed facilitators that supported uptake of knowledge.			
Capstone 012:	"Due to the nature of this capstone project, the assessment was conducted by one student in a short time, using available resources and individual interviews with stakeholders from community-based organizations"	Knowledge Barrier	Project Feasibility	
Memo:	This was a common barrier to capstones and the translation of knowledge- project feasibility. Would be interesting to know if these projects could be started earlier? Or adapted in some way to improve feasibility. This has come up in the first 2 interviews as well.			

It was reasonable to expect every capstone to have evidence of *problem identification, adapting knowledge to local context, assessing barriers and facilitators to knowledge use,* and *stakeholder engagement.* These KT concepts are similar to components of a needs assessment in a capstone. The needs assessment encompasses many aspects of KT and is a requirement in the Accreditation Council for Occupational Therapy Education (ACOTE) standards. ACOTE Standard D.1.3 requires a needs assessment for capstone preparation (ACOTE, 2018). Typically embedded in the OTD curriculum is the requirement to conduct a needs assessment (DeIuliis & Bednarski, 2020; Stephenson et al., 2020). This includes any preparatory coursework to support the development of the project, including identifying a problem and creating a scholarly question (DeIuliis & Bednarski, 2020).

Each of the sampled capstones completed a needs assessment which included most of the above-mentioned KT concepts. This was the most prominent reflection of KT

in the capstones during this analysis. Although the components of the needs assessment may not have used the same KT terminology, they did meet the definitions of KT concepts. For example, during the needs assessment, there were literature reviews that helped identify a knowledge gap. There were also observations and interviews with stakeholders throughout the projects, often soliciting feedback regarding adapting the intervention to the local context while assessing facilitators and barriers to their planned intervention. The following subsections illustrate these findings in more detail.

Identifying the Problem

Each document was a completed project from an OTD student, often beginning with a literature review, problem identification, and needs assessment. This became a code labeled *identifying problem.* Identifying the problem or knowledge gap is arguably the most important step in KT, as one first needs to identify a problem deserving of attention. All the capstones had evidence of identifying the problem, which was commonly done through the needs assessment. This was expressed in a variety of ways in the capstones. For example, in Capstone 1, the student wrote, "However, based on the recent literature search, limited evidence-based research exists regarding the effectiveness of reminiscence therapy and its impact on occupational performance for individuals with Alzheimer's disease." In another capstone, the OTD student noted, "There is also insufficient literature, if any at all, that addresses the effect an occupational therapy presence has on the camp experience for children with disabilities" (Capstone 14). Lastly, Capstone 2 provided an example of identifying the problem in a capstone:

> There is increasing evidence of the role of occupational therapists in facilitating healthy aging in community-dwelling older adults. However, there is lack of

> evidence that identifies the unique contribution of occupational therapy in promoting social participation among older adults in senior centers.

Adapting Knowledge

This code from the KTA framework helped to operationalize the process used by the capstone projects to adapt the knowledge to the local context. Adaptation could include how decisions were made regarding the value and usefulness of the knowledge in a particular setting and the activities involved in tailoring the knowledge to a setting (Graham et al., 2006). I was most interested in how the knowledge was being adapted, including the types of messages and activities used. How knowledge is adapted matters, as it is the mechanism that occurs when decisions about the knowledge's meaning, utility, and appropriateness are made (Graham et al., 2006).

Most capstones had evidence of adapting knowledge to the local context. Adapting knowledge was reflected in various ways, including discussions with stakeholders about the usefulness and value and the activities used for adaptation. For example, in Capstone 9, a student was able to adapt the project after discussions about what might be more valuable: "After discussions with the site supervisor and hearing of perceived initial interest in participating in a pilot occupational therapy project, we decided to change our main focus."

One capstone reflected knowledge adaptation by addressing specific needs of the population at the site:

> Developing and implementing new programming which focuses on occupation-based, task-oriented, procedural memory activities which are connected to the participants' interests and pasts, would be beneficial to effectively combining occupational therapy with reminiscence, as it relates to the Alzheimer's disease and dementia population. (Capstone 1)

After conducting a needs assessment, one capstone adapted the project scope after realizing it benefited multiple stakeholders. “The focus of the initial project was geared more towards residents. . . . The needs assessment made it clear that while it was beneficial to share this with patients, there was a huge need to advocate for this role with clinicians as well” (Capstone 1).

Assessing Barriers and Facilitators

Other codes in this theme included assessment of KT facilitators and barriers that may enhance or impede knowledge uptake. Most capstones illustrated evidence of assessing knowledge facilitators and barriers. Knowledge facilitators were identified through a variety of methods, such as checklists, discussions, observations, and interviews. Capstone 7 illustrated the use of checklists as a structured format to assess facilitation of an intervention: “The checklist provided a structured format for observing service delivery and the attention paid to the areas of preventive care, shared decision-making, advocacy, verifying patient understanding, and providing support through the form of empathy, validation or relatability.” Capstone 12 assessed knowledge facilitation through communication and meetings with stakeholders: “Propose a unified mission statement and vision inclusive of all parties. . . . Meetings with involved faculty were held as the SOP evolved to discuss objectives, policies, and procedures, and how to best capture their needs in the document.” Other capstones used observations and interviews to facilitate KT among stakeholders: “This observation period yielded a level of connection between the student researcher and the participants by allowing the student researcher to better understand the participants’ experiences with non-contact boxing” (Capstone 13) and “Staff, seniors, and long-term volunteers were interviewed for this

project . . . because they showed good understanding of how the senior center functioned and had good relationships" (Capstone 2).

Knowledge barriers included specific examples of barriers the capstone may have encountered. These included a variety of barriers such as time and resources and institutional regulations. Capstone 11 described how not having the correct equipment needed for a specific intervention was a barrier: "Despite the facility being fully equipped with antigravity treadmills, two therapy pools, and other resources to address chronic pain, the common practice mostly focused on the acute pain at hand." Other barriers included lack of transportation and limited hours, as described by Capstone 12: "There was no transportation provided for clients, which is a known barrier to keeping appointments. . . . Clinic was offered during normal business hours . . . [which] also limited the participation of community members who were unable to take time off from work." Capstone 15 described a barrier outside of their control such as reimbursement: "Third-party payers only reimburse caregiver training services when they are carried out in the immediate presence of the patient." Finally, Capstone 2 explained a KT barrier due to organizational policies: "According to the organization's policy, big social events and lunch activities usually requires about 3 months to prepare and plan for, therefore only simple recommendations were actually implemented during this project." Nearly all the capstones had evidence of recognizing and assessing knowledge barriers. See Table 4.1 for the coding scheme.

Although stakeholder engagement as a KT construct is not explicitly illustrated in the KTA application cycle, it is discussed throughout the KT literature as an essential construct and thus became a code during analysis. Graham et al. (2006) identified

stakeholders in the broad sense as both knowledge producers and knowledge users. A majority of the capstones reflected stakeholder engagement throughout the capstone project phases, from planning and producing to using knowledge. These stakeholders were identified in a variety of roles such as practitioners, clients, caregivers, and administrators. Two capstones explained how stakeholders were recognized and interviewed because of the perspective they bring. Capstone 2 stated, "Volunteers were also interviewed because they showed good understanding of how the senior center functioned and had good relationships with the seniors." Capstone 7 referred to interviewing occupational therapists and physical therapists with queries of "why service providers have focused on women's health."

Stakeholder engagement was reflected in Capstone 9, as stakeholders were asked for input about the intervention: "Team members were asked to note ways clients incorporated the ADAPT Advanced 5 fundamentals of movement into each session, and how each trainer approached clients differently." Capstone 11 described how they engaged stakeholders by asking for feedback: "Participants were asked if the role of OT was clearly explained in relation to chronic pain management, if there was any further information they would have wanted to know, and for their feedback, comments, and concerns."

Selecting, Tailoring, and Implementing Interventions

The next phase in the knowledge application cycle of the KTA framework involves implementing knowledge by selecting and tailoring interventions while recognizing the identified barriers and facilitators (Graham et al., 2006). The final step in a capstone is to disseminate the results (DeIuliis & Bednarski, 2020). Graham et al.

(2006) differentiated implementation and dissemination terminology. Specifically, Graham and colleagues (2006) recognized implementation as a systematic approach to facilitate adoption of the knowledge or intervention, while dissemination involves tailoring a specific message to a specific audience. Diffusion involves a passive effort to share information, such as publishing information in a journal or website or leaving a brochure (Graham et al., 2006; Straus et al., 2013). The codes (implementation, dissemination, diffusion) in this study followed the terminology stated by Graham and colleagues. For example, while implementation is the systematic approach to aid in intervention adoption at the capstone site, dissemination is the way students distributed the capstone project findings to their stakeholders. These stakeholders could include peers, mentors, clients, and faculty. Dissemination also included how students presented their project results, such as a research symposium, poster, or video presentation, typically at their university. This is a curriculum requirement. Diffusion, according to Graham et al. (2006), is a passive, often unplanned attempt, such as a student leaving a binder of information at the site with little education or training at the site. Implementation was the initial code and then was analyzed further, generating emergent subcodes including dissemination and diffusion.

Two out of 10 capstones described implementation strategies that were considered systematic, including informational sessions tailored to the clients, adaptation of materials, and trainings for various staff, indicating an active and systematic approach to implement knowledge at the site. The remaining eight capstones did not illustrate an active or systematic approach to implementing knowledge but did have evidence of more passive forms of implementation, including dissemination and diffusion, as a result of

their program or assignment requirements. Dissemination is also a requirement established by ACOTE Standard D.1.8, which requires completion and dissemination of the capstone project (ACOTE, 2018). These sampled capstones were disseminated at their university, often inviting community partners or stakeholders, family, and friends. This was described in the capstone as a requirement of the university.

Capstone 11 used an active approach to implement the intervention, using informational sessions designed for the specific stakeholders or knowledge users at specific intervals throughout the project. The student also addressed potential barriers, again indicating more of an active implementation of the intervention. Specifically:

> Between weeks eight and thirteen, four informational sessions were provided to the patients, students, therapy staff, and nursing staff members. . . . All of these connections made it possible to accurately target the correct populations . . . the informational sessions to assure adequate attendance to each session by planning them during already existing meetings or in-service dates.

Capstone 9 described how creating a specific program for the client based on an evaluation as well as working with the client individually "created an individualized home program at ADAPT Advanced, as well as worked one-on-one with another client at his workplace and provided recommendations based on a workplace ergonomic evaluation."

Capstone 13 described disseminating project results to stakeholders: "The student researcher disseminated in April by presenting a PowerPoint and video presentation to the staff, coaches, and participants of RS Boxing. . . . Presentation included information on the capstone project and experience, methods and results of the research." Finally, Capstone 2 described diffusing the intervention using a binder given to the site: "A binder filled with key findings from this project, including a final draft of lunch activities, will

be presented to the senior center staff, prior to disseminating a poster presentation at University."

Knowledge Translation Concepts Minimally Reflected in Capstones

The remaining concepts of KT include *sustaining knowledge use, evaluating outcomes,* and *monitoring knowledge use*. These concepts were minimally represented in this sample of capstones. *Sustaining knowledge* was evident in one capstone, and three capstones discussed a plan for sustainability. *Sustaining knowledge* is the last phase of the action cycle in the KTA framework. This phase initiates a feedback loop through the other action phases, allowing an opportunity to evaluate the effect of initial knowledge use and how it can be sustained (Graham et al., 2006). In other words, this phase should assess barriers to sustaining the knowledge, adapt as needed, and monitor and evaluate knowledge use sustainability (Graham et al., 2006). For example, Capstone 14 described retaining OT at the site as a way for *sustaining knowledge* or intervention at the site: "An occupational therapy presence through XXX University's OTD program will remain at camp which gives XX CAMP an opportunity to continue providing OT services at camp without additional cost which can be prohibitive for a not-for-profit organization." Two other capstones described how they recognized sustainability and recommended how to sustain the knowledge: "One of the most important steps to operating a sustainable clinic is ensuring the mission of the program aligns with that of the university" (Capstone 12); "If there can be education and advocacy for students, it can be assumed that they can then take this knowledge into practice when they go" (Capstone 11).

Three of the 10 capstones demonstrated a mechanism to evaluate knowledge outcomes. This phase in the KTA action cycle evaluates whether or not the knowledge, or

intervention, had an impact—in other words, whether the knowledge made a difference at the capstone site. For instance, Capstone 11, the same capstone that described a systematic implementation of the intervention, also described using an online form to gather feedback and ultimately adapt the manual: "After the final session was completed in week 15, overall feedback, comments, and concerns were gathered from the Google Form. Any suggestions, comments, or concerns made were utilized when making final edits to the manual." Although the remaining two capstones did not describe a systematic implementation, they did offer approaches to evaluating the outcomes of their project. For example, Capstone 14 used a self-report document for clients to document their experience: "Impact of the sensory tent on camper experience was measured through a self-report style log that campers were asked to complete when entering and leaving the tent." Capstone 15 used a follow-up survey to evaluate outcomes: "A follow-up questionnaire . . . was developed to determine if positive outcomes were reached."

One KTA framework phase not evident in the sampled capstones was *monitoring knowledge use*. It is important to track how and to what extent knowledge is being used. *Monitoring knowledge use* assesses how and to what degree the information was distributed in the potential adopter population (Graham et al., 2006). Although knowledge application is essential, the effect of knowledge application on stakeholders and system outcomes is of particular interest (Straus et al., 2013). This phase happens after the knowledge, or intervention, is implemented.

Theme 1 Summary

Overall, every capstone sampled reflected at least some foundational KT concepts, which answers the first research question and also begins to suggest how KT

can be promoted in capstones. KT was reflected in these capstones in a few ways including *identifying a problem, adapting knowledge to the local context, assessing barriers and facilitators to knowledge use,* and *stakeholder engagement.* Problem identification was reflected through comprehensive literature reviews and creating a scholarly question in an area of focus. Additionally, most capstones reflected KT through adapting the knowledge to local contexts. This was illustrated in a variety of ways, including adapting the message and adapting the activity to help translate the knowledge. Assessment of knowledge facilitators and barriers was evident in most capstones and included a variety of methods such as observations and interviews. Recognition and engagement of stakeholders was evident in all the capstones, and most seemed to represent diverse roles. Although these concepts of KT were reflected in these capstones, there was a paucity of material reflecting concepts of *selecting and implementing interventions, evaluating knowledge outcomes, sustaining knowledge use,* and *monitoring knowledge use*.

Theme 2: Operationalizing How the Capstone Process Is Influenced by Faculty Perspectives: Values and Constraints

This theme resulted from mostly inductive coding while analyzing interview transcripts and helps to answer the second research question: *How can KT be promoted in entry-level OTD capstones?* Additionally*,* this theme also answers, from the faculty's perspective, the first research question: *How is KT reflected in entry-level OTD capstones?* Because qualitative research is iterative, after careful analysis and discussion with committee members, these findings provide additional insight and answer a sub-

question related to the second question: *How are capstones shaped by faculty perspectives*?

Within this theme, most faculty members discussed their perspectives about the capstone, including the purpose of the capstone and their expectations for it. Participants also discussed the various values and constraints within the curriculum and the capstone, specifically how the new accreditation standard changes affected their curriculum. Changes in accreditation standards have a significant impact on educational curriculum, which can impact practice changes. This is an example of a complex system that consists of various interconnected factors. Complex systems cannot be completely understood by looking at their individual components because the interactions between them, as well as the effects of those interactions, are equally important (Bleakley & Cleland, 2015).

This theme, along with subthemes, helps to elucidate the complex nature of the faculty perspectives and how they influence the curriculum and capstone process, including how KT is reflected and could be promoted in the capstones. The following sections begin to construct the overall finding that with increased faculty understanding and curricular support, there is increased opportunity to promote KT in capstones. Table 4.2 illustrates an example of a coding scheme for Theme 2.

Table 4.2
Coding Scheme Example, Theme 2

Transcript Text		Emergent Codes	Theme
Participant 010:	"…each student project is unique, and capstone is a series of courses and experiences that come together to yield deliverable outcomes."	Culminating experience	**Operationalizing How the Capstone Process is Influenced by Faculty Perspectives: Values and Constraints**
Participant 008:	"So our doctoral capstone experience is a culminating experience in which the students are able to gain more in-depth skills in a particular focus area that aligns with the ACOTE focus areas, whether that's administration, leadership, program development, advanced clinical skills, theory development or policy… should meet a need of the site and align with those focus areas."		
Memo:	All seemed to be confident in the expectation for a culminating project. Also how defined in ACOTE standard.		
Participant 011:	"I encourage them to present their capstone at conference state and nationally and every year a couple do"	Dissemination expectation	
Memo:	While not a requirement, dissemination was encouraged. Could be a good place to start to promote KT. If required, would there be increase? Would it affect the quality? Would there be more implementation?		
Participant 004:	"One of our biggest challenges we have such outstanding, motivated students that they get so inspired. Sometimes they think too big. We have to kind of bring it down to reality."	Barriers to implementation	
Participant 007:	I think two things…some of the students want us to simply develop and assign them a capstone…The other challenge is I think there are many instances where students want to do something in practice, but we get the response from clinicians 'we can't do it, we're too busy, we're taking level one students, we're taking students to shadow, we took level two students and now you want us to take capstone student'…I think people are exhausted. No, they don't see it that this could help them, they see it as more work….		
Memo:	Feasibility and time seem to be the major constraints to implementation. DNP literature describes importance of implementation even with tight timelines as that is more representative of real-world. Students have ability to engage in problem solving and build confidence, resiliency and self-efficacy.		

Purpose and Expectations of Capstones

The general purpose of the capstone is to give students in-depth exposure to a specific subject area (ACOTE, 2018; DeIuliis & Bednarski, 2020). According to ACOTE (2018), the doctoral capstone "shall be an integral part of the program's curriculum design, and shall include an in-depth experience in one or more of the following: clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, or theory development" (p. 43). In other words, capstones provide opportunities for students to advance skills in a focus area, synthesizing and applying knowledge gained through the curriculum (ACOTE, 2018; DeIuliis & Bednarski, 2020; Stephenson et al., 2020). Although this is an educational requirement for all OTD programs, each program achieves this aim in its own way, depending on its curricular mission and philosophy. For example, some programs encourage capstone experiences in nontraditional settings while others do not.

During the interviews, faculty were asked to describe the capstone's purpose and their expectations of the capstone. Most participants described the capstone's purpose as a culminating experience, a means to increase reach in communities, and an opportunity to increase student efficacy and research capacity. Additionally, all participants described their expectation for the capstone to be implemented at the site and disseminated to stakeholders.

Capstone as a Culminating Experience. The capstone project has been described as a culminating project in which the student shows synthesis and translation of information acquired in the focused field of research (ACOTE, 2018). Participant 10 described the capstone as the place where courses and experiences join to produce results: "Each student project is unique, and capstone is a series of courses and experiences that come together to yield deliverable outcomes." Participant 8 discussed their perspective of the capstone as a culminating experience and how it aligns with the ACOTE standard:

> So our doctoral capstone experience is a culminating experience in which the students are able to gain more in-depth skills in a particular focus area that aligns with the ACOTE focus areas, whether that's administration, leadership, program development, advanced clinical skills, theory development or policy. . . . [It] should meet a need of the site and align with those focus areas.

Participant 4 described it as a means for the student to go beyond being a general practitioner: "Obviously it is a culminating experience for students that goes above and beyond the generalist's level. . . . Look at it as an area of going above and beyond, and really culminating all the experiences throughout the curriculum." This participant also discussed how the new ACOTE standards influenced the creation of a procedure manual to ensure alignment of curriculum and standards: "One of the things we did this year with

the new standards is write a very formalized capstone policy and procedure [manual]. We wanted to show how we threaded throughout the curriculum all the different segments of capstone" (Participant 4). Participant 12 also discussed how the capstone was threaded throughout the curriculum: "The thing about capstone experience is that it is not just plopped at the end of your semester; it is actually entwined with our curriculum design." Capstone preparation occurred throughout the curriculum, as stated by Participant 6: "The expectation is that it's related to the capstone experience. . . . We encourage them to do things throughout their curriculum that . . . connect that back to the capstone, just to gather as much knowledge and expertise and familiarity with the site as possible."

Increasing Reach of Occupational Therapy in the Community.

When asked about the general expectations of the capstone, most participants discussed the capstone as an opportunity to increase reach in the community and demonstrate the value of OT. "There's a lot of opportunity out there to be able to really show the value of occupational therapy and how important it can be for individuals and clients" (Participant 2). One participant was able to describe the opportunity for the capstone to give back to the site: "It's sort of like our time to give back because the student is really high level, and they can do nonclinical things and they can do this project to give something back to the site" (Participant 3).

One participant was able to describe the unique opportunities and influences these projects have on students as well as institutions. This was an opportunity to influence further growth for the student, encouraging creativity and innovation while translating knowledge throughout their careers:

> I also see . . . the capstone as an opportunity to really encourage the students to engage in these sorts of activities long after they've graduated from school, right.

> So that they're better able when they are practitioners . . . to assess, what are the needs . . . and how [they] bring in the relevant literature evidence to help address these needs. [Students should think:] How can I make it sustainable? And so my hope is that it's not just about the content, but also the process, and that they are better able to kind of tackle situations that may arise in their careers and make an impact in that way. (Participant 9)

Increasing Student Self-Efficacy and Research Capacity. In addition to increasing reach, most participants described using the capstone as a means to increase student self-efficacy, specifically advancing communication and problem-solving skills, increasing doctoral-level thinking and research capacity. Participant 9 described the importance of connecting with stakeholders to increase student skills in communication and also advocate for the value of OT:

> They did kind of program development within an organization that did not have an OT on staff. . . . And so they were able to talk with staff more broadly about just kind of educating them about this topic and what are some things that potentially they could be doing as an organization to better support their clients.

Participant 4 discussed using the current pandemic as a way to problem-solve and adapt to an emerging situation while building student efficacy, "Our COVID students this summer said they feel that actually COVID had helped their project go to much higher and in-depth level, as a result of, uh, redesigning their project. . . . It really helped them become better problem-solvers." Increasing student efficacy also included problem-solving and communication with stakeholders. When asked about how they prepare students for capstone, during a follow-up interview Participant 3 stated, "Push the students to find a site before we do the course on the planning with the needs assessments so that they can learn how to do an actual needs assessment with multiple stakeholders."

Faculty described how they supported students and used the capstone as a means to move to a doctoral level, greater than a clinical rotation. The faculty seemed to

influence their students to be self-directed and resilient enough to complete these projects. This was described by half of the participants when asked about their expectation for the learner. Participant 2 indicated that the purpose of the capstone was to be beyond being an entry-level competent clinician and encouraged students to use the capstone as an opportunity to take their learning to a higher level: "So tell me what's doctoral about that? And that's a question I often ask . . . because at the end of that rotation, you're gonna be entry-level competent. . . . How do you make that doctoral?" Participant 3 explained the expectation of completing a doctoral-level project: "One thing that is I think pretty significant for all sites is that it does need to be a self-directed project and capstone by the student, right, because we're expecting them to do doctoral level."

Faculty also expected the capstone to facilitate increased research capacity. All of the participants described the various ways in which students built their research capacity, including the importance of scholarship, finding meaning in research, and being a steward of evidence. "I think some key elements are it being within some sort of scholarship. And we use Boyers. . . . So scholarship of discovery, application . . . so it should kind of reflect some scholarship . . . and really indicate like a synthesis of learning" (Participant 9). Another participant described the importance of students finding meaning in their research: "Find meaning and if we don't find meaning . . . you're thinking . . . gee, I wonder . . . if what I'm doing is really effective. How would you go about doing, engaging in that research? . . . So I said, these are the questions. You're doing research" (Participant 7). Participant 4 explained how students grow to appreciate research: "When the students come in their course, they hate research, but when they come out, they said they actually love it and understand it and they want to contribute to it." Another participant commented

that faculty had an influence on students to be not only clinicians, but researchers: “Start with . . . those individuals that are so used to being in training, like train them yes to be OTs, but also train them to be stewards of evidence” (Participant 1).

Capstone Implementation and Dissemination Expectations and Barriers

Implementation and dissemination terminology can be confusing, and there are a variety of interpretations in the literature. For this study, I chose to code the terms separately and used the definitions of Graham and colleagues (2006). Implementation was defined by Graham et al. (2006) as a “systematic effort to encourage adoption” (p. 21) of an intervention or knowledge. In other words, implementation offers an organized way to incorporate information or actions within specific environments and to modify norms of practices. This includes how a capstone project was implemented at a particular site and whether it promoted change. According to Graham and colleagues (2006), dissemination is how the message is tailored and targeted to a particular audience. Examples include presenting capstone findings to stakeholders such as faculty, mentors, and site personnel.

When asked about how capstones are disseminated and implemented, every participant discussed their expectations and the variety of ways in which dissemination occurs, such as poster presentations, PowerPoint, web-based platforms, written documents, or some combination of them. Participant 1 described capstone dissemination as a mix of posters and written documents to meet their curriculum requirement:

> The way we disseminate is through poster presentations. . . . Site mentors were invited to come. . . . That is how we check off that dissemination box. So it’s the poster on top of the, their main document. It consists of the systematic scoping review that they would have completed the summer prior to them leaving for their capstone experience. (Participant 1)

Others also described dissemination via poster presentation: “For dissemination is that the students are developing a poster of their project, . . . present that poster live, whether that’s in person or through like an online event that there’s public access to for the community” (Participant 10). Although presenting the capstone at a conference was not a requirement, most participants encouraged their students to do so, but only a couple seemed to follow through with it. “I encourage them to present their capstone at conference state and nationally and every year a couple do” (Participant 11). One program initiated a new way to disseminate capstones by using an online platform called Udemy. “We’re hoping that at some point in time we could take the Udemy, people could watch it . . . and then they could get CEU credit” (Participant 5).

Although various dissemination strategies were discussed by all participants, most participants discussed barriers to implementation rather than implementation expectations. Only three participants discussed implementation expectations of the capstones. For example, Participant 8 described an expectation to implement the capstone:

> So they have to implement whatever project they planned. They’re expected to implement their projects and evaluate the outcome. So all of that preparation for deciding what their evaluation measures will be comes in the spring during their coursework, before the capstone. So they’re working very closely with faculty to figure out what makes the most sense setting for their project. . . . None of it has been hypothetical.

While OTD students were expected to implement an intervention, if it did not happen, there should be an implementation plan. One participant said, “If you’re not able to implement [an intervention], you write up an implementation analysis” (Participant 1).

Ten out of 12 participants discussed a variety of barriers to intervention implementation, which included project feasibility, decreased student awareness regarding the project scope, organizational barriers, the current COVID situation, or a

combination of barriers. Two participants described the feasibility of the intervention as a barrier to implementation:

> I think sometimes that is something that they realized during the implementation phase of the doctoral capstone experience and project, where things will come off the more unexpected end. I wonder if we could have the students think through some of the potential barriers ahead of time and come up with some solutions: If this happens, then what? (Participant 8)

> One of our biggest challenges, we have such outstanding, motivated students that they get so inspired. Sometimes they think too big. We have to kind of bring it down to reality. (Participant 4).

One participant described the capstone as overwhelming for some students: "We piled all these requirements in two semesters and it just was a lot and the students couldn't really wrap their head around it" (Participant 6).

Other participants discussed the students' decreased awareness regarding the scope of the project. "But students might say . . . by the end of the rotation, they'll complete five evaluations. . . . I would hope that you might do that in a week or less . . . just not really having an awareness of like what actual practice is" (Participant 2). When asked about barriers to implementation, Participant 7 described two concerns, lack of confidence in the student and lack of buy-in from clinical sites.

> I think two things. . . . Some of the students want us to simply develop and assign them a capstone. . . . The other challenge is I think there are many instances where students want to do something in practice, but we get the response from clinicians: "We can't do it; we're too busy. We're taking level one students, we're taking students to shadow, we took level two students, and now you want us to take capstone student." . . . I think people are exhausted. No, they don't see it that this could help them; they see it as more work.

Participant 10 described various community organizational barriers to implementation, such as primary school settings and hospital settings:

> School-based communication with the OTs there, or maybe even administrators or teachers there, it's very difficult and especially even when it becomes over break times and then summers. . . . When it comes to hospitals, there's more challenges because, you know, I have to make sure that they understand that this is not a level two rotation.

However, Participant 9 was able to describe how community-based nonprofit organizations welcomed students: "I see greater success in community-based areas like . . . Big Brother, Big Sister programs, things like that. Like, YWCA. . . . They're my . . . most consistent sites where they're like: Oh, yeah, we'll take a student of course."

Other participants discussed the recent challenges brought forth by the pandemic. "Especially now with COVID, clinicians and practitioners and people in the community are just saying to us: We're still trying to get ourselves back and we can't do this" (Participant 7). "We've had plenty of sites with COVID, you know, shut down. So if something would happen, one site shuts down, how would you address that" (Participant 8). Despite the barriers to implementation, the faculty were able to describe the many opportunities afforded to the students because of the capstone experience.

Capstone Curriculum Changes

At least two ACOTE (2018) standard changes influenced capstone curriculum changes: Standard B.6.1, that students will "design and implement a scholarly study that aligns with current research priorities and advances KT, professional practice, service delivery, or professional issues (e.g., Scholarship of Integration, Scholarship of Application, Scholarship of Teaching and Learning)" (p. 36), and Standard D.1.3, that "preparation for the capstone project includes a literature review, needs assessment, goals/objectives, and an evaluation plan. Preparation should align with the curriculum

design and sequence and is completed prior to the commencement of the 14-week doctoral capstone experience" (p. 45).

Standard B.6.1 was a revised standard, which added "advances knowledge translation" to the scholarly study requirement. Although ACOTE standards did not specifically explain what this means, a recent publication from DeIuliis and Bednarski (2020) discussed foundational aspects of KT as related to capstone projects. For example, they briefly discussed KT as a concept to help close the gap between the student's capstone findings and OT practice once the capstone is implemented at the site.

The D standards, in general, explain the minimum standards for capstone curricula (DeIuliis & Bednarski, 2020). Standard D.1.3 is new as of 2018 and requires the needs assessment to be completed before the student goes to the capstone site. This standard also requires goals and objectives and a plan for evaluation of the capstone project. This could be similar to a capstone project proposal (DeIuliis & Bednarski, 2020). In the recent past, the needs assessment could be completed on site during the capstone experience, which left little time for implementation of an intervention.

Every participant recognized how the recent educational standard revision influenced curriculum changes. For example, Participant 9 stated, "With the new ACOTE guidelines. . . when those went into effect over this past summer, . . . I've been working on kind of revising our capstone manual and really looking at what the project does entail." Some of these changes included adding or revising research courses, as explained by Participant 7: "So we've just revised our curriculum, . . . research series where the faculty mentor students through research projects from idea to proposal to IRB to

enacting it to disseminating it." Each program was in a different stage of curriculum change, depending on when they initiated the change in standards.

When participants were asked about how they incorporate the D standard into the capstone, all responded about their curriculum changes affecting the capstone. In the recent past, the ACOTE standard did not specify when the needs assessment needed to be completed, as stated by Participant 3: "The old standards, which we're now switching away from, . . . people are still transitioning cohort to cohort. . . . Initial standards didn't really require all the planning to be done before you got on site. It's one of the bigger changes." With some programs, these changes will not be noticeable for a few years, as stated by Participant 6:

> We are currently in a curriculum change. They've been doing it [needs assessment] in the seventh and eighth semester. We felt that was really too late. . . . All of our curriculum changes are being implemented with our new cohort that just started. And so it'll be 3 years . . . before we really see it all panning out.

Participant 6 was also able to provide insight from the students about this recent change: "The feedback we've gotten from students as well is that the needs . . . assessment felt too late." Additionally, this standard change required redesigning entire courses for some OTD programs, as identified by Participant 3: "I'm redesigning everything with the new standards. And I've redesigned the first [research] course and now I'm in the process of redesigning the next two courses so that, you know, we can build these kinds of things in."

Theme 2 Summary

Theme 2, along with its subthemes, illustrated the dynamic complexities of the faculty's expectations, as well as how they affected the curriculum and the process of

capstones. This theme also helped to construct the overall finding that with increased faculty understanding and curricular support, there is increased opportunity to promote KT in capstones. Despite the curriculum changes, faculty seemed to be adapting and had high expectations from their students in regards to the capstone. The capstone provided an abundance of opportunity to increase the reach of OT and demonstrate the value of OT while facilitating student efficacy and creativity in a culminating project. These findings suggest opportunities to promote KT in OTD capstones.

Theme 3: Operationalizing Advantages and Challenges to Incorporating Knowledge Translation into Capstones

Although KT has been discussed in the literature for decades, there is still some confusion about the terminology. Recent revisions in ACOTE (2018) educational Standard B.6.1 suggest scholarly studies to "advance knowledge translation" (p. 36). According to the Canadian Institutes of Health Research CIHR (2016), KT is "the exchange, synthesis and ethically-sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of research" (para. 4). This theme presents findings related to faculty understanding of KT and the perceived advantages and challenges to incorporating KT into capstones, answering Research Question 2, *How can KT be promoted in entry-level OTD capstones?* Table 4.3 illustrates a coding scheme example for Theme 3.

Table 4.3
Coding Scheme Example, Theme 3

	Transcript Text	Emergent Codes	Theme
Follow-up to Interview 002:	""I think it gives a really good framework, like it shows the students how it happens."	Perceived Advantages to Incorporating KT	Operationalizing Advantages and Challenges to Incorporating KT into Capstones
Follow-up to Interview 005:	"I like this.....I'm not familiar with Graham's diagram here. But I must say, I do like it because it really it gives a kind of a frame for what what we're doing...everything is so contextual...it's contextual from the perspective of the student. It's contextual...what the sites needs are and and that sometimes changes, too."		
Follow-up to Interview 006:	"I think it would help them I think it'd help them to visualize it more... the framework could help the students. But I think it could also help the capstone coordinator work visualizing the process as well."		
Participant 003:	"...do that needs assessment earlier ... then when they get on site if something has changed a year later...How can we tweak this program to make it meet your needs now so they don't have to start over?"	Perceived Challenges to Incorporating KT	
Participant 005:	"the sites needs sometimes change...which would also be a challenge because when we set these up a year in advance and I mean we have to do that."		
Participant 009:	"I think where maybe we fall short a little bit is monitoring knowledge used in evaluating outcomes and sustaining knowledge...We only have 14 weeks on site, whatever that kind of means for their project...but, you know, I don't think we have a real in-depth way that students kind of do that piece of it..."		
Memo:	After discussion with committee members it was determined a f/u interview was necessary with the first few interviews to show them the KTA framework and additional questions about their perception of using the framework and how they may incorporate KT into their curriculum. Once the faculty had a visual of the framework, there was greater understanding and perceived benefits and challenges to using it. They were able to make the connections and provide examples of how KT is reflected in their capstone curriculum already and the areas in which they could improve.		
Follow-up Interview Participant 002:	"Definitely adapt knowledge to local context through a needs assessment, we really hit that hard because that's a requirement within the ACOTE standards."	Perceived Understanding of KT	Operationalizing Advantages and Challenges to Incorporating KT into Capstones
Follow-up Interview Participant 008:	"Students start off with the needs assessment, so they're identifying a problem at the site and complete a literature review. So I'm thinking that's the adapt knowledge to local context piece of things. I think that all kind of comes with a needs assessment, so they're talking with the site and figuring out and what's feasible what can and can't be done."		
Participant 002:	"the sustaining knowledge use I would say is utilized in keeping a repository of all those projects and then they're available for students as well as clinicians to access for future projects."	Perceived Misunderstanding of KT	
Participant 008:	"That I don't know. I mean, you know, I think a term that we use is probably evidence-based practice and I don't know if maybe that relates to knowledge translation."		
Memo:	After discussion with committee members, it was determined a f/u interview was necessary with the first few interviews to show them the KTA framework and added questions about their perception of using the framework and how they may incorporate this into their curriculum. Once the faculty had a visual of the framework, they was greater understanding and perceived benefits to using it. They were able to make the connections.		

Faculty Understanding of Knowledge Translation

When participants were asked what they knew about KT, there were varied responses about the definition of KT and how it is used in practice and research, suggesting various degrees of understanding. Additionally, the first four interviews did not include a visual example of the KTA framework, but interview questions included how participants understood KT and if they used it in capstones. After reassessment of the situation and discussion with committee members, the KTA framework was shown to participants with questions about elements of the framework represented in capstones. To

maintain trustworthiness and consistency, follow-up interviews with those not initially shown the framework were completed. This allowed richer interviews with participants in regards to their perspectives of KT and the framework.

Defining Knowledge Translation

Before being introduced to the KTA framework, participants described how they defined KT. Responses included a discrepancy in terminology and a general belief that KT was just evidence-based practice. For example, Participant 1 stated, "I often use the terms *knowledge translation, implementation science* synonymously, . . . even though I'm sure that depends on . . . different schools of thought on that." Participant 5 believed that the program discussed the concept but did not use the terminology: "We talk about it, but not in using a *knowledge translation*, you know, phraseology or nomenclature in the intervention courses." Participant 10 admitted to not knowing the true definition: "I wouldn't say that I know the true concept of the definition, probably where you [are] coming from. I may have a little bit more of a lay term." Another participant viewed it as the same as evidence-based practice: "That I don't know. I mean, you know, I think a term that we use is probably evidence-based practice, and I don't know if maybe that relates to knowledge translation" (Participant 8). Participant 4 defined KT as "knowledge translation obviously is whatever we learn we need to be able to share with others and continue not only to share with individuals, but certainly with the profession and with the greater body of knowledge for others." When asked how they defined and used KT, Participant 3 was able to articulate a basic understanding and provide an example: "I teach the students [that] . . . you want to be able to take something you've learned and

you have evidence against it and you want to make it, so we can use it [in] everyday practice."

Confusion Regarding Knowledge Translation Concepts Reflected in Capstones

When asked if KT was taught in their program and how it was connected to the capstone, participants responded with answers regarding understanding various constructs of KT. While just over half the participants had a basic understanding of KT, they still had decreased understanding of how it could be used in the capstones. For example, in KT, outcomes must be fully evaluated to determine the impact of knowledge use (Graham et al., 2006). When Participant 2 was asked about evaluation of outcomes in a capstone project, the reply was that student outcomes were evaluated but not intervention outcomes: "In evaluating the outcomes, I don't know that, I mean, we as faculty evaluate outcomes." However, Participant 2 did say if students implement a program, then they should implement an evaluation; however, it was not a specific requirement.

In regards to the KT concept of sustaining knowledge use, one participant seemed to have a misunderstanding of the meaning. According to Graham et al. (Graham et al., 2006), *sustaining knowledge use* pertains to the continuation of the intervention or knowledge in a specific site with the knowledge users. For example, a capstone project would be expected to have a plan for sustainability to maintain the intervention at the site. In the initial interview, Participant 2 described *sustaining knowledge use* as way for the faculty or university to keep a record of the student's projects: "The sustaining knowledge use, I would say, is utilized in keeping a repository of all those projects and

then they're available for students as well as clinicians to access for future projects." This seemed to indicate a misunderstanding of the KT construct *sustain knowledge use*.

Clarity After Framework Introduction

After participants were introduced to the KTA framework, there seemed to be increased understanding of KT and how it relates to their curriculum. For example, during a follow-up interview, one participant recognized how they use certain aspects of KT, "because I mean, this follows what we do. It just uses different words" (Participant 2). Participant 6, during the follow-up interview, stated that *sustaining knowledge use* was in their capstone projects, but students only needed to discuss sustainability: "I guess it's just the assignment—like we have an expectation that they talk about sustainability, but I think it's just the level of we haven't elevated it to like writing a formal sustainability plan, I guess."

Monitoring knowledge use was another KT construct that was misinterpreted and was not evident in the capstones, as described by Participant 8 during a follow-up interview:

> I think the monitor *knowledge use* an interesting piece too that we could probably incorporate a little bit more. I think when the students are out there just doing their doctoral capstone experiences, they're so much in the thick of it that they're not necessarily always thinking about how they're monitoring their knowledge or using their knowledge.

When introduced to the KTA framework, Participant 9 was able to recognize how students might *adapt knowledge to a local context* and *assess barriers to knowledge use*:

> I do think there's definitely the element of adapting knowledge to the local context, . . . bridge between what the student's doing and then how to package that so it's useful to the site they're working with. . . . That's definitely a big piece of the capstone, . . . assessing barriers to knowledge use. . . . Our students

> definitely do pretty good needs assessments, . . . although I don't know if we really explicitly talk about assessing not only the needs of an organization, but what are the barriers to using evidence-based practice kind of things.

Overall, participants had a mix of understanding KT before and after introduction to the framework. There seemed to be increased understanding of KT and how it could be used in the capstones after it was shared with participants. Participants seemed to recognize certain aspects of the KTA framework within their curriculum, especially concerning the needs assessment.

Advantages and Challenges of Incorporating Knowledge Translation

When asked about the advantages and challenges of incorporating KT into the capstones, nearly all participants described many advantages, while four participants described challenges. Advantages included the practicality of using the KTA framework for both students and faculty, the alignment of the framework with current curriculum, and the opportunity to advance student learning. Faculty also described how the framework can facilitate increased recognition of context and adaptation, which can lead to increased client benefit in various settings. Challenges included feasibility and time constraints, specifically timing regarding completing the needs assessment.

During a follow-up interview with Participant 2, I shared the KTA framework and asked about the advantage of using it. Participant 2 responded: "I think it gives a really good framework, like it shows the students how it happens." This participant also provided an example of how this framework could have been used for a student project. They were able to identify all the concepts and how they fit into a project. Other participants also seemed to respond favorably to using the KTA framework. Participant 5 explained during a follow-up interview: "I like this. . . . I'm not familiar with Graham's

diagram here. But I must say, I do like it because it really, it gives a kind of a frame for what we're doing. . . . Everything is so definitely contextual."

Participant 6, once introduced to the framework during a follow-up interview, stated that it was helpful for both students and the capstone coordinator: "I think it'd help them to visualize it more. . . . The framework could help the students. But I think it could also help the capstone coordinator work visualizing the process as well." Participant 11 recognized how this could be incorporated into their capstone manual: "I'm really excited because I think there are words that you could take from our capstone manual that you could plug into each of those . . . use this framework." Another participant described how this could be useful to faculty: "The faculty could use something like this to help the students see what they're doing" (Participant 3).

After understanding the terminology, one participant described incorporating the framework because of its alignment with their curriculum: "They're all in somewhere, they're reflected somehow through the capstone. . . . I see glimpses of each in some way . . . to coincide with what we're learning during that class and doing each course. It's similar to what I do in my teaching and learning" (Participant 12). Participant 8 recognized how the framework could fit into their curriculum while also enhancing the doctoral experience: "So I could definitely see in lots of different places in our curriculum. . . . It absolutely lends itself to the doctoral experience." Participant 6 also recognized how the KTA framework could enhance capstones, "really taking some of these projects on . . . and not just, you know, going with the status quo." Participant 5 had a similar recognition related to the learning opportunities the KTA framework could provide with a student's future employment: "When you're sitting in front of a future

employer and your employer's like, 'You've done this doctoral capstone. Why don't you tell me about what you accomplished?'"

Several participants were able to recognize the advantages of using the KTA framework specifically in regards to project context. For example, Participant 10 commented on adapting knowledge to the local context: "Adapting knowledge to local context. Yeah, because they have to make adjustments because no environment is the same. . . . When you [are] translating that, the research, to evidence-based research into practice, . . . it's not a one size fits [all]" (Participant 10). Another participant, after being introduced to the KTA framework, recognized the importance of identifying a problem:

> Interesting because, like, you know, students go and they'll say, . . . "I want to do a life skills project, and I want to do it with these kids in the foster care system." I say, "That's great. . . . But do they need that?" . . . They don't identify problems. (Participant 12)

Participants described the benefit the framework could bring to community partners by adapting to the local context. For example, Participant 3 stated:

> Adapt knowledge to local context. . . . I think that the capstone does that because they are taking the information that they found and applying that knowledge to that community partner. I can see how this would help.

Participant 6 described how the KTA framework could be used to engage community partners in the project by assuring them it would be specific to their needs: "Definitely having a framework helps . . . approaching community partner sites and trying to sell them on this process. So I think having like a framework to say, hey, this is where, this is what we're doing." Recognizing that community organizations would not experience major effects during the 14 weeks of the capstone and this framework offered an opportunity for the project to continue in the organization, Participant 5 stated, "How

does this continue to keep evolving? Maybe this is going to be a program that's developing for this chapter, but that may go like organization wide. Is that reasonable? Is that feasible? Probably not in 14 weeks." Participant 1 recognized the advantages the KTA framework could provide to OT practitioners on site as well: "Those strategies just live in journals and in conference proceedings, and those strategies don't reach the OT practitioners that are expected to use those strategies."

Time and feasibility were two challenges to using the KTA framework recognized by participants. A few participants described time constraints. Specifically, they described challenges with the needs assessment being completed a year prior to going on site and the possible changes that could occur within that year. Participant 3 stated:

> Do that needs assessment earlier . . . then when they get on site, if something has changed a year later, . . . how can we tweak this program to make it meet your needs now so they don't have to start over?

Participant 5 described a similar challenge: "The site's needs sometimes change . . . which would also be a challenge because when we set these up a year in advance and I mean we have to do that."

Lastly, Participant 9 described feasibility challenges regarding certain KT concepts such as monitoring, evaluating, and sustaining knowledge use:

> I think where maybe we fall short a little bit is monitoring knowledge used in evaluating outcomes and sustaining knowledge. . . . We only have 14 weeks on site, whatever that kind of means for their project. . . . But, you know, I don't think we have a real in-depth way that students kind of do that piece of it.

Theme 3 Summary

In general, these results illuminated various degrees of faculty understanding of KT and the advantages and challenges to incorporating KT in capstones. After

introduction to the framework, participants were able to recognize how KT is and is not reflected in their curriculum and the KT concepts that could be incorporated in the capstones. Most of the participants responded quite favorably to incorporating the framework, recognizing the practicality of it. These findings suggest that increased faculty understanding provides opportunities to incorporate KT in OTD capstones, which can also benefit students and community partners.

Main Finding

Following exploration of faculty perceptions and institutional documents, findings suggest clear opportunities to promote KT in capstones with increased faculty understanding and curricular support. The above findings were organized into themes from data collected from capstone document content analysis as well as individual interviews with OTD faculty. The original research question—*How is KT reflected in entry-level OTD capstones?*—was addressed in the first and second theme from analysis of capstone documents and faculty interviews. After thorough analysis of interview transcripts, a new research sub-question emerged—*How are capstones shaped by faculty perspectives?*—which was reflected in the second theme. The second research question, *How can KT be promoted in entry-level OTD capstones?* emerged as part of Theme 3. Research questions cannot be fully understood by an analysis of their parts; rather, there is a need to understand the whole and the relationships among those parts (Bleakley & Cleland, 2015). This final section serves to summarize the main findings in reference to the research questions.

How Is Knowledge Translation Reflected in Capstones?

Some foundational concepts of KT were reflected in the capstone documents as well as faculty interviews. These included *problem identification, adapting knowledge to local context, assessing barriers and facilitators to knowledge use,* and *stakeholder engagement.* Other KT concepts were minimally reflected or nonexistent. Those included *selecting, tailoring, and implementing interventions, sustaining knowledge use, evaluating knowledge outcomes,* and *monitoring knowledge use.*

Certain KT concepts reflected in the capstones were reasonably expected, as the curriculum required a needs assessment. The needs assessment often included completing a comprehensive literature review, identifying a problem or research question, interviewing stakeholders, and assessing the needs of the knowledge users or clients. This is a strong element in the capstone, as it is a requirement in the ACOTE standards, and it was also highly valued by participants as part of the curriculum. For example, Participant 10 was able to recognize the problem identification concept as part of the needs assessment:

> Find a specific topic and being able to identify trends and what's happening, what's successful, what needs are there in the community. . . . I'm seeing the [problem] identification through their needs assessment. They're reviewing literature and identifying what areas there are to pursue within practice.

During a follow-up interview, Participant 5 described the requirement to engage the stakeholder in the planning process during the needs assessment: "In the beginning when we're doing like the, like identification of challenge, issue, problem, like as part of the needs assessment that the students do, they have to talk to stakeholders" (Participant

5). All the participants described the importance of the needs assessment to help the students identify the problem as part of the planning process for the capstone.

Most capstones described lack of time and feasibility as a capstone implementation barrier. One capstone directly described lack of time as a limitation: "The provided length of time for this capstone project is acknowledged as a limitation" (Capstone 13). Capstone 9 had difficulties assessing client outcomes due to lack of time: "Client outcomes were not fully assessed due to the project ending prior to completion of all elements of the program for each of the clients." While the capstones reflected only a clear lack of time as a barrier, the participant interviews described more in-depth reasons for barriers.

Participant 1 stated that most of their students did not implement their capstones, typically due to big student project ideas, lack of time, and work overload:

> So many students have this grandiose idea that they're going to take their diabetes management program and implement it successfully with every patient . . . and then be able to collect client outcomes in the short period of time that they're there. I would say 75% of our students, they can't. . . . We throw a lot at our students and we know that, and sometimes I, you know, sometimes I worry it's too much.

Additionally, Participant 1 discussed the need for better communication between sites and students to ensure feasibility and successful implementation: "Have an open-ended transparent conversation with site mentors about what can feasibly be implemented in practice and what we've really addressed the needs of the site, because . . . that's the big disconnect, right?" This seems to capture the value of implementation for the site and student but also the constraints present due to big projects and lack of time.

How Are Capstones Shaped by Faculty Perspectives?

When participants were asked about their expectations for the capstone and how those expectations were outlined for the learner, the responses included a variety of values and constraints. They expected the capstones to be a culminating experience that offered opportunities to increase student self-efficacy and research capacity. They also expected capstones to be implemented and disseminated while increasing the reach of OT in communities. Along with these expectations were the constraints that may inhibit various actions, including project feasibility and lack of sustainability in capstone projects. Participants recognized recent ACOTE standard changes and the effect they had on the curriculum and capstones. They discussed their level of understanding about KT and recognized the advantages and value of incorporating KT into the capstone.

Several participants described how mentoring students helped guide students with building self-efficacy. Participant 4 described this mentoring approach: "They may want to do something that's really beyond their level of competency. . . . [I] don't want them to be set up for failure. . . . [We] need to guide them in proper selection of a project and the timelines and the expectations." One participant described the capstone as something that helped future endeavors: "So if you could say, look, guys, this is what we're planning on doing, and this is why this is useful—not just the capstone, but moving forward in your career" (Participant 3). Additionally, participants seemed passionate about helping their students realize their potential and pushing them to build resilience and be more self-directed—characteristics that could be carried forward throughout their careers. For example, Participant 2 stated:

> We have them think about a problem or think about something that they're very interested in and then . . . we really want them to bring it from within because

> they spend over a year thinking about and planning and then implementing this project. And if it's not something that you've organically created yourself, I think it's really hard to stay . . . engaged in the whole time and the whole process.

Participant 5 described how they teach resilience and support students in finding their motivation:

> And this is filtering back to this capstone planning process of supporting them and developing real resilience. . . . And so again, just supporting them in this development process also within this [capstone preparation] course. . . . The needs assessment really takes a look at what's their personal motivation, what does society say about this, what's the profession say about this.

The most common constraint discussed was feasibility or lack of time for capstone implementation. This was evident in both the capstone documents and interviews and was also discussed in previous sections. Although these were discussed in previous themes, upon further analysis it became more apparent this was a constraint on faculty actions. For example, one participant described the constraints brought forth by the new standards:

> I guess the ACOTE changes from 16 to 14 weeks, I didn't really agree with. I would like it to be a longer rotation because, I mean, even 16 weeks is very fast for someone to be able to really do doctoral-level work on a project, especially something that's new or organic. And so you're really rushed when the time is even shorter. (Participant 2)

When asked about their thoughts on sustainability, several barriers were mentioned such as time constraints, contextual constraints, and resource limitations. For example, Participant 3 described time constraints: "I don't know that the capstone is long enough to be able to say they're sustaining." Contextual and resource constraints were described by Participant 9:

> I think probably we could do a better job of assessing if those sorts of projects, if the works our students are doing are actually creating that change. . . . I don't

> know if folks are continuing those programs that they developed or they're still using the resources the student develops for them.

One participant discussed how capstone sustainability may impact community mentors and the profession:

> That's one thing that I'm really like hardcore on sustainability. . . . How are we going to continue to develop our profession? I've got to have these things that we're having our students do be meaningful to the stakeholders and meaningful to clinicians in our profession. Because otherwise it's like, OK, it was just an assignment. . . . No, it's more than that. (Participant 5)

Overall, it seemed faculty had the best intentions and expectations for their students and their projects but were frequently limited by time and resources.

How Can Knowledge Translation Be Promoted in Capstones?

Nearly all participants responded positively when introduced to the KTA framework and recognized advantages to incorporating it into capstones. After participants were shown the KTA framework, they were asked about various KT elements that may or may not be present in their capstones. They were also asked to share their thoughts about how they might incorporate KT in capstone projects. Participants shared a variety of responses related to their current curriculum and effects of recent curriculum changes, the constraints they face, and the potential benefits of KT in capstones.

When asked how they were incorporating the recent educational standard changes, participants described how they planned to revise the curriculum:

> Try to diversify . . . or scale back and just keep it where we're at? . . . I think we've graduated four cohorts now, so it's still relatively new for us. . . . In terms of change, we're still exploring what's gonna work best for us. (Participant 6)

Participant 10 described how they plan to meet new standards while continuing to adapt and improve: “I think we’re in good shape for . . . meeting the requirements of the standards, but oh, there’s always room for improvement. So we constantly do our own program evaluation for each cohort that graduates.” When asked about how the new standard affected their curriculum, Participant 7 replied the change required the needs assessment to be moved up by two semesters before the student went on site. They were able to recognize a way to adapt the curriculum so the needs assessment and contact with stakeholders could be started earlier:

> So they do a CAT [critically appraised topic] in that class and . . . how can you do a needs assessment if you’re not there on site. . . . They can still do a very rigorous and comprehensive literature review and they can also talk to them [stakeholders]. (Participant 7)

All the participants described the importance of the needs assessment to help the students identify the problem as part of the planning process for the capstone. For example, Participant 8 described how the needs assessment of the capstone reflected several KT concepts:

> Students start off with the needs assessment, so they’re identifying a problem at the site and complete a literature review. So I’m thinking that’s the *adapt knowledge to local context* piece of things. I think that all kind of comes with a needs assessment, so they’re talking with the site and figuring out and what’s feasible, what can and can’t be done.

While nearly all participants recognized advantages to incorporating KT into capstones, some participants described possible constraints associated with capstones such as feasibility and limited sustainability. Several participants expressed concerns regarding sustaining knowledge use. They believed faculty would be responsible for sustaining the project after the student left. For example, Participant 6 stated, “Some of

that sustainability piece is also like the site's excited . . . but I don't know that we really have the manpower or the resources to keep it up when these are our top five projects right now." Participant 9 was able to identify a perceived barrier to what they believed sustainability entailed, stating, "Maybe setting up some systems that help sustainability and evaluating outcomes that hopefully will continue. But we don't have a great way of kind of seeing it through necessarily." This belief was also stated by several other participants, who believed sustaining knowledge would require more manpower from faculty or students to maintain it during multiyear projects. This finding seems to suggest that KT reflected in both the capstones and faculty interviews were congruent. The needs assessment illustrated several components of KT, and the faculty were also able to recognize this as a reflection of KT. Additionally, the components of KT that were not present in the capstones were also recognized by faculty as areas that were missing and areas in which to improve, especially after participants were introduced to the framework.

When asked about potential benefits from incorporating KT into capstones, participants shared examples of past capstone projects where students could have used the framework and the potential benefits of KT. A few participants described the benefit of KT in capstones as a way to implement evidence. Participant 1 stated, "All the work that comes out, . . . it's not trickling down to people that are actually expected to use evidence." Participant 2 stated:

> So I think this gives a visual schematic of how the process works and also how it can be sustained for future students. . . . If they find something that's compelling in their evaluation of their outcomes, then they can say a student could be really great here and maybe work with the clinical site.

Participant 9 also described benefits of KT in capstones: “I think it’s helpful to break it down into these different pieces so you can . . . think about what pieces are being done and maybe what’s not being done, . . . look at where the focus is.”

Several participants described what they were currently not doing but should be doing in regards to KT. Once introduced to the framework, Participant 9 recognized their own limitation regarding KT, stating, “I think this is a huge thing for me to think about because I think . . . I have implicitly thought about this [evaluate outcomes] in terms of knowledge translation, but I think that explicitly I don’t think that I’ve really incorporated it.” Participant 2 described how they do not expect students to evaluate knowledge outcomes, but realize it is needed: “And so that is, I guess, in a way evaluation, but it may, it’s just based upon the objective that they’re giving. Like, how do we, how do you show [outcomes]?” Another participant described feedback from students regarding timing of stakeholder engagement and problem identification. Specifically, Participant 6 described how students plan their project based on their interest and not the stakeholder or client need:

> Some of the feedback we got from our students as they were identifying their [problem] question before they met with the stakeholder, . . . that was taking them down a path that they wanted to stick to when they did the needs assessment rather than really the site guiding that process.

Summary

This chapter has presented results of a qualitative descriptive analysis using grounded theory methods. Ten capstone documents were analyzed deductively using the KTA framework and analyzed inductively as codes emerged. Twelve participants were interviewed individually. Interview questions were structured to help answer the research

questions: *How is KT reflected in entry-level OTD capstones?* and *How can KT be promoted in entry-level OTD capstones?* During the analysis, a sub-question emerged to better understand faculty perspectives regarding the capstone process. Participants represented a diverse sample of private and public universities from across the country with experience ranging from 1 to 30 years in academia. The capstones were completed between 2016 and 2020 and were from two different universities based on public access.

The three themes resulting from this study summarize the contributing factors that support promotion of KT in OTD capstones: (1) operationalizing foundational concepts of KT, (2) operationalizing how the capstone process is influenced by faculty perspectives, and (3) operationalizing advantages and challenges to incorporating KT into capstones. These themes provide a description of how KT is reflected in completed entry-level OTD capstones as well as the perspectives, advantages, and challenges to incorporating KT in capstones from OTD faculty interview participants. In general, certain KT concepts such as *problem identification, adapting knowledge to local context, assessing barriers and facilitators to knowledge use,* and *stakeholder engagement* were reflected in OTD capstones. Other KT concepts such as *selecting, tailoring, and implementing interventions* and *monitoring, evaluating,* and *sustaining knowledge use* were only minimally reflected or not present at all. Findings suggest that capstones were influenced by faculty perspectives as well as faculty understanding of KT and how it can be incorporated into capstones. The main finding suggests that there are clear opportunities to promote KT in capstones with increased faculty awareness and curricular support. These results and their implications are discussed in Chapter 5.

CHAPTER 5:

DISCUSSION

The purpose of this qualitative descriptive study was to explore how knowledge translation (KT) is reflected in entry-level doctorate of occupational therapy (OTD) capstones and how KT can be promoted in capstones. After a discussion of limitations, this chapter interprets the findings as related to the literature on KT in occupational therapy (OT) research and practice, as well as the knowledge-to-action (KTA) framework and complexity theory. The reflections section discusses my reflexivity, the challenges during this study, biases, and general lessons learned as a researcher. A discussion on future research implications as well as the translational aspect concludes this chapter.

Following exploration of faculty perceptions and institutional documents, the findings suggest clear opportunities to promote KT in capstones with increased faculty and curricular support. This overarching finding is complex and comprises three themes. Themes suggest that promoting KT in capstones entails operationalizing (1) how capstones currently reflect KT concepts; (2) how the capstone process is influenced by faculty perspectives, including values and constraints; and (3) what advantages and challenges exist to incorporating KT into capstones. Some factors relate primarily to the content of the capstone documents, some to the interviews, and some to both. All of these factors suggest that with support from both faculty and the curriculum, KT can be promoted in capstones.

Limitations

Several limitations were evident in this study. Out of 38 entry-level OTD programs, only two programs had public access to capstone documents, making for a small sample size. It may have been more valuable to analyze a wider sample of capstones. Although there was a good response for interviews, it may have added value to interview certain key stakeholders with KT and/or OT education expertise. Additionally, during the time of data collection, major changes were occurring due to a global pandemic. Educators were forced to quickly transition in-person learning to online. This may have contributed to lower participation. Because only two programs offered public access to completed capstone documents, I was unable to associate any faculty interviews with capstones from their respective programs. While the new Accreditation Council for Occupational Therapy Education (ACOTE) standard suggests using KT, it is not a rigid requirement. KT has just recently been added within the scholarly standards, which may have limited the participants' knowledge and experience with KT. Some OTD programs may prioritize different educational constructs or themes in their curriculum. Additionally, the content analysis of capstones is not a definitive indicator of how OTD programs may be teaching KT. The deductive analysis could have been limited by using the KTA framework. As a new researcher, I bring limitations in my analysis and also have biases as an experienced occupational therapist and prospective OT educator.

Interpretation of Findings as Related to the Literature

Despite the limitations discussed above, the results yielded interesting findings as the basis for continued research within this area. This analysis was the first to explore how KT is reflected in OTD capstones through document analysis as well as individual

interviews. Although some KT concepts were reflected in capstones, this interpretation also discusses which KT concepts were not reflected. Additionally, although there was a mixed understanding of KT from participants, the findings from the interviews were congruent with the documents. This analysis revealed how KT is reflected in capstones, the importance of faculty understanding of KT, as well as how the capstone process is influenced by faculty perspectives. These results suggest a clear opportunity to promote KT in capstones with increased support from both faculty and curriculum.

How Knowledge Translation is Reflected in Capstones

The content analysis of 10 completed OTD capstones as well as the 12 faculty interviews helped to clarify how KT is reflected in capstones. Utilizing the KTA framework for the content analysis revealed that each capstone contained at least one KT concept; however, certain concepts were more apparent than others. Given every capstone required a needs assessment, as this is an ACOTE standard, I anticipated seeing elements of KT reflected in the capstones. The faculty interviews also revealed similar findings of how KT was reflected.

Overall, the KT elements reflected in both the capstone documents and interviews included *identifying the problem, adapting knowledge to local context, assessing barriers and facilitators to knowledge use,* and *stakeholder engagement*. These were evident in most capstones and discussed by a majority of participants. It stands to reason that these KT elements would be present, as they are typically part of the needs assessment, which is a requirement in the capstone curriculum and an ACOTE standard. Specifically, Standard D.1.3 states:

> Preparation for the capstone project includes a literature review, needs

> assessment, goals/objectives, and an evaluation plan. Preparation should align with the curriculum design and sequence and is completed prior to the commencement of the 14-week doctoral capstone experience. (ACOTE, 2018, p. 45)

Most participants welcomed the change of moving up the deadline for completion of the needs assessment. They believed conducting the needs assessment during the 14-week capstone experience was too late. Additionally, participants described how the needs assessment facilitated student self-efficacy, research capacity, and communication with stakeholders. The needs assessment typically consists of a literature review to identify a problem or service gap for a population, engagement with stakeholders to determine needs of the population, and goal setting for the intervention (DeIuliis & Bednarski, 2020; Jirikowic et al., 2015). This is completed before the student goes on site, but is expected to continue after the student begins the capstone experience (DeIuliis & Bednarski, 2020). The assessment offers an opportunity for the student to assess barriers and facilitators to knowledge use and adapt interventions to the local context. By conducting the needs assessment earlier, there is a better chance of a more thorough planning phase, which can improve chances of implementation.

This sample of capstones and interviews indicated the importance of stakeholder engagement throughout the entire capstone process. This KT concept is also similar to the scholarship of application as defined by Boyer (1992). Boyer's scholarship of practice model identifies four types of scholarship: scholarship of discovery, integration, application, and teaching and learning (Boyer, 1992). The scholarship of application involves collaboration between stakeholders and knowledge users. Specifically, in OT literature, it has been described as merging "scholarly activities with community service in a search for solutions to contemporary societal issues" (Jirikowic et al., 2015, p. 215).

Although engaging stakeholders is not explicitly illustrated in the KTA framework, Graham and colleagues (2006) discussed the importance of stakeholder engagement throughout the entire KT process. These stakeholders can include practitioners, clients, policymakers, researchers, and local citizens, with different stakeholder involvement at different times (Graham et al., 2006; Sudsawad, 2007). The sampled capstones illustrated stakeholder involvement throughout the process, including clients, caregivers, healthcare professionals, management, and community partners, suggesting a wide diversity.

A majority of the participants described how communication with various stakeholders allowed students to be more self-directed, more self-reflective, and better communicators. Engaging stakeholders throughout the capstone process suggests an opportunity to increase students' efficacy by challenging them to think about the problem and seek out those who can benefit and offer insight. This finding is similar to results of earlier studies that described the importance of shared decision-making with a diverse group of stakeholders. Although a study by Jirikowic et al. (2015) involved an OT entry-level master's program, a capstone project and experience was required, similar to that in OTD programs. They found a positive outcome of stakeholder engagement by facilitating knowledge exchange between community partners and faculty. They also discovered increased evidence-based practice and an increased role of OT in areas where no OT was currently present.

In a study by Gitlin et al. (2010), stakeholder engagement success was emphasized by embedding a variety of stakeholders, including clinicians and policymakers. This study was an exemplar for highlighting the significance of shared decision-making and understanding. A recent publication from the Center on Knowledge

Translation for Disability and Rehabilitation Research by Heiden and Saia (2021) discussed the importance of stakeholder engagement in KT to build trust and rapport, recognize and understand context, and deliver beneficial findings. Experience with successful stakeholder engagement can lead to increased leadership abilities, communication, and recognition of the complexity of real-world problems (DeIuliis & Bednarski, 2020).

How Knowledge Translation Is Not Reflected in Capstones

While there was evidence of various KT elements in capstones, many KT elements were not reflected. Those elements included *selecting, tailoring, and implementing interventions* and *monitoring, evaluating,* and *sustaining knowledge use*. A somewhat surprising finding was the paucity of implementation of the capstones. This finding was similar to a study conducted by nursing scholars who evaluated doctor of nursing practice (DNP) scholarly projects for rigor and value. In the study by Roush and Tesoro (2018), only a small percentage of DNP scholarly projects were implemented. This trend was apparent in both the capstone documents as well as the faculty interviews. Analysis of capstone documents and interview transcripts revealed there was little to no evidence of a systematic effort to facilitate adoption of knowledge, or implementation, as defined by the KTA framework. This framework phase involves the planning and application of "interventions to facilitate and promote awareness and implementation of knowledge" (Graham et al., 2006, p. 20). Participants explained that their expectation for implementation was to hand over information to the capstone site, but there was no systematic process for implementation of the capstone project. According to Straus et al. (2013), the main reason for KT is to implement knowledge into practice to improve

patient outcomes. This is paramount to successful KT and should be treated as such in capstones.

Participants described feasibility and time as common barriers to successful implementation of the capstone projects. Most participants did not believe the 14-week time frame of the project was long enough to implement the project and evaluate outcomes. While this seems like a logical barrier, there is still value for students, faculty, and project stakeholders to make a strong attempt to implement the project fully. Not only does the project advance student knowledge and skills in a variety of areas, but the process of completing the project in 14 weeks helps students learn how to adapt and cope with tight timelines and setbacks. These can be common occurrences in real-world practice and provide valuable learning experiences. DNP scholars' discussion of capstone implementation also acknowledged this as a valuable learning experience for students (Huber et al., 2018; Kirkpatrick & Weaver, 2013; Root et al., 2018; Roush & Tesoro, 2018). Root and colleagues (2018) supported the notion that capstone projects are frequently conducted in complex, rapidly changing environments where adaptation and resiliency are required during implementation. This study's findings are consistent with previous results from Roush and Tesoro (2018) showing project implementation requires knowledge and leadership skills and adaptive abilities to overcome challenges often seen in practice change.

The constraints to implementation described by participants and capstones seem similar to the extensive number of publications regarding the struggles of occupational therapists implementing evidence-based practice (EBP). Implementing EBP in OT has been a trending topic for decades, with many scholars discussing the challenges and ways

to overcome them (Bennett et al., 2003; Cramm et al., 2013; Juckett et al., 2019; Lin et al., 2010; Metzler & Metz, 2010; Myers & Lotz, 2017). Through the years, OT scholars have discussed the importance and benefits of EBP while also identifying barriers to using EBP such as lack of resources and time (Lin et al., 2010; Perkins et al., 2020; Rappolt & Tassone, 2002; Swedlove & Etcheverry, 2012). Cramm and colleagues (2013) described the threat of poor quality care when occupational therapists do not systematically apply knowledge but rather rely on convenience, treatment preferences, and anecdotal knowledge.

A recent publication by Juckett et al. (2019) provided action steps for more effective implementation, including collaboration between researchers and practitioners. They also suggested designing and evaluating studies that measure implementation outcomes such as appropriateness and sustainability (Juckett et al., 2019). This is similar to the KTA framework in regards to stakeholder engagement, adapting knowledge to the local context, and sustainability. Incorporating KT into capstones could offer an opportunity to meet these action steps. KT provides a means to increase successful implementation of the intervention and evaluate outcomes. Successful outcomes could also increase reach in the community. Most participants described the many opportunities provided by the capstone to the community as well as the university. They explained how the capstone can increase reach in the community and demonstrate the value of OT.

Without a more systematic approach to implement or translate knowledge, there seems to be a missed opportunity for greater impact on the community and an increased value of OT. Participants described opportunities to increase the reach of OT in communities. One way to measure benefit in organizational practice and patient care is

with the modified Kirkpatrick-based model (Milota et al., 2019). The Kirkpatrick (1959) model, initially developed to evaluate training programs in corporate organizations, has now been modified to become a common instrument for analyzing the success of programs in higher education, including health profession schools (Milota et al., 2019).

Capstones have the capacity to improve outcomes at various levels of the modified Kirkpatrick-based model and are likely most effective at the fourth level, changes in organizational practice and benefits to patients and clients. The purpose of the implementation phase of a capstone project is to determine how it affects the knowledge users or clients (DeIuliis & Bednarski, 2020). The DNP literature has identified that practice-based projects, such as capstones, require successful collaboration between students, the community, and the university (Brown & Crabtree, 2013). These collaborative projects are advantageous to not only the student who is increasing multiple skills, but also the community that experiences a unique skill set from the student to help address its needs (Brown & Crabtree, 2013; DeIuliis & Bednarski, 2020; Kirkpatrick & Weaver, 2013). These projects help strengthen partnerships between universities and communities and address gaps in a variety of health services. This type of collaboration provides a win-win situation for the student and the capstone site (Brown & Crabtree, 2013; DeIuliis & Bednarski, 2020).

Although there was minimal *selecting and implementing knowledge*, there was more evidence of *passive diffusion* and *dissemination* of information, most likely due to the curriculum requirements of the capstone. Though all the participants described various dissemination strategies, this was not necessarily a requirement but rather a suggestion. The curricular requirement was to disseminate, or present, the project to

faculty and mentors at the semester's end. Dissemination expectations included sharing the capstone project outcomes via PowerPoint, slide shows, posters, papers, or videos. Faculty described encouraging students to share or disseminate their work at local and national professional conferences. This was not a requirement but was strongly encouraged. Most of the faculty explained the purpose of dissemination as increasing professional development, communication, and student efficacy. This seems to provide empirical evidence to begin to promote KT in capstones. For example, dissemination could be a requirement rather than just encouraged by faculty, resulting in students applying this aspect of KT.

The CIHR (2016) defined dissemination as selecting the right audience and adapting the message to them. Dissemination strategies can include briefings for stakeholders and informational sessions with clients, practitioners, administrators, and policymakers (CIHR, 2016). For a capstone project, dissemination includes tailoring the message or findings from the project to a particular audience, such as OT practitioners, educators, or researchers, providing opportunities to exchange knowledge. According to DNP scholars, dissemination also provides opportunities to reflect on outcomes, ensure practice relevance, and promote project innovation (Huber et al., 2018; Root et al., 2018). Most DNP educators require dissemination of capstone projects. In a recent scoping review by Perkins et al. (2020), they revealed there were far more abstracts from conference posters and presentations about KT approaches in OT rather than full-length published articles. In other words, KT research is not being disseminated in a way that is easily accessed by practicing OTs (Perkins et al., 2020). While presenting at conferences is important, it is difficult for those who do not attend the conference to gain the

knowledge needed from a published abstract, as such abstracts are often not very detailed or easily replicated (Perkins et al., 2020). Effective dissemination can begin to close the gap between the capstone project findings and changing practice (DeIuliis & Bednarski, 2020; Perkins et al., 2020).

Because there was little evidence of systematic implementation of the capstones, it is not surprising that there was little to no evidence of other KT concepts such as evaluating, monitoring, and sustaining knowledge use. Before the start of the capstone, the student should complete an evaluation plan, including evaluation of the impact and project outcomes (DeIuliis & Bednarski, 2020). The student has the knowledge and skills to collect, interpret, and report data and should be completing a formal evaluation of client and practice outcomes (DeIuliis & Bednarski, 2020). Very few capstones had evidence of evaluating knowledge, measuring intervention outcomes, and effectiveness. One capstone completed a thorough evaluation of the intervention effectiveness and also determined how continued OT intervention could be valuable to the program. Other capstones only discussed what an evaluation might look like if there was successful implementation. Faculty explained how evaluation outcomes vary depending on the type of capstone project. They encouraged students to evaluate outcomes; however, if there was no actual implementation, students were required to have an evaluation plan. This is another missed opportunity to begin to evaluate impact. Program evaluation has been described in the DNP literature as an important skill, as it impacts both patients and systems (Kirkpatrick & Weaver, 2013). Evaluating knowledge outcomes, as described by Graham and colleagues' (2006) KTA framework, measures the impact of knowledge use and is the only way to determine if uptake of knowledge was successful.

Without implementation and evaluation of knowledge use, it stands to reason there was no evidence of monitoring or sustaining knowledge use. These KT concepts happen once implementation has been executed. None of the sampled capstones reflected monitoring or sustaining knowledge use. Faculty had a variety of perceptions about monitoring and sustaining knowledge. For instance, some faculty perceived monitoring knowledge use as a way to monitor the student's knowledge. Additionally, faculty had a misunderstanding of sustaining knowledge, believing it pertained to sustaining the student's knowledge. Sustaining knowledge use, according to Graham et al. (2006), should be planned early in the project to ensure a system is in place after successful implementation. This study's findings are consistent with findings from Roush and Tesoro (2018), who found that DNP projects did not evaluate how knowledge was sustained nor its effect on patient outcomes.

The KTA framework describes monitoring knowledge as a way to "determine how and to what extent knowledge was diffused throughout the potential-adopter group" (Graham et al., 2006, p. 21). In other words, was the intervention effective in achieving the desired results, or does the intervention require modification or a new intervention? Due to the short period of 14 weeks and dependent on the intervention, this may not be feasible. However, it seems possible for the student to at least develop a plan to monitor and sustain the knowledge and teach the site stakeholders so they can follow through after the student leaves.

Ideally, the needs assessment should be used to address a sustainability plan (DeIuliis & Bednarski, 2020). A solid sustainability plan will benefit not only the individual knowledge users, but the organization and community (DeIuliis & Bednarski,

2020; Graham et al., 2006). In a study by Bennett et al. (2016), their project would have been limited if they had not addressed a sustainability plan, especially considering the high staff turnover. With their plan and recognition of staff turnover, they were able to accommodate and offer various tools to help maintain consistency with their intervention. This is an important step for effective KT and a necessary skill for OTD students to increase their ability to engage in practice-scholarship.

Faculty Understanding of Knowledge Translation

Overall, participants had varied degrees of understanding of what KT is and how it can be used in capstones. Participants recognized the ACOTE standard change but seemed to be confused about the terminology and how to use KT. Adding to the confusion regarding terminology, KT has been described as complex and multidimensional, having numerous definitions (Graham et al., 2006; Straus et al., 2013; Sudsawad, 2007). The terminology used by participants included "evidence-based practice," "research," and "sharing what is learned." These findings are consistent with the claim by Bennett and colleagues (2018) that despite recent advances in the use of KT in OT practice and research, there is still a void in OT education.

Several calls to action to use KT in OT research and practice have been made over the last 15 years (Bennett et al., 2018; Corcoran, 2006). Specifically, the research agenda from the American Occupational Therapy Association continues to push for increased research capacity, including KT (Burke et al., 2018). Given the relatively new OTD educational standards and the steady increase of accredited OTD programs, it is not surprising to see a lack of understanding regarding KT. However, increased understanding of KT could prove beneficial, as most academicians are expected to

engage in scholarship for career advancement. Engaging in student scholarly projects could be one approach to help advance scholarship for not only faculty but for students as well. Through the scholarship of teaching and learning as well as the scholarship of application, academics have the opportunity to prepare students for research and advance their professional development (Bilics et al., 2016).

Participants described KT in a variety of terms before being introduced to the framework. After introduction to the framework, participants described certain KT concepts that they already incorporated into capstones. For example, participants illustrated how problem identification and stakeholder engagement were reflected in the required needs assessment. They also explained the areas where their curriculum fell short with incorporating KT, such as implementing, evaluating, monitoring, and sustaining knowledge outcomes. Although they recognized their shortcomings regarding incorporating KT, they did not completely acknowledge their lack of understanding. Instead, they described numerous barriers such as the accreditation standard changes and feasibility and time constraints, adding to the complexity of change.

While educational standards have been set forth by ACOTE, each program has a slightly different curriculum and expectation about capstones. This may also be a contributing factor in regards to incorporating KT into capstones. This finding is similar to literature from DNP scholars, who suggested that differences in how DNP projects are conducted and assessed create an educational challenge, which might be linked to a lack of understanding or consensus regarding the knowledge and abilities that DNP graduates are expected to possess (Huber et al., 2018). The level of integration of knowledge into practice is influenced by several factors, and the great diversity of the practical contexts

adds to this complexity (Metzler & Metz, 2010). Utilizing frameworks can be an effective approach to translating knowledge to practice (Graham et al., 2006).

Zooming out and looking at the complexity of KT in general, we are reminded of the importance of understanding the process involved in applying knowledge and facilitating change. KT itself is a complex process requiring multidirectional communication and interaction with stakeholders (Graham et al., 2006; Sudsawad, 2007). While there is a paucity of literature regarding KT in OT education, we can still recognize the challenges associated with change. Implementing EBP in OT has been a challenge for years. Lin et al. (2010) commented that the challenge to occupational therapists incorporating EBP could be due to their lack of understanding, the goal, and steps associated with EBP. Practitioners may feel uncertain and discouraged about the process of finding and using EBP, thereby limiting implementation of evidence (Lin et al., 2010). Given the complexity of organizational change often associated with healthcare practice, it stands to reason that university faculty may also experience challenges to incorporating something new, like KT. Roush and Tesoro (2018) also discussed the need for increased faculty support and training "to guide students in practice and system change" (p. 442) and have a better understanding of implementation science. With increased faculty awareness and curricular support, these findings suggest an opportunity to promote KT in capstones.

Faculty Perspectives and Influence on the Capstone Process

It is necessary to comprehend the numerous relationships that exist between people and systems, as well as their consequences (Bleakley & Cleland, 2015). Understanding the complexity of problems and systems necessitates an understanding of

the essential notions of linearity and nonlinearity (Bleakley & Cleland, 2015). For example, initially analyzing interviews and documents separately and then taking a deeper analysis of them together allowed a more holistic perspective to appreciate the various contextual and conditional influences and relationships. The capstone experience is part of a broader structure that is influenced by a variety of factors. The ACOTE standards provide the basic criteria for programs, but it is the responsibility of the program director to develop the curriculum in accordance with the university and program mission and values. Additionally, the capstone curriculum is influenced by how the faculty teach.

The results presented in Theme 2 illustrated how the capstone process was influenced by faculty perspectives. Most faculty discussed their various perspectives about the capstone as well as their expectations for the capstone. They identified the various benefits and constraints within their curriculum and the capstone, especially how the revised accreditation standards had influenced their curriculum. The influences that accreditation standard changes had on the curriculum are an example of a complex system of interrelated factors.

Similar to this interpretation is the Systems Theory Experiential Learning Framework (S.E.L.F.) developed by Delbert et al. (2020). The S.E.L.F. approach, which is based on the systems thinking model, helps link fieldwork and capstones, which are experiential components of the curriculum, with the OT program's theory, vision, mission, and intent (Delbert et al., 2020). The purpose of their research was to provide OT programs with a pedagogical framework to develop and evaluate fieldwork and capstone education (Delbert et al., 2020). Most participants described external influences,

including community partners and ACOTE, while internal influences included the university and OTD program. The present findings are similar to those from Delbert et al. (2020), who recognized similar internal and external influences on OT fieldwork and capstone education. By using a systems thinking approach, Delbert and colleagues (2020) recognized the relationships and influences with internal and external factors needed for their framework to succeed.

Most participants described their students as smart, inspired, and motivated, with a desire to accomplish a big, meaningful project, often requiring a reality check to keep the projects feasible. They explained the overwhelming amount of work required of the students and how to support them to succeed. Capstone projects are often conducted in dynamic environments, necessitating regular changes or course corrections during implementation (Root et al., 2018). This requires the student to be self-directed and resilient and have a high self-efficacy—all attributes described by most participants. A study by Hole et al. (2016) explored how students apply EBP after receiving training in their educational program. The current findings are similar to the those of Hole and colleagues (2016), who suggested that increased support from faculty on student ability to be more self-directed and have increased self-efficacy helps students identify factors associated with addressing a problem and facilitating change.

Most participants described how the capstone provided an opportunity to increase the reach of OT and demonstrate the value of OT while facilitating student efficacy and creativity. These results support previous findings from the DNP literature encouraging individualization, creativity, and innovation (Root et al., 2018; Terhaar & Sylvia, 2016). Recent literature about OT capstones found that most students perceived community

engagement, practical learning, and innovation to strengthen professional development (DeIuliis & Bednarski, 2020; Delbert et al., 2020). These factors can be a means to increase KT. Terhaar and Sylvia (2016) suggested that combining translational science with project-based learning presents an opportunity to increase change in practice settings while also strengthening scholarship and innovation. Capstones may have the ability to facilitate emergence of innovation and the adaptive capacity of students.

Complexity Lens and Healthcare Education

This study used complexity theory as a lens because this knowledge gap cannot be reduced to one factor and solved separately. As the findings show, there were several interrelationships, each influenced by the other as well as the context. Specifically, the themes were all interrelated and influenced by each other. Promoting KT in capstones entails understanding not only how capstones currently reflect KT concepts, but also how the capstone process is influenced by faculty perspectives and understanding what advantages and challenges exist to incorporating KT into capstones. To ensure successful implementation or incorporation of KT into capstones, we need to understand the systems and system change process and also the context. Simply stated, both the faculty and curriculum need to support the change in how capstones are developed and implemented. The many relationships between individuals, their context, and their influences must be understood (Bleakley & Cleland, 2015). Observing these influences through a complexity lens allowed me to interpret the relationships between and among the findings and themes. One cannot happen without the other, and this was not a linear process. The findings illuminate the dynamic complexities between the curriculum, faculty, university philosophy, and accreditation standards.

According to Bleakley and Cleland (2015), complex systems are made up of a number of interrelated components that can adapt to change and learn from their mistakes as a whole; as a result of their interactions, the system's components evolve as a whole. For example, the influences the standards have on the university and the influences the university has on the program and curriculum are interconnected and rely on each other to succeed. When near to chaos, complex adaptive systems will reorganize themselves through self-organization, adaptability, and innovation: self-organization is at the core of complex adaptive systems and learning (Bleakley & Cleland, 2015). Findings from this study suggest that with increased faculty understanding and curricular support, KT can be promoted in capstones. Implementing this change requires the whole system to engage.

Summary of Interpretation of Findings

The preceding discussion illustrated the multifaceted and complex relationship of KT reflection in capstones, faculty perceptions and understanding, as well as the curricular support required to promote KT in capstones. While limitations were evident in this study, the findings remain valuable and suggest areas for future research. Throughout this analysis and interpretation, it was clear how certain components of KT were reflected in some capstones. The faculty interviews also agreed with this notion.

Given that certain KT components were reflected and that faculty perceptions and the influence of the reflected components were congruent, it seems possible to incorporate other KT components. For example, faculty recognized the KT elements they already incorporated, such as conducting a thorough needs assessment to identify a problem, and the advantages of doing so. They also recognized the areas in which they fell short in using KT, such as lack of implementing the projects. Without

implementation, we miss opportunities for community impact and revealing the value of OT.

Faculty recognized numerous advantages the capstone offers to not only student learning and growth, but to the community and stakeholders it potentially serves. Stakeholder engagement is important in KT and serves to benefit the student by building communication and leadership skills as well as building trust and rapport at the capstone site. Conducting a thorough needs assessment earlier in the capstone process contributes to stakeholder engagement as well as identifying the knowledge gap. These are all valuable skills for an entry-level practitioner.

While varied degrees of understanding regarding KT were evident from faculty, they remained open-minded to learning about the concept and how it may benefit their capstone curriculum. They acknowledged the curriculum changes ensuing from educational standard revisions and discussed the various influences those changes had on their program, illustrating a complex system in action. Once faculty were introduced to the framework, they recognized the many benefits to incorporating it into the curriculum. Overall, these findings elucidate clear opportunities to promote KT in capstones with increased faculty awareness and curricular support.

Researcher Reflections

Initially, challenges from this study included locating capstone documents that were publicly accessible and met inclusion criteria. Additionally, the timing of the project was a stressor due to the pandemic. Universities and OTD programs were in a state of upheaval, transitioning from in-person to online learning. To ask OTD faculty to participate in a research project seemed nearly impossible. I was pleasantly surprised to

have as many participants as I did, including their willingness to have a follow-up interview. Another challenge was the immense learning curve required to become competent in a variety of technologies and the glitches they can bring. The iterative nature of qualitative research was both a blessing and curse but overall allowed me the flexibility to adapt as needed and learn from successes and failures.

As a novice researcher starting a doctoral program, I felt completely overwhelmed and terrified, yet excited at the possibilities of learning new ways of thinking. This study in particular became a passion after attending a conference on health profession educators. Although I have minimal experience as an academic teaching at the university level, I am an experienced clinical instructor. I facilitate the connection between didactics and real-world experiences, including professionalism, fostering opportunities for students to translate their knowledge and building the confidence required as a practitioner. These skills, along with support from advisors and mentors, allowed me to have the confidence to pursue this project.

Future Implications and Translation into Practice

The major findings presented in this study provide guidance for education, practice, and policy implications while offering direction for continued research. The capstone is an essential component of the OTD curriculum. It can serve as a launch pad for future practitioners to engage in research and scholarly projects while increasing their confidence, resilience, and creativity (Delbert et al., 2020; Provident & Lape, 2020; Root et al., 2018; Stephenson et al., 2020). KT has been described as the "synthesis, dissemination, exchange, and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the

health care system" (Straus et al., 2013, p. 2). For nearly two decades, OT scholars have encouraged the use of KT in OT research and practice (Corcoran, 2006; Juckett et al., 2019), and it has improved, yet a gap remains in OT education (Bennett et al., 2018).

The demands placed on entry-level OTD students, faculty, and curriculum are immense. The OT profession is growing at a fast pace, with hundreds of OT programs currently emerging. As a result of this growth, there will be an increasing demand for scholarly work that not only illustrates the profession's value, but provides valuable services to community partners and translates knowledge in the process. Currently, practicing clinicians are expected to translate knowledge to practice quickly; therefore, it seems logical to initiate this expectation in OT education to prepare students for their future.

While it is important and the KTA framework instructs us to adapt knowledge to a local context, it is also important to recognize system wide changes. Given every OTD program may design curriculum a bit differently, there are still educational standards which must be met. This provides a better opportunity to address system wide changes. This can begin by disseminating these results along with future study results to the accreditation council to advocate more explicit language in the standards regarding KT. For example, the recent accreditation standard changes suggest scholarly study that advances knowledge translation, however it is not a requirement. Although this study did not investigate how ACOTE defines KT, these findings do explain the various levels of understanding from faculty regarding KT, as well as the continued call for action from OT scholars to advance KT. Disseminating these findings to the accreditation council may help to inform revisions which would be more explicit regarding KT and scholarly

study. It seems reasonable with a lack of understanding regarding KT from OTD faculty, there could be missed opportunities to engage in scholarly study that advances KT. These findings help to illuminate faculty understanding of KT and how it can be integrated into curriculum.

One potential strategy to promote KT in capstones could include utilizing the KTA framework to incorporate KT into curriculum. After identifying the problem of decreased understanding and use of KT, it is important to engage the stakeholders such as the administrators and faculty. According to Graham and colleagues (2006), stakeholders need to be involved at every phase. Engaging stakeholders can then help to adapt this knowledge into the local context while assessing barriers and facilitators to incorporating KT in the curriculum. This would help to ensure adequate resources and supports are available to incorporate KT into curriculum. Since individual OTD programs may have different approaches in designing and teaching their courses, it is important KT fits into the appropriate courses. It is then essential to think about possible outcomes. This requires an approach to evaluate desired outcomes such as surveying faculty on their perceptions, specifically their knowledge about it, how they used it and perceived benefits of using KT. It is then key to monitor how the program continues to use KT. This can be accomplished by measuring changes in their understanding and practice. Lastly, it is important to ensure sustainability of using KT in their curriculum. Certainly, this is not all encompassing but just a simple example of how KT could be incorporated into curriculum by using the KTA framework.

Through curriculum support and faculty understanding, academia can promote KT in capstones, which offers opportunities for increased capstone project

implementation, which in turn helps to advance programs and community impact. Figure 5.1 illustrates what a potential process model could look like with KT in capstones. KT offers a systematic approach to translate knowledge. This has the potential to produce higher-quality capstone projects, which can lead to increased educational outcomes and increased research capacity of future OT practitioners. This of course warrants further research to measure community impact using Kirkpatrick's modified model of evaluation.

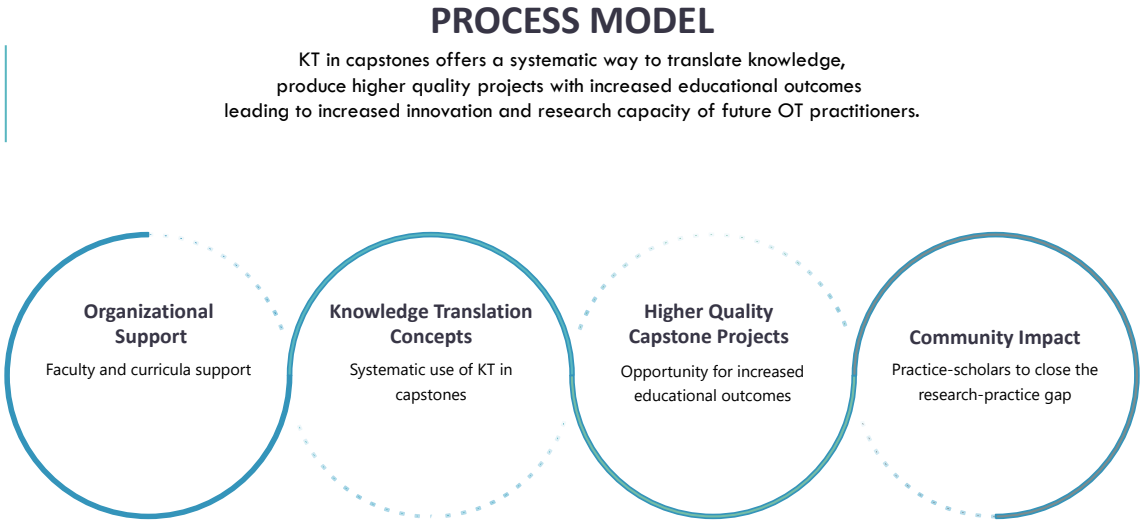
Translating these findings is key to initiating change. Specifically, these findings could begin to inform policy change. One approach to accomplishing this includes translating to the American Occupational Therapy Association (AOTA). For instance, offering interactive trainings at conferences and webinars. Trainings could include education on using KT terminology and language and introductions to KT frameworks. Additionally, AOTA could begin to offer KT as part of a theme in conferences to promote more KT use in research. AOTA should also consider collaborating with researchers who have specialized training in KT. Another approach to consider is highlighting student capstone projects which have an impact on the clients they serve. As the number of OTD programs continues to climb, it may be beneficial to showcase student projects which can help inspire novice and experienced practitioners and educators with a variety of possibilities.

Future research is warranted and could include triangulation of results from several studies with various stakeholders such as faculty, students and other OT professional leaders. This can include assessing capstones which were not publicly available along with interviewing those students whose capstones are assessed. One

approach could be appraising project rigor using a tool which would need to be developed. Student interviews could help to understand changes in levels of knowledge, understanding, behaviors and practice.

Another possible future study could include a pretest-postest design evaluating knowledge, understanding, behavior and practice with promoting KT in curriculum. This could involve multiple stakeholders such as students and faculty. Additionally, it may be beneficial to assess those capstone projects which are more community-centered to evaluate community outcomes using the modified Kirkpatrick educational outcome scale.

Figure 5.1
Process Model



It is imperative for educational programs to recognize the ever-evolving healthcare landscape and the complexities it brings. OTD programs are on the front lines of preparing effective and compassionate practitioners, but they must also prepare their students as practice-scholars. Embedding KT into OTD curriculums can initiate that process to ensure the highest standards of practice and research. The future is limitless, filled with innovative possibilities. By preparing future practitioners to use KT in research, practice, and beyond, we can set them up for success.

APPENDIX A:
Pilot Study Preliminary Findings

A small pilot study was used to initiate coding calibration. A pilot study is a miniature version of the main study to test components and processes of the main study (Arain et al., 2010). Three capstones were chosen from a publicly available repository for doctorate of occupational therapy (OTD) student capstones. A content analysis method was used to systematically review each capstone document. Initial lump coding was pre-determined or theory driven from the knowledge-to-action (KTA) framework. Theory-driven codes are codes that have been developed from existing theory or concepts (Decuir-Gunby et al., 2011). Initial preselected codes included the seven phases of the KTA framework action cycle: (1) identifying the problem; (2) adapting knowledge to local context; (3) assessing barriers to local context; (4) selecting, tailoring, and implementing interventions; (5) monitoring knowledge use; (6) evaluating outcomes; and (7) sustaining knowledge use (Graham et al., 2006).

To simplify the data collection process, only the first three capstones listed on a university website were used regardless of the title. The inclusion criterion was that the capstone was listed as an OTD capstone. The capstones were then read thoroughly, looking for patterns and trends to ascertain if knowledge translation (KT) was reflected in the documents. This was a productive first step to decide if the KTA framework was useful for predetermined codes. DeCuir-Gunby and colleagues (2011) suggested that theory-driven coding can be performed in three steps: "1) generate the code; 2) review and revise the code in context of the data; and 3) determine the reliability of coders and the code" (p. 141).

As the initial coding process began, memos were also generated, which then led to emergent codes, themes, and ideas for next steps. As this was an iterative process, new ideas and codes still appeared. Memo writing was initiated and continued as a process of reflecting on emerging results to support the trustworthiness of the analysis (Creswell & Poth, 2018). Initially, this first step was completed by hand, but committee members suggested using NVivo qualitative analysis software for further analysis. Capstones were then uploaded into the software program with the predetermined lump codes added. This exercise allowed another review of the data, which raised more curiosity. With advisor feedback, a codebook was determined to be beneficial. A codebook consists of a set of codes, their definitions, and examples (Decuir-Gunby et al., 2011). This was used as a guide to help analyze data from the interviews and capstone content. As organization of the data began, I used the software to begin linking memos with associated codes to account for my reflections, thoughts, and any potential bias.

Initial findings of the pilot study indicated that elements of KT were reflected throughout each of the three capstones. In particular, each capstone was able to identify a problem or knowledge-to-action gap. Barriers and facilitators to translating the knowledge were also evident in all three capstones. Identified barriers included lack of resources such as funds, time, and materials at both an individual level and institutional level. Facilitators to KT identified from the pilot included availability of existing resources at the individual and institutional levels and ongoing support from individuals and institutions. A review of the literature identified similar barriers and facilitators at the individual and institutional levels (Cramm et al., 2013; Govender & Mostert, 2019; Hitch et al., 2014). Additionally, these three capstones had elements of implementation

indicated by the identification of an intervention plan. One capstone had a dissemination plan to hold a multiday workshop and presented the plan to the site. Overall, these preliminary findings seemed to indicate that the capstones suggested a general understanding of KT. The capstones initiated KT strategies that were simple and accessible, most of which related to gaining insight into specific interventions in OT practice.

Although this pilot study showed only preliminary data analysis with broad categories, I was later able to organize, subcode, memo, and link emerging ideas and codes. I continued to use these strategies as my research progressed. I realized that data analysis is an iterative process and started the dissertation research looking forward to see what emerged as my knowledge and confidence with qualitative research increased.

Figure A.1

Treemap from Pilot Study Analysis

APPENDIX B:

EMAIL RECRUITMENT LETTER

Are you interested in how knowledge from capstones is translated into practice? Do you want to help increase the impact of capstones on the profession? This is the topic of my dissertation in the Translational Health Science program at George Washington University.

I am reaching out to a small number of selected OT faculty who are knowledgeable about OTD entry-level capstones. Would you be willing to participate in an interview as part of a study designed to ultimately develop recommendations for effectively translating knowledge generated in entry-level OTD capstones? I am conducting this research study as part of my dissertation in the PhD program in Translational Health Sciences at George Washington University.

If you agree, participation will require up to 60 minutes of your time in a personal confidential virtual interview with me. This interview can be separated into two 30-minute interviews if that is more convenient. The interview will take place at your convenience by WebEx and will be digitally recorded (audio only). The questions will focus on the capstone process and your suggestions for improving knowledge translation. The recording will be transcribed, but will identify you only by a study ID number. No one who works in your department or program will know if you have chosen to participate.

I hope you will take this opportunity to further advance research knowledge and capacity of future OT practitioners. Please let me know by Monday, August 31, 2020 if you can participate in an interview this fall. I'm happy to answer any questions you have, and thank you for considering my request.

IRB Exemption Approved
IRB# NCR202634, *"*Bridging the Knowledge-to-Action Gap: A Qualitative Description of the Use of Knowledge Translation in Entry-Level Doctor of Occupational Therapy Capstones*"*

M. Nicole Martino
mnicolemartino@gwu.edu
970-231-0556

APPENDIX C:

INFORMED CONSENT DOCUMENT

Bridging the Knowledge-to-Action Gap:
A Qualitative Description of the Use of Knowledge Translation
in Entry-Level Doctor of Occupational Therapy Capstones
IRB # NCR202634

Principal Investigator: Mary Corcoran, PhD, OTR/L, FAOTA
Student Investigator: M. Nicole Martino, MS, OTR/L
Co-investigator: Debra Herrmann, DHSc, MPH, PA-C

Key Information:

You are invited to take part in a qualitative research study that explores how knowledge translation is reflected in entry-level doctor of occupational therapy capstones, and how knowledge translation can be promoted in entry-level doctor of occupational therapy programs. We are specifically interested in learning about how capstones can help to bridge the knowledge-to-action gap.

This page provides important information to help you decide whether or not you want to participate in this study. Further details can be found on the next page. Ask the research team questions during the consent process, and use the contact information on this form to ask questions later.

WHAT IS THE PURPOSE, PROCEDURES, AND DURATION OF THIS STUDY?

The purpose of this study is to gain insight on how knowledge translation concepts may or may not be reflected within doctoral capstone projects and how knowledge translation could be promoted in capstones.

The total amount of time you will spend in this study is 1 hour for a one-on-one virtual, web-based interview. This interview will be audio recorded; however, no identifying information will be included in the recording. There may be a follow-up interview within 1 to 3 months after the initial interview. This follow-up interview will be no more than 1 hour.

WHAT ARE THE REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?

Reasons to participate include the potential to benefit by increased understanding of knowledge translation concepts and how they might benefit doctor of occupational therapy student capstones and overall curricular design with the doctoral experiential capstone, which could translate to improved patient care.

WHAT ARE THE REASONS YOU MIGHT NOT CHOOSE TO VOLUNTEER FOR THIS STUDY?

Reasons not to participate include the potential risk of loss of confidentiality. However, confidentiality will be assured through the use of a study ID number and the storage of any contact or demographic information in a password-protected computer in a private office accessible only to the student investigator. The records of this study will be kept private. In any published articles or presentations, we will not include any information that will make it possible to identify you as a subject. The study results will be reported in aggregate form. They will not include the name, OTD program, or geographic location of study participants. At the conclusion of the study, all data will be permanently destroyed.

DO YOU HAVE TO TAKE PART IN THIS STUDY?

You do not have to take part in this research. It is your choice whether or not you want to take part. You can agree to take part and later change your mind. If you choose not to take part or choose to stop taking part at any time, there will be no penalty to you or loss of benefits to which you are otherwise entitled.

WHAT IF YOU HAVE QUESTIONS OR CONCERNS?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team: Mary Corcoran, principal investigator, at (202) 994-8229, or Nicole Martino, student investigator, at (970) 231-0556.

This research is being overseen by an Institutional Review Board ("IRB"). You may talk to them at 202-994-2715 or via email at **ohrirb@gwu.edu** if:

- You have questions, concerns, or complaints that are not being answered by the research team or if you wish to talk to someone independent of the research team.
- You have questions about your rights as a research subject.

You are invited to take part in this study because of your knowledge and experience in OTD capstones. Taking part in this research is entirely voluntary. If you agree to take part in this study, please sign below:

_____ _____

Name Date

After you sign this Consent form, the research team will provide you with a copy. Please keep it in case you want to read it again or call someone about the study.

APPENDIX D:

INTERVIEW GUIDE

Time of interview:

Date:

Place:

Interviewer:

Interviewee (name and title):

Project Description: This purpose of this study is to describe how knowledge translation (KT) is reflected in entry-level OTD capstone projects and how KT can be promoted in entry-level OTD capstones.

Questions:

1. What is your role at your institution?
    a. Tell me more about what you do.
    b. How long have you been doing this?
2. How would you describe what a capstone project is (in your program)?
    a. Tell me more about that.
3. What are your expectations of a capstone?
    a. Please elaborate more about that.
    b. How are those expectations outlined for the learner?
    c. Can you talk a little about the outlined structure? (Follow-up question related to structure: Does the outline include issues, barriers, local context, needs assessment, etc.?) What is your expectation of students to complete or at least consider how they would evaluate their program/intervention?
4. How do you incorporate the D Standard (ensure that preparation for the capstone project includes a literature review, needs assessment, goals/objectives, and evaluation plan) into your capstone?
5. How do you prepare your students for the capstone?
6. What do you think is a challenge to creating and implementing capstone projects?
7. Does your program offer any support for capstone mentors? What does that look like (i.e., trainings, meetings, professional development opportunities)?
8. Do you encourage your students to choose a nontraditional or emerging OT practice area?

9. If you could make any changes to how the capstone project is conducted, what might that be?
10. What do you know about knowledge translation?
    a. How do you define it?
    b. Is this something you teach in your program?
    c. Tell me more about that.
11. Is knowledge translation connected to the capstone? If so, how is knowledge translation connected to the capstone?
12. Do you use any other type of KT model or framework to help guide the capstone?
13. When you look at the KTA framework, what aspects do you think are incorporated with your capstone projects? Can you provide an example?
14. What elements of the KTA framework are not represented in your capstone projects? Why do you think these elements are not incorporated?
15. Do you have any thoughts about how you might incorporate KT in your capstone projects? What barriers might you face while incorporating KT in your capstone projects?
16. What do you see as the advantages of incorporating KT in the capstone projects? What are the disadvantages?
17. How are the capstones disseminated?
    a. Were they disseminated in specific settings?
    b. How does it relate to KT?
    c. Did it go back to the practitioner? Was it a poster session, conference, symposium, etc.?
    d. Did you disseminate with students, such as in an article or presentation?
18. Do you have finished capstones publicly available?
19. Thank you for all that valuable information. Is there anything else you would like to add before we end?
    a. Do you have any questions for me?
    b. Is there anything I did not ask that you would like to tell me?

APPENDIX E:

CODEBOOK

(Please email for more information)

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