ABSTRACT

KORNEGAY, ELIZABETH HOPE COLLINS. Shaping Tomorrow's Dental Clinicians: An Instrumental Case Study on Dental Faculty's Vision to Prepare Future-Ready Dentists (Under the direction of Dr. Jayne Fleener).

Changes in healthcare continue to occur at drastic rates. The dental profession can leverage these pending changes by anticipating the future of dentistry and determining how best to prepare future dentists within this more expansive perspective of personal health promotion, development, and support. Dental faculty members represent critical stakeholders, ensuring dental students are prepared to work in volatile, uncertain, complex, and ambiguous environments and gain the knowledge, skills, and dispositions needed to become a dentist. Anticipating and planning the preparation and faculty development needs of dental faculty is necessary when considering dentistry's future. Through the lenses of futures studies, competing values framework, and neo-institutionalism, this instrumental case study explored the perceptions of United States dental faculty on the future of dentistry and the faculty preparation needed. The study used semi-structured interviews to identify trends, barriers, and opportunities for the future in dentistry, dental education, and dental faculty preparation.

The examination of dental faculty's visions of the future revealed six emergent themes: competing views within themselves, seeing dental professionals become healthcare providers, reforms with payments, advancements in technology, evolving roles of the dental team, and impacts of patient expectations. Faculty defined a future-ready dentist as adaptable, a lifelong learner, collaborative, and person-centered. They suggested that for the profession to accommodate changes of 21st century medical care and treatment in dentistry to occur, the dental profession will need to overcome patients' values and beliefs, insurance companies, the tradition of dentistry, and dentists' resistance to change.

The findings of this study suggest dental faculty need to be adaptable, curious, excellent communicators, and stay current within their field. The findings also suggest needed changes in educational methodology in dental training to prepare future-ready dentists. In addition to changes in dental education suggested by this study, additional supports for dental educators were suggested, including administrative and institutional support for professional development on educational methodology, and staying current within their perspective fields. To do this, they need administration to allow time and provide resources dedicated to ensuring faculty engage in professional development. This study contributes to the dental profession by anticipating the potential trends of dentistry, identifying ways to best prepare future practitioners, and exploring needed support for dental educators' professional development. The results of this study impact curricula for predoctoral programs and development opportunities for faculty to teach future clinicians.

Shaping Tomorrow's Dental Clinicians: An Instrumental Case Study on Dental Faculty's Vision to Prepare Future-Ready Dentists

by
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DEDICATION

I dedicate this dissertation to my son, Bennett.

May you pursue your dreams and passions.

And may you know how loved you are.

BIOGRAPHY

Elizabeth (Beth) Kornegay was born and raised in Kernersville, North Carolina, where she lived with her parents, two sisters, and brother. Beth began her undergraduate studies at North Carolina State University. She transferred to the University of North Carolina at Chapel Hill (UNC-CH) following her junior year and graduated with a Bachelor of Science in Dental Hygiene in 2014, followed by a Master of Science in Dental Hygiene Education in 2016 from UNC-CH. Currently, Beth is a Senior Manager, Clinical Strategy at Align Technology, Inc. and Adjunct Professor at UNC-CH. Before joining Align, Beth worked as an Assistant Professor at UNC-CH Adams School of Dentistry. Beth also previously worked as a clinical dental hygienist in private practice and clinical research settings. Beth enjoys spending time with family, friends, and dog, Sadie, reading, and traveling in her free time.

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CHAPTER 1: INTRODUCTION & BACKGROUND

Introduction

Healthcare is changing rapidly (Leape et al., 2009), creating opportunities and challenges for each healthcare field. As seen in other healthcare professions, the dental profession is at the precipice of drastic changes (Bailit, 2017; Bailit & Formicola, 2017; Formicola, 2017; Formicola et al., 2018; Kalkwarf et al., 2005; Weintraub, 2017). Oral health care is largely separated from overall health care, and the dental profession is separated from other healthcare fields (Bailit, 2017). Traditional roles are shifting in dentistry due to expanding roles of the professional, changes in delivery systems, technological advances, and social expectations (Bailit, 2017, Weintraub, 2017; Vujicic et al., 2016). There is movement to develop interdisciplinary care for patients and break down the barriers across medical fields and treatments (Bogetz et al., 2015; Leape et al., 2009).

Dental education needs to change to ensure students are prepared for future changes and meet dentistry's changing contexts (Formicola, 2017). Similarly, dental education providers need to develop different skills and expertise to adapt and creatively accommodate these changes in their teaching and professional lives. Through a systematic approach, there is a need to develop skills, propensities, and expertise to uncover and use the possible futures in ways that open dental education professionals to overcome barriers and seek opportunities to prepare and teach future practitioners.

The Terrain of Healthcare in the United States

Healthcare has evolved across the U.S. (Leape et al., 2009), particularly in the last few decades when changes to the healthcare industry generated a shift in treating clients from patients to consumers. Multiple organizations (e.g., Institute of Medicine), policymakers (e.g.,

Surgeon General), and critical reports (e.g., *HealthyPeople* published by the U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion) have created benchmarks to improve healthcare quality and address gaps in access to care (Davis, 2000; Healthy People 2030, n.d.*;* Office of the Surgeon General, 2003; U.S. Department of Health and Human Services, 2000). These benchmarks emphasize patient-centered care, interdisciplinary teamwork, evidence-based practice, continuous quality improvement, and information technology utilization in healthcare (Greiner & Knebel, 2003; Institute of Medicine, 2001). Healthcare roles are expanding and evolving to support the evolution of healthcare and new care models (Leape et al., 2009; O'Brien & Mattison, 2016). Healthcare providers continue to treat patients with increasingly complex medical conditions and engage in shared decision-making and person-centered care with other health professionals (Bogetz et al., 2015; Leape et al., 2009).

Technology is rapidly advancing (Anderson et al., 2021) and allows for enhanced delivery of patient care, providing tools for diagnosis, continuous monitoring, and treatment (Schoville & Titler, 2015). Leveraging technology may reduce human error while improving clinical outcomes and practice efficiency (Alotaibi & Federico, 2017). Technological advances include virtual and augmented reality, artificial intelligence, telehealth through virtual appointments, virtual consultations between healthcare providers, remote health monitoring, online patient portals, and electronic patient health records (Anderson et al., 2021; Mayo Clinic Staff, 2020). Experts forecast that patient engagement will continue to rise, and records will become more accessible, regulated, and standardized (Dugar, 2022). With these advancements and changes, healthcare professionals will likely need to shift their knowledge, values, beliefs, and dispositions on quality dental healthcare to meet these changes within the healthcare system (Bailit, 2017).

Dentistry within the Healthcare System

Oral health is increasingly becoming part of overall health, emphasizing interdisciplinary, holistic care (U.S. Department of Health and Human Services, 2021). Historically, oral health was separate from overall health, and the dental profession separate from all other healthcare fields (Bailit, 2017). However, there is a shift towards the inclusion of dentistry in overall health strategies. This shift is partly the result of two key reports: *HealthyPeople 2000* (Davis, 2000) and the 2000 Surgeon General Report *Oral Health in America: A Report of the Surgeon General* (Office of the Surgeon General, 2003; U.S. Department of Health and Human Services, 2000) where oral health became a priority for the first time. The evolution of the healthcare system towards an interdisciplinary and holistic focus requires attention from dental healthcare professionals (U.S. Department of Health and Human Services, 2021) to rethink dental education and practitioner skills expectations. The Oral Health Report released in January 2022 calls for the need to strengthen the dental workforce and address the training of future dental professionals (U.S. Department of Health and Human Services, 2021). To be prepared as a dental healthcare professional, one will need to develop different skills and expertise, allowing for the continued ability to adapt, innovate, and incorporate these changes (Formicola et al., 2018; Institute of Medicine, 2011).

Changes in Dental Education

Changes to dental education are necessary to ensure that programs prepare dental professionals for future healthcare environments and models (Bailit, 2017; Formicola, 2017; Weintraub, 2017). Calls for curriculum reform in dental education are not new. Early efforts published in the William Gies report in 1926 called for dental schools to be of equal level in education as medical schools with integrated instruction between clinical dentistry and medicine

(Gies, 1926). The latest calls for reform from the *Advancing Dental Education in the 21st Century*, launched by the American Dental Education Association (ADEA) in 2015, continue efforts to adapt the field to the times and explore ways to better prepare the next generation of dental professionals (Kalkwarf et al., 2005). This work details rapid changes to healthcare delivery systems, technological advances, funding shifts related to dental education, and an increased focus on behavioral sciences and interprofessional practice in the curriculum (Bailit, 2017; Bailit & Formicola, 2017; Formicola, 2017; Formicola et al., 2018; Kalkwarf et al., 2005; Weintraub, 2017). The *Advancing Dental Education in the 21st Century* publications further highlight how there will likely be a change in faculty qualifications to meet the changes in the healthcare system and practitioners' needs (Weintraub, 2017).

The *Advancing Dental Education in the 21st Century* publications also signify the necessity to determine the future of dentistry and what will be needed to prepare future practitioners (Bailit, 2017; Formicola, 2017; Weintraub, 2017). Experts in dental education predict specific trends, including a rapidly changing healthcare system with technological advances and a need to change the curriculum to prepare future learners. Scenario planning has begun in dental education to explore plausible alternative futures for dental education (Haden et al., 2021). Further research is necessary to expand on this approach and incorporate futures literacy strategies, methods, and dispositions to prepare for the future and ensure that graduates are ready for the evolving healthcare system.

Faculty Preparation in Dental Education

The future of dental education and the current curricular changes point to continuous change and adaptability, placing new and different demands on faculty. Rather than solely focusing on curriculum changes every 20 or 30 years, faculty must be adaptive and lifelong

learners with the expectation of continually changing the curriculum to meet the needs of their students. Faculty roles are becoming more interdisciplinary, and they need to leverage innovative approaches that better prepare their students for changing contexts (Bodinet, 2016).

Dental schools are increasingly investing in faculty development for *didactic teaching* and *clinical teaching* (Tricio et al., 2017; Zheng & Nadershahi, 2015; Zheng, 2021). However, dental education is reducing the number of full-time faculty while increasing the number of part-time faculty, which may lead to a decrease in program quality and increased responsibilities and burdens to the remaining faculty (Formicola, 2017). Further, most of the focus of dental education reform has focused predominantly on dental students and changes within the curriculum to prepare dental students for the current state of the workforce (Haden et al., 2021). Limited research has focused on staffing changes and the development of dental faculty who deliver dental education programs. Without adequate knowledge, skills, and mindset oriented to this preparation and the future of dental education trends, faculty will not be prepared to teach future oral health learners and prepare them for the evolving profession (Kornegay et al., 2022). Based on these gaps, research is needed to identify and forecast the potential futures and needs for *faculty development* to ensure faculty are prepared to teach futures-adaptive skills to learners.

Statement of the Problem

Healthcare is rapidly evolving across the U.S. (Leape et al., 2009), generating a need for health profession schools to respond with new curricula (Irby, 2009; Roth et al., 2014) and faculty professional development. The Institute of Medicine reports sparked discussion about the need for improvement within the nation's health and healthcare systems (Greiner & Knebel, 2003; Kohn et al., 2000; Institute of Medicine, 2001; Institute of Medicine, 2011; Institute of Medicine, 2013). These reports did not, however, provide strategies for addressing the

development needs of health profession faculty, in general, and dental educators, more specifically. The Surgeon General (Office of the Surgeon General, 2003) and the U.S. Department of Health and Human Services (Davis, 2000; Healthy People 2030, n.d.*;* U.S. Department of Health and Human Services, 2000) challenged traditional and existing healthcare practices and created benchmarks and advocated for the need to enhance quality of life. The new demands on the healthcare system and subsequent challenges to healthcare professionals will likely include shifting values, beliefs, and dispositions about quality dental healthcare among faculty, students, and the general population.

The project *Advancing Dental Education in the 21st Century* from the American Dental Education Association details rapid changes to healthcare delivery systems, technological advances, and funding shifts related to dental education (Bailit, 2017; Bailit & Formicola, 2017; Formicola, 2017; Formicola et al., 2018; Kalkwarf et al., 2005; Weintraub, 2017). Existing literature on the future trends in dental curricula predominately comes from expert opinion pieces (Bailit, 2017; Bailit & Formicola, 2017; Formicola, 2017; Formicola et al., 2018; Kalkwarf et al., 2005; Weintraub, 2017). Despite these expert opinion pieces, there is a shortage of research on how dental faculty perceives the profession's future. It is unclear how the existing stressors and social changes may impact dental faculty preparation in teaching future dental healthcare professionals and meeting society's needs for better dental healthcare outcomes. This is important because, without adequate knowledge, skills, mindset, and preparation oriented to the future of dental education trends and how dental faculty can anticipate and plan for these trends, predoctoral dental programs and faculty will not be prepared to teach future oral health learners and prepare them for the evolving profession. The findings from this study are

significant to dental clinicians, other healthcare providers, dental faculty members, policymakers, and the population.

Purpose and Guiding Research Questions

This qualitative instrumental case study explored how the dental profession may need to change in the future and how dental faculty can best anticipate those changes from the perspective of dental faculty. This study's conceptual and theoretical frameworks provided ways for capturing this expertise, understanding possible future strategies for supporting dental faculty, and situating dental faculty within the context of dental education and healthcare. The following three questions guide the overall structure of this study:

1. How do dental faculty envision the future of dentistry?
2. What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists?
3. What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists?

Significance of Study

This study is significant for future practice, policy, theory, and research in dental education. It is essential for practice because it provides insight into how dental faculty envision the profession changing and how dental education may need to change to support this. It also sheds light on how dentistry may change, and the knowledge and skills required for dental practitioners when providing patient care in the context of changes in healthcare delivery philosophies and expectations. This study advises dental schools on faculty development to prepare future clinicians. Faculty development efforts, specifically in teaching, need to evolve to

support teaching future dental practitioners, and this research provides a starting point in considering changes for these efforts.

Regarding policy, this study is essential in dental education and continuing education because it informs the dental education accrediting body, the *Commission on Dental Accreditation* (CODA). CODA oversees and ensures quality and improvement across dental education programs (CODA, 2021). Learning how practitioners may need to evolve impacts the dental curriculum, and ultimately CODA informs the minimal standards a dental program must have within its curriculum. Therefore, this case study informs future directions and considerations of CODA. This study also reflects the role state boards and legislation has on advancing the dental professional.

This study contributes to theory and research within the field as existing research focuses on past and current skills of dental professionals and the healthcare system's future, with evidence for future skills for the dental profession. It strengthens the research on the future of the dental profession and how to prepare for dental education by introducing the ideas of future-ready preparation based on a perspective of developing futures literacy among medical practitioners. Future research should include gaining the perspectives of current dental students, practicing *dentists*, administration of dental programs, and CODA as well as exploring how to develop futures literacy among medical professionals.

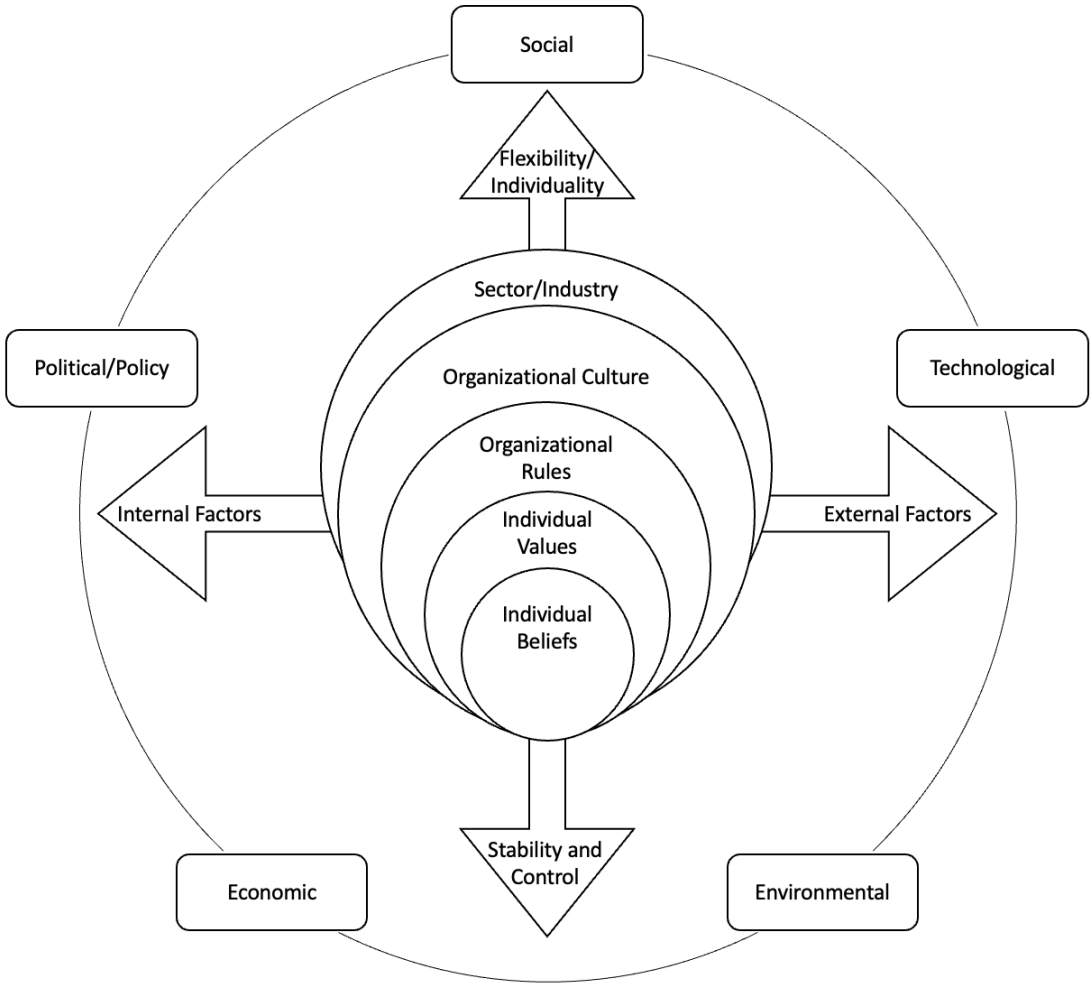
Conceptual and Theoretical Frameworks

This study is grounded in futures perspectives of *futures studies*, *competing values theory*, and *neo-institutionalism*. Anticipatory futures serve to understand data about dental professionals' thoughts about the future of dental education and the preparation of future-ready practitioners. The competing values framework deepens analyses by exploring underlying myths

and metaphors for social change that reveal conflict and dissonance within the organization (dental education) within a sector (healthcare education). Neo-institutionalism recognizes the multiple layers of influence from societal down to individual levels as the dental profession is explored and affected by driving forces (Figure 1.1).

Figure 1.1

Neo-institutionalism across social systems embedded within the tensions of the Competing Values Framework and Social Systems Influences



Note: I developed this figure based on how the three frameworks interplay and interconnect with one another.

Futures studies

Futures studies is a valid academic discipline (Inayatullah, 2012; Kristóf & Nováky, 2023; Motti, 2022; World Futures Studies Federation, 2023) that seeks to "discover and master the complex chains of cause and effect through conceptualization, systemic approach, and feedback loops" (Motti, 2022). Futures studies plans and anticipates multiple futures through various techniques and methods designed to identify possible, plausible, probable, and preferable futures (Bengston, 2018; Inayatullah, 2008; Inayatullah, 2012). Futures thinking is becoming more critical in times of rapid change. It is especially facilitative of changes occurring in *volatile, uncertain, complex, and ambiguous (VUCA)* environments and post-normal times (Sardar, 2010). *Social, Technological, Economic, Environmental, and Political (STEEP)* social dimensions are driving forces directly or indirectly influencing change and futures of individuals and organizations (van Duijne & Bishop, 2018) and are essential to consider while engaging in futures thinking with a systems perspective.

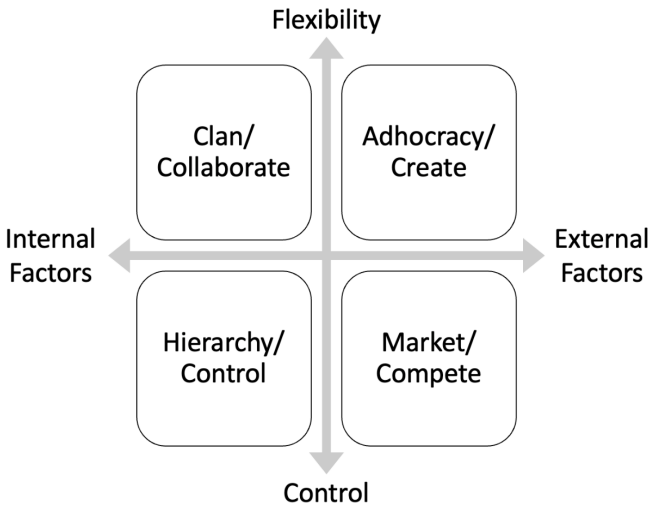
Anticipatory futures is an emerging field of study that explores how individuals and social institutions develop futures literacy skills, dispositions, and capacities (see, for example, Chan, 2021; Miller et al., 2018; Poli, 2017). The discipline of anticipation offers ideas and tools to conceive possible, probable, and desirable futures and to work with or use the futures (Inayatullah, 2008; Miller, 2018). Anticipation includes knowing and using the futures during the present-day (Rossel, 2010) to anticipate, invent, and create through optimization, contingency, and novelty (Miller et al., 2018). Anticipatory activities include deploying anticipatory systems and making aware of numerous systems and their influences on futures literacy and complexity (Miller et al., 2018). Complex problems or systems are from various causes that must be addressed as entire systems rather than individually (Miller & Poli, 2010).

Competing Values Framework

The competing values framework (CVF) examines how an organization or social system depends on its ability to navigate competing priorities (Quinn & Rohrbaugh, 1981) and interprets how individuals respond. CVF provides a way to diagnose and initiate change within an organizational culture, which can be challenging to describe as culture is typically invisible. CVF consists of tensions and harmony within an organization or sector. CVF compares organizations or social systems across two dimensions. The first dimension explores the adaptability-stability dynamic with the second dimension focusing on internal-external forces that impact or constrain change. The dynamics within and across these two dimensions expose competing values at all layers of an organization or social system that provide guidance for understanding and developing change strategies (Cameron and Quinn, 2011). (See Figure 1.2). For this study, CVF deepened analyses, revealing internal and external conflict and dissonance between the organization (dental education) and sector (healthcare).

Figure 1.2

OCAI Profiles (Cameron & Quinn, 2011)



Note: This figure is replicated from Cameron & Quinn, 2011

Neo-institutional Perspective

Neo-institutionalism connects the frameworks underpinning this study. Neo-institutionalism, also referred to as new institutionalism, is one approach to institutional theory seeking to understand organizational behavior influenced by internal and external forces, culture, and broader social forces that drive organizational change (Dimaggio, 1998; Hu et al., 2017). The neo-institutional perspective suggests that healthcare impacts various social systems, from individual beliefs to the sector or industry, which also is affected by multiple tensions, as noted in CVF. Neo-institutionalism explores the meso, macro, and microenvironments that impact change, across social institutions, institutional sectors, and particular organizations, down to individuals and their relationships within organizations (Thornton & Ocasio, 2008). For this study's purposes, neo-institutionalism provides the whole-systems perspective of dental practices and dental education within and across organizations, within the sectors of dental education and the medical professions, and in relation to and in interaction with other social systems such as healthcare, education, policy, technology, and societal expectations. Framing with neo-institutionalism will allow the exploration of perspectives about the future of dentistry and dental education. For this study, the individuals of interest are faculty members, the organization is dental education, and the sector is healthcare. These layers are influenced by societal, technological, economic, environmental, and political (STEEP) influences while also considering the competing values within dentistry (Figure 1.1).

Research Methodology

This study used an instrumental qualitative case study design to address the research questions. Qualitative research makes sense of meanings and provides thick, rich descriptions to understand a problem (Creswell & Poth, 2018) and how individuals interact with the world

(Merriam, 1995). Informed by postpositivists' ontological and epistemological beliefs, this study focused on dental faculty envisioning how the dental profession will change and how faculty must prepare.

Participants were selected from predoctoral dental education programs across the United States. I began with a list of individuals with whom I had a professional relationship at my previous institution to whom to reach out. I also used snowball sampling from faculty who participated by asking who else I should consider interviewing for this study. Participants provided faculty names and emails, who I then emailed with study information and requests for participation. I did not include any faculty at my previous institution.

Semi-structured interviews with open-ended questions were used to gather in-depth data from study participants (Rubin & Rubin, 2012). The issue of what kinds of futures skills and preparation were framed through interview questions grounded in anticipatory futures, competing values framework, and neo-institutional perspectives. Data were analyzed through a first cycle of coding using descriptive coding and simultaneous coding, followed by a second cycle of coding to develop themes (Miles et al., 2020). I used constant comparisons to look for similarities and differences between codes to create more robust themes and reach thematic saturation (Corbin & Strauss, 2014).

Definition of Terms

Clinical teaching. Teaching that occurs within a clinical space with a patient and focused on the application of knowledge and skills.

Commission on Dental Accreditation (CODA). The accrediting body for dental education programs includes predoctoral dental education, dental hygiene, and dental assisting programs (CODA, 2021).

Competing values framework (CVF). This framework examines how organizations navigate competing priorities that include internal and external factors along with the tension between flexibility and stability.

Dentist. A dentist, also known as a general dentist, performs various dental services and is the primary dental provider for all ages. Dentists evaluate, diagnose, prevent, and treat oral diseases. The education for a dentist is generally three or more years of undergraduate education and three to four years in a predoctoral program.

Didactic teaching. Teaching that are instructor led and occurring outside the clinical or laboratory space. Didactic teaching usually is in the form of a lecture prepared by the faculty member.

Futures Literacy. Futures literacy "is the skill that allows people to understand better the role of the future in what they see and do" (*Futures Literacy*, 2021).

Futures Skills. Futures skills are skills associated with successfully solving a complex problem in the future and an unknown context (Ehlers, 2020).

Futures studies. An interdisciplinary study rooted in sociology and policy sciences that examines the possible, plausible, probable, and preferable futures (Inayatullah, 2012).

Neo-institutionalism. An institutional theory recognizing multiple layers of influence including the sector, organization, institution, and individual. The theory seeks to understand organizational behavior influenced by individuals, external forces and organizations, and broader social forces (Hu et al., 2017; Scott, 2001).

Predoctoral Dental Education. Formal three to four-year curriculum and training leading to dental degree and license. After successful completion of the predoctoral program, students

will graduate with one of two general dental degrees: a DDS (Doctor of Dental Surgery) or DMD (Doctor of Medicine in Dentistry) (Delta Dental, n.d.).

Social, Technological, Economic, Environmental, Political (STEEP). Social dimensions that are driving forces influencing the futures of individuals and organizations.

Volatile, uncertain, complex, and ambiguous (VUCA) environments. The world is increasingly becoming volatile, uncertain, complex, and ambiguous (VUCA); therefore, quick fixes and simplistic explanations are no longer warranted to solve issues in micro, macro, and meso systems (Burrows & Gnad, 2020).

Weak signals. Weak signals are "signs that something new is occurring that could disrupt the system in unexpected ways" (Padbury, 2020).

Wild cards. Wild cards are events that are not likely to occur; however, if they do, they will have a high impact (Rockfellow, 1994). These events are surprising that can happen quickly and, if they occur, can have significant consequences that can significantly change and disrupt any plans an organization may have (Cornish, 2003).

Organization of Study

This is a five-chapter dissertation: introduction, literature review, methodology, findings, and discussion. Chapter one introduces the problem statement of the need to determine the anticipated future of dental education and how to prepare faculty for those changes. The chapter also includes a summary of the purpose, study significance, research questions, conceptual and theoretical frameworks, and definitions of terms.

Chapter two provides a literature review of the study. Chapter two begins with a discussion of the healthcare system and then narrows to dental healthcare and education. It will

then discuss faculty preparation within dental education. There is also an overview of the study's conceptual and theoretical frameworks.

Chapter three includes a discussion and rationale for the research methodology and design. It details the ethical considerations, trustworthiness, and the researcher's positionality. The chapter also describes the qualitative research methodology and analysis used. Chapter four provides the emergent themes and subthemes organized by research questions. Chapter five summarizes the conclusions from the study's findings and discusses the implications for future research and practice.

Chapter Summary

With society and healthcare rapidly changing, there is limited research on how dental faculty perceives the profession's future and what preparation they need to prepare future-ready dentists. Through an instrumental case study qualitative research design, this study explored the expertise of dental healthcare faculty on how dentistry will need to change in the future and how dental faculty will need to prepare. The results of this study contribute to dental education, faculty preparation, and futures studies literature. It provides insight into what dental faculty may need to prepare for the future of dentistry.

CHAPTER 2: LITERATURE REVIEW

Introduction

This study aimed to learn how dental faculty envision the future of dentistry and how to prepare for future dental professionals. Additionally, this study explored what skills and training may be needed and what support will be critical for dental education through anticipatory futures, competing values framework, and neo-institutionalism. I begin this chapter with a discussion of the healthcare system and the dental profession. I then discuss the current state of dental education and faculty preparation. Following, I discuss the conceptual and theoretical frameworks grounding this study.

Evolution of United States Healthcare

The historical trajectory of healthcare in the U.S. reflects continuous increases in spending and higher costs (Peter G Peterson Foundation, 2020). The rise in price is closely associated with the increase in chronic disease, lack of access to preventive care and adequate insurance coverage, and other non-medical drivers of health, especially among marginalized populations (Borsky et al., 2018; Call et al., 2014; Centers for Disease Control and Prevention, 2021). A significant factor contributing to these consequences is the fee-for-service payment system rewarding providers for the volume of services and incentivizing invasive procedures rather than valuing health outcomes and rewarding preventive procedures (Hobbs, 2017; Oakes & Radomski, 2021; Rubmic et al., 2014).

Healthcare has evolved rapidly across the U.S. (Leape et al., 2009), becoming an adaptive process involving personal and collective experiences. Multiple organizations, including the Surgeon General, *HealthyPeople*, and the Institute of Medicine, created benchmarks and advocated the need to enhance the quality of healthcare and promote the quality of life (Davis,

2000; Healthy People 2030, n.d.; Office of the Surgeon General, 2003; U.S. Department of Health and Human Services, 2000). The Institute of Medicine Committee on Quality of Health Care in America published multiple reports beginning in 2000 that sparked improvement within the nation's health and healthcare systems (Greiner & Knebel, 2003; Kohn et al., 2000; Institute of Medicine, 2001; Institute of Medicine, 2011). This evolving system includes collaboration and engagement of shared decision-making and person-centered care across interdisciplinary teams to treat patients with increasingly complex medical conditions (Bogetz et al., 2015; Leape et al., 2009; Price et al., 2015; Santana et al., 2018; Sharma et al., 2015).

Shifting from the fee-for-service payment system and attempting to become more patient-centered, value-based care is gaining traction across healthcare. Value-based care places healthcare on a trajectory of providing quality care, improving population health outcomes, and lowering the cost of care (Centers for Medicare & Medical Services, 2021a; Hoff et al., 2012; Kaufman et al., 2019; Teisberg et al., 2020; Trombley et al., 2019). Proponents of value-based care are working to integrate value-based care models such as the patient-centered medical home model (PCMH) and accountable care organizations (ACOs) across the healthcare system through coordinating care and payment (Arend et al., 2012; Hoff et al., 2012; Kaufman, 2019; Trombley et al., 2019). These models have shown success and are beginning to expand nationally as part of the Centers for Medicare & Medicaid Services Innovation Center's (CMMI) strategy for the next decade of value-based payment reform (Centers for Disease Control and Prevention, 2021b; Driving health system, 2021).

Further, the Institute for Healthcare Improvement developed an approach to inform care across healthcare systems called the Quadruple Aim. The Quadruple Aim suggests that health systems should be organized in interconnected dimensions: patient's experience of care,

population health, reducing costs, and care team well-being (Bodenheimer & Sinksky, 2014). While beginning to gain traction, dentistry is lagging compared to their medical colleagues in considering value-based care models and adopting the Quadruple Aim (Blue & Riggs, 2016; McLeod et al., 2022).

Technology is quickly advancing, impacting healthcare preparation and practice changes. When forecasting life in 2025 following the COVID-19 pandemic, 915 researchers, policy leaders, innovators, and others widely consider that technology will deepen within the population and people will increasingly rely on technology for work, healthcare, education, and social interaction (Anderson et al., 2021). Leveraging technology advancements may reduce clinician error, improve clinical outcomes and practice efficiencies, facilitate coordination of care (Alotaibi & Federico, 2017), and provide a way to access information quicker (Anderson et al., 2021). Further, healthcare technology allows for enhanced delivery of patient care, providing tools for diagnosis, continuous monitoring, and treatment (Schoville & Titler, 2015). Experts forecast that patient engagement will continue to rise, and records will become more accessible, regulated, and standardized (Dugar, 2022). Roughly 66% of the population searches the internet to find information on medical issues (Dugar, 2022). Misinformation will continue to grow with accessibility to an extensive amount of information through search engines (Anderson et al., 2021).

Virtual reality and avatars will increasingly augment health and be integrated into training for providers, patients, and caregivers (O'Brien & Mattison, 2016). Wearable technology is emerging to help improve patient well-being, allowing for real-time data and improving the accuracy of health information, fostering healthier behaviors and improved health conditions (Cheung et al., 2019). Electronic health records continue to evolve and allow patients

to access their records on an electronic device. Telehealth continues to expand and emerge as it enables access to healthcare services and manages healthcare remotely through digital information and community technologies (Mayo Clinic Staff, 2020). Forms of telehealth include virtual appointments with healthcare providers, virtual consultations between healthcare providers, remote health monitoring, and online patient portals (Mayo Clinic Staff, 2020).

Roles and responsibilities for healthcare providers are also emerging and expanding to support the advances and evolution of healthcare and the new care models (Leape et al., 2009; O'Brien & Mattison, 2016). The roles include Community Connectors, Medical Virtualists, Nocturnists, Cancer Immunologists, and Clinical Informatics (Bass, 2018; O'Brien & Mattison, 2016). New roles will continue to develop as healthcare continues to evolve. While engaging in forecasting and considering future needs will not forecast all future positions and trends in healthcare, it can help stakeholders and the healthcare system plan and anticipate changes.

These changes in the healthcare system impact all healthcare fields, including dentistry. The new demands on the healthcare system and subsequent challenges to healthcare professionals will likely include shifting knowledge, values, beliefs, and dispositions on quality dental healthcare (Bailit, 2017).

Past and Current State of the Dental Profession

Historically, oral has been separated from overall health in healthcare discussions, with the dental profession independent from all other healthcare fields (Bailit, 2017). Over the past couple of decades, oral health is increasingly becoming part of overall health, emphasizing interdisciplinary, holistic care. This shift is partly attributed to priorities set in *HealthyPeople 2000* (Davis, 2000) and the 2000 Surgeon General Report (Office of the Surgeon General, 2003;

U.S. Department of Health and Human Services, 2000), where oral health was a national priority for the first time.

The Dental Workforce

As of 2020, there were 201,117 practicing general dentists, translating to 61 dentists per 100,000 population in the United States (Munson & Vujicic, 2021). The projected growth rate between 2020 to 2040 for the number of dentists per capita is 10.4% (Munson & Vujicic, 2021). Dentists are saturated in urban areas while undersaturated in rural areas (Wolf & Campus, 2021). Presently, the Health Resources and Services Administration (HRSA) estimates that 70 million people live in a United States health workforce shortage area, creating a need for 11,911 dentists (Health Workforce Shortage Areas, 2022).

The dental profession consists of various roles based on responsibilities, the scope of practice, and the education of the position. The dental workforce comprises dentists, dental hygienists, dental assistants, specialists, and other professionals. A general dentist, commonly known as a dentist, performs a range of dental services and is the primary dental care provider for all ages. Dentists evaluate, diagnose, prevent, and treat oral diseases. The education for a dentist is generally three or more years of undergraduate education and three to four years in a predoctoral program. Upon graduation, dentists typically begin practicing dentistry or attend post-graduate training education to gain more experience as general dentists or become specialists. In total, there are 12 specialties recognized by the American Dental Association (ADA): pediatric dentist, orthodontist, periodontist, endodontist, oral and maxillofacial surgeon, prosthodontist, oral pathologist, oral maxillofacial radiologist, dental anesthesiologist, oral medicine specialist, orofacial pain specialist, and dental public health specialist (Delta Dental, n.d.). Dentists often refer patients to a dental specialist depending on what treatment is needed.

Other roles in dentistry in the United States include dental hygienists, dental assistants, and dental laboratory technicians ("Dental team careers," n.d.). Dental hygienists perform preventive procedures for patients and educate patients on best practices for maintaining oral health. Dental assistants assist the dentist during treatment in the office and help patients feel comfortable during dental treatment. Dental laboratory technicians work with materials to create tooth replacements for dentists. Multiple states also have midlevel providers (dental therapists, advanced dental hygiene practitioners, or community dental health coordinators (CDHC)) to address access to care issues ("Dental team careers," n.d.).

Changes to Dental Practice

Advancements in society and oral health expectations, technology, dental practice models, and reimbursement models in the dental profession and society are impacting the practice of dentistry. As universal healthcare evolves and dentistry becomes integrated into the healthcare system (Rozier et al., 2017; Weintraub, 2017), society may present stressors to the existing dental healthcare profession. The changes to dentistry will likely warrant reorganizing how dentistry functions as a profession and how dentists practice (Wolf & Campus, 2021). Further, if healthcare policies and reimbursement models continue to evolve, the dental profession and dentists will need to determine how to respond and navigate this into practice.

Focus and Quality of Care

The dental profession faces changes to oral health outcomes and expectations. Presently common dental procedures focus on esthetics and preserving teeth compared to traditional dentistry of extracting a tooth when a dental problem occurs. Society now values esthetics seeking straight and white teeth (Weintraub, 2017). Further, prevention like water fluoridation

efforts is also on a continued rise. These efforts have increased the longevity of teeth within the population (Weintraub, 2017).

Patients are beginning to have higher expectations and be more involved in their care. They desire good value at a reasonable cost for dental treatment (Weintraub, 2017). In line with societal expectations, the Institute of Medicine urges health professions to shift towards evidence-based, person-centered care (Field, 1995). Dentistry has quickly adopted evidence-based approaches but are slower adopters of person-centered care (Apelian et al., 2020). This slow adoption of person-centered care may be attributed to dentists feeling poorly prepared to engage with patients and possible relational issues, not wanting to affect the quality of care, and concerns over legal issues, as reflected in one qualitative study in Canada (Apelian et al., 2020). While a slower adoption, dental professionals have begun to develop person-centered care models allowing for shared power and decision-making between dentists and patients in 2014 (Price et al., 2015; Santana et al., 2018; Sharma et al., 2015).

Public health leaders emphasize a need to provide care to underserved communities and address access to care issues (Rozier et al., 2017; Sinkford, 2020; Weintraub, 2017). It is expected that people in low-income and underserved populations will continue to have a higher incidence of oral and untreated disease (Rozier et al., 2017). It is also projected that the population needing and using dental services will continue to change as patients age, becoming more medically complex and racially, ethnically, and economically more diverse (Weintraub, 2017). While controversial in dentistry, several states are responding with legislation changes to expand roles for dental hygienists or include midlevel providers such as dental therapists (Sinkford, 2020).

Technological Advancements

The technological advancements in healthcare translate to innovations seen in the dental profession. Clinicians are utilizing 3D imaging and printing to fabricate appliances to deliver to patients. Newer treatments like tissue regeneration are creating a variety of new treatments for clinicians to offer to their patients (Weintraub, 2017). Telehealth is becoming increasingly prominent in dentistry, mainly serving communities with limited access to care. Another change includes evolving electronic health records with increased health applications and patients readily receiving their health information and comparing treatment options across different providers (Weintraub, 2017).

Dental Practice Models

Presently, dentists practicing clinically may own their practice either as a solo practice owner or multi-doctor practice, associate in a multi-doctor office, or practitioner in a group practice or corporate-owned dental support (or service) organization (DSO). Dental practice models have evolved from solo practice models to multi-doctor, multi-site practices (Guay et al., 2014; Wolf & Campus, 2021) or corporate-owned DSOs (Weintraub, 2017). Historically, the solo practice model was the most common route for dentists to practice clinically while owning their own business. There is a steady decline from 65% of dentists working as solo practitioners to 46% in 2019 (American Dental Association, 2021; Sinkford, 2020). Age is considered a factor in the decline of solo practitioners, with 25% of dentists under 35 being in traditional solo practice (American Dental Association, 2021). Findings from an ADEA survey of 2853 final-year dental students in 2022 reflect this shift finding that of the 53% of respondents planning to enter private practice, 61% planned to join group practices (61%) and 26% solo practice (Istrate et al., 2022). More dentists are opting to become an associate of a DSO, allowing them to focus

solely on patient care and not worry about the administrative responsibilities of owning their own practice.

Reimbursement Models

Reimbursement models and shifts in universal healthcare policies also drive dental practice changes. Presently, dental insurance is separate from health insurance. Further, federal health insurance programs like Medicare for people 65 or older or with a disability do not include dental services. Medicaid for people with low income includes limited coverage of dental services. Efforts are being made to expand dental services and be reimbursed in both programs (Weintraub, 2017). Even with the efforts to expand dental services in these programs, dentists and dental practice owners ultimately elect what insurance they will accept from patients. For example, only 38% of dentists accept Medicaid, limiting access to dental providers for patients ("The oral health care system," 2018). Nasseh et al. (2022) estimate that 48% of dentists treating at least 100 patients with Medicaid are in high-poverty areas, and 29% work in practices of 11 or more dentists. Whereas 18% of dentists do not accept Medicaid practice in high-poverty areas, and 11% work in practices of 11 or more dentists (Nasseh et al., 2022).

The low number of dentists accepting Medicaid is likely due to the limited services Medicaid covers, the length of time between treatment and reimbursement, and the low reimbursement from Medicaid. Nationally, reimbursement for Medicaid is, on average, 61.4% of dental services reimbursed by private insurance for children in 2020 ("Reimbursement Rates," 2021). Further, patients have a limited understanding of the dental services provided by insurance. For example, an estimated 31.3% of people with Medicaid were not sure of the dental benefits included with Medicaid, and 37.7% did not understand what the benefits were ("Driving health system transformation," 2021).

Current and Future Directions of Dental Education

Predoctoral dental education programs provide the education to ensure dentists graduate with the necessary knowledge, skills, and attitudes to practice dentistry. While each program implements its own curriculum, dental education can serve as a starting point to ensure graduates are ready to respond to changes within healthcare.

The Landscape of Dental Education

As of 2022, there are 70 accredited dental schools in the United States. There were 26,228 enrolled students and 6,665 graduates in the 2021-2022 academic year ("Dental education," n.d.). There is no standard curriculum for predoctoral dental schools, as each program develops and implements its curriculum. However, each program must follow standards set by the dental accrediting body, the Commission of Dental Accreditation (CODA) (CODA, 2021), to maintain accreditation. Predoctoral programs lead to a degree in Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD). Programs must include an equivalent of four academic years of instruction and include didactic, behavioral, and clinical instruction (CODA, 2021).

Dental education institutions have shifted their programs to incorporate problem- and competency-based learning (Elangovan et al., 2016). Following medical education's direction, dental education is assessing and developing assessment frameworks, like entrustable professional activities (EPAs). EPAs are designed to assess higher levels of competence in a clinical setting where a faculty determines their trust in a student to know and perform a particular skill with reliability, integrity, and agency. The success of assessments within dental education is dependent on the expertise of dental faculty as they are the ones to make decisions of entrustment and competence while giving feedback on students' work (Tonni et al., 2020).

Dental schools presently use various methods to assess competencies to meet CODA standards, complement competency-based education, and measure the development of knowledge, skills, and attitudes (Tonni et al., 2020). Based on a survey from the ADA Health Policy Institute on the dental school curriculum, all dental schools (100%) use written assessments, simulations, self-assessment, and faculty assessment by observation to assess competency. Dental schools also use independent assessments (86.4% of dental schools), objective structured clinical examinations (OSCE) (97%), critically appraised topic summaries (CATS) and patient/problem, intervention, comparison, outcome (PICO) questions (80.3%), and work samples including portfolios (95.5%) (ADA Health Policy Institute, 2020). Institutions are identifying methods to share how students are doing based on programmatic and institutional goals and disseminating information to the public about how students perform based on programmatic and institutional goals (Wehlburg, 2006).

Practice Readiness of Dental Students

The Oral Health Report released in January 2022 calls for the need to strengthen the dental workforce and address the training of future dental professionals (U.S. Department of Health and Human Services, 2021). With the rapid changes in the healthcare system, dentistry, and dental education, there is a need to balance competing priorities to meet the needs of individuals, including the patients, populations, employees, administrators, organizations, and the healthcare system at large (Rosko & Mutter, 2011). Practitioners will need to have the ability to adapt to these changes to ensure the organization and system can continue to progress and evolve as necessary (Brinkley, 2013).

ADEA surveyed 2022 graduating students from U.S. dental schools to assess their perceived readiness to practice. From that survey, 99% of participants agreed they felt most

ready about “understanding the ethical and professional values that are expected of the profession.” Only 60% agreed on being prepared to “manage a successful business” (Istrate et al., 2022). Even while graduates feel ready to practice, this contrasts with dental faculty and experts' opinions, where there is a concern as to whether graduates are ready and have the qualities to enter the workforce following graduation (Sorcinelli & Austin, 2006). Changes to accreditation standards, educational programs, and the roles and qualities of a dentist continuously evolve and occur.

Recommendations for Dental Education

Calls for curriculum reform in dental education can be traced to the 20th century, with the William Gies report published in 1926 (Field, 1995). Continuing this trajectory of calls for reform is the most recent project, *Advancing Dental Education in the 21st Century,* launched by the American Dental Education Association (ADEA) in 2015 (Kalkwarf et al., 2005). The project deliverables consist of six executive summaries and 37 background articles published in 2017 in the *Journal of Dental Education* (Formicola, 2017). This work details rapid changes to healthcare delivery systems, technological advances, personalized healthcare experiences, and funding shifts related to dental education (Bailit, 2017; Bailit & Formicola, 2017; Formicola, 2017; Formicola et al., 2018; Kalkwarf et al., 2005; Weintraub, 2017). The Institute of Medicine Committee on Quality of Health Care in America reinforces this suggesting five elements as a vision for all educational healthcare programs: patient-centered care, interdisciplinary teamwork, evidence-based practice, continuous quality improvement, and information technology utilization (Greiner & Knebel, 2003; Institute of Medicine, 2001). Even though oral health is becoming part of overall health, medical and dental education remain disjointed with a growing disconnect between the two health professional education programs (Glick et al., 2012). Because of this

disconnect, Glick et al. (2012) suggest that educational programs should emphasize interprofessional education and practice to equip dental students to work across professions and advocate for their patients' health (Glick et al., 2012).

Over a decade ago, the FDI World Dental Federation recommended that dental education programs focus on public health issues, critical thinking, communication across professions, integration of technology for treatment and prevention, and advocacy for patients and lifelong learning (Glick et al., 2012). These recommendations are still relevant. Editorials and faculty focus groups highlight that dental students need strong clinical training in evidence-based practice and community advocacy (Weintraub, 2017). Focus group findings from one cohort of faculty revealed that the dental program should create a curriculum preparing future graduates with formalized training in advocacy and leadership. The curriculum should also integrate biomedical, clinical, and behavioral sciences with increased student exposure to evidence-based practices while considering critical thinking and patient advocacy (Kornegay et al., 2021). Additionally, the Macy study emphasized clinical care of diverse community-based populations using evidence-based care as an essential component of dental student education (Formicola et al., 2008). There is an opportunity to expand on this research to prepare for the future and ensure graduates are ready for the evolving healthcare system.

Previous scholarship predominately focuses on past and current changes in dental education; however, current research does not anticipate and consider the future state. Scholarship in the changes to prepare for the future of dental education is predominately from experts with minimal empirical research in the area. Experts in dental education predict specific trends, including a rapidly changing healthcare system with technological advances and a need to change the curriculum to prepare future learners. Practitioners will need to adapt to the changing

world and the needs of the healthcare system and higher education. Glick et al. (2012) recommend developing global standards to educate and train the dental workforce to ensure optimal oral health across communities. Further research is necessary to substantiate these ideas and thoughts (Glick et al., 2012). While dental accreditation standards can help drive these changes to ensure standardization across programs (Sinkford, 2020), dental faculty will be the ultimate drivers of change as they prepare future dentists and carry out clinical and didactic teaching. The limited research and the role faculty have warranted the need for this study.

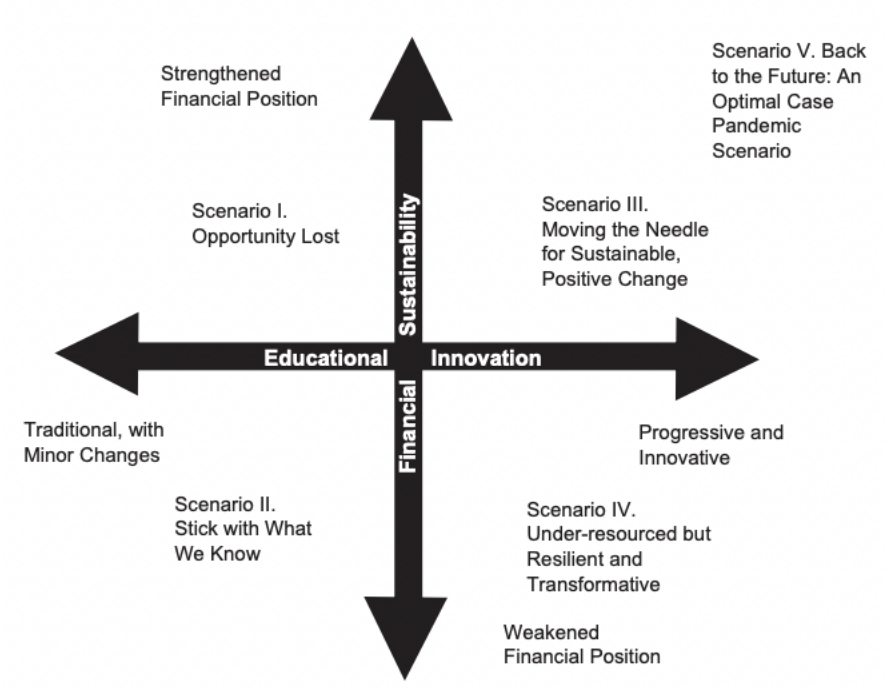
American Dental Education Association Response to Change

Healthcare fields have an opportunity to prepare and forecast the future of their profession and the healthcare system. While there are wild cards (e.g., the COVID-19 pandemic) and weak signals that people cannot predict, anticipating the future can help programs and organizations prepare and predict to ensure practitioners are ready to practice in an evolving system. The American Dental Education Association (ADEA), the only United States national organization for academic dentistry, has started scenario planning to explore plausible alternative futures for dental education due to the COVID-19 pandemic (Haden et al., 2021).

Participants in the ADEA Leadership Institute participated in a seven-step process to develop five scenarios along with their impacts for 2026 (Figure 2.1). The seven-step process includes (1) an environmental scan, (2) a SWOT (strengths, weaknesses, opportunities, and threats) analysis, (3) a steering committee formation, (4) strategic priority area identification, (5) selection of two critical uncertainties, (6) scenario construction by creating a 2X2 matrix which includes key drivers from step 5 of financial stability and educational innovation, and (7) feedback from the 2021 ADEA annual session symposium.

Figure 2.1.

Five scenarios for dental education in 2026



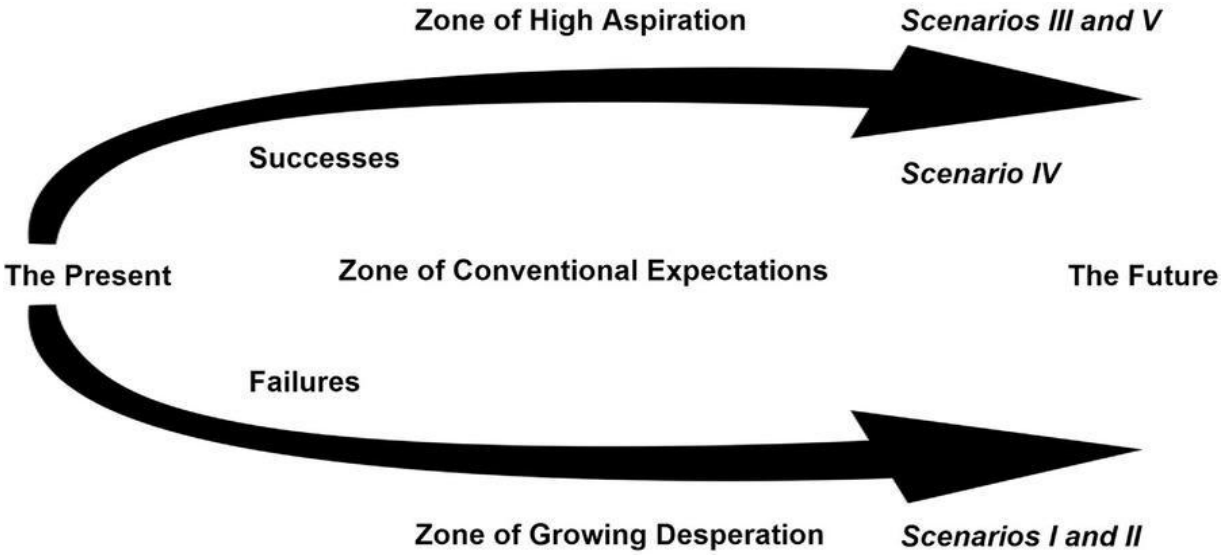
Note: Haden, N. K., Bell, K. P., Bottino, M. C., Haley, C. M., Quick, K. K., & Yelick, P. C. (2021). Dental education 2026: A scenario exploration. *Journal of Dental Education*, 86, 343-351. https://doi.org/10.1002/jdd.12838

Based on those seven steps, participants created five scenarios to propose what may occur if there is a strengthened financial position with no educational innovation (Scenario I: Opportunity Lost) (Quick et al., 2021), a weakened financial position with no educational innovation (Scenario II: Consist of what we know) (Haley et al., 2021), a strengthened financial position with innovation (Scenario III: Moving the needle for sustainable, positive change) (Bell et al., 2021), a weakened financial position with educational innovation (Scenario IV: Under-resourced but resilient and transformative) (Botta et al., 2021), and if another pandemic occurred (Scenario V: Back to the future: An optimal case pandemic scenario) (Brownstein et al., 2021). Haden et al. (2021) encourage programs to implement scenario planning into their programs to

ensure the continuation of strategic functions, track signals of a plausible future, and create contingency plans to ensure the program is agile and prepared. These scenarios are further described through three different aspirational futures: the zone of conventional expectation, the zone of growing desperation, and the zone of high aspiration. (Figure 2.2).

Figure 2.2.

Scenarios from ADEA Leadership Institute integrated into aspirational futures



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Faculty in Dental Education

Dental faculty members can be drivers of change within dental education. They represent critical stakeholders to ensure dental students are prepared and ascertain the knowledge, skills, and dispositions necessary to be a dentist. With the evolving nature of healthcare and the evolution of dental practice toward interprofessional, person-centered, and evidence-based care, faculty qualifications will likely change to meet the changes in the healthcare system and

practitioners (Weintraub, 2017). Anticipating and planning the preparation and faculty development needs of dental faculty is necessary when considering dentistry's future.

Faculty Development Defined

Faculty development offers opportunities to strengthen individual faculty's knowledge, skills, and abilities designed to support faculty in their roles in higher education and improve faculty members' performance in teaching, research, leadership, and administration (Steinert et al., 2006). Faculty development is a broad range of informal and formal mentorship, activities, and programs (Sorcinelli & Austin, 2006). Faculty development efforts often include in-person, hybrid, and online methods provided by individual universities or schools, professional associations, private organizations, and multiple other agencies (Austin & Sorcinelli, 2013).

Higher education institutions offer faculty development initiatives through four possible structures: (1) the central model, (2) the dispersed model, (3) the mixed model, and (4) the integrated model (Hicks, 1999). The central model is the most used, with 54% of faculty members and administrators reporting that their university has a centralized unit with dedicated faculty support (Sorcinelli et al., 2006). Central models consist of a central unit within the university or college responsible for planning and implementing campus-wide faculty development programs (Lewis, 2010). The dispersed model is where the faculty development unit is at the departmental levels of the school. Policies are often created to encourage departments to have faculty development programs within their units (Lewis, 2010). The mixed model is when a school has central and departmental faculty development units, often with no coordination between the central and departmental units (Lewis, 2010). The integrated model incorporates the elements of the mixed model while providing a well-rounded, robust approach

to faculty development. This model can be challenging to achieve but effective when done appropriately (Lewis, 2010).

Challenges for Dental Education and Dental Faculty Members

Across academia and health profession education, programs are challenged with recruiting and sustaining faculty. Faculty are increasingly dealing with complex, demanding, and evolving roles and responsibilities with fewer resources and less time (Sorcinelli & Austin, 2006). Faculty and programs face modifications to accreditation standards and decreasing budgets and funding (Oullette, 2010). Even with complex and demanding roles, dental faculty members often come into academia from clinical practice or advanced graduate programs with little to no academic experience (American Dental Education Association, 2019). According to a survey from the American Dental Education Association (2019), 48% of dental faculty came directly from private practice and 12% came from an advanced graduate program. Faculty with little to no educational background or experience acquire training typically through faculty development programs (Graham et al., 2012). Another concern is whether graduates are ready and have the qualities to enter the workforce following graduation (Sorcinelli & Austin, 2006). This potential lack of readiness further emphasizes the need for faculty members to learn and become skilled in teaching and assessing student learning outcomes (Oullette, 2010; Sorcinelli & Austin, 2006).

In one survey of 532 participants in medical education, 42% indicated that they were "seriously considering leaving academic medicine in the next five years" (Lowenstein et al., 2007). This was attributed to faculty struggling to balance work and personal life and a lack of academic community, faculty development, and regular evaluation of academic progress (Lowenstein et al., 2007). There is a national shortage of dental faculty across the United States,

and dental education is challenged with recruiting and sustaining faculty members (American Dental Education Association, 2019). Predoctoral dental programs need faculty members nationwide to meet these demands and supplement faculty retiring, leaving, or transitioning into new roles. Faculty development efforts are warranted to support professionals entering academia, address the challenges of retaining and sustaining faculty, and ensure that teaching faculty are prepared to educate future dental professionals.

Roles and Competencies of Dental Faculty Members

Dental faculty roles range from teaching, research, service, administration, advocacy, and clinical (Hand, 2006; Sherbino et al., 2014). Dental faculty are often required to continue providing patient care to maintain their skills (Skeff et al., 1997) while ensuring that scholarship and service are maintained. As clinical teachers, dental faculty are expected to ensure dental students have the knowledge, skills, and attitudes to practice dentistry while using a variety of teaching methods (e.g., lectures, small groups, and one-on-one teaching) and teaching in different settings (e.g., lecture hall or a clinic with patients).

Competencies and specifying roles for dental faculty is one opportunity to help faculty in their roles. Medical education has begun considering the ‘competencies’ for faculty needs. Harris et al. (2007) developed a process for competencies for academic medical faculty members through an expert advisory group of the Faculty Futures Initiatives. The core competencies include leadership, administration, teaching, research, medical informatics, care management, and multiculturism. While these competencies do not account for the anticipated futures of faculty, they compare to elements of futures work, including competencies around technology, reflective practice, cultural awareness, ethical underpinnings, and future learning activities (Harris et al., 2007).

In dental education, European researchers are leading the efforts to develop roles and define competencies. A Delphi study of 39 European dental faculty and 17 dental students propose curriculum content for faculty development (Chuenjitwongsa et al., 2018). Findings reveal that faculty should have competence in educational theories and methods, assessment, feedback, curriculum and evaluation, healthcare system, and professionalism. Chuenjitwongsa et al. (2018) state that dental educations only need to be competent in areas related to their specific roles. Four core domains were suggested as essential for teaching roles and what all educators must be competent in (1) educational principles, (2) educational practice in dentistry, (3) curriculum, quality, and improvement, and (4) educational professionalism (Chuenjitwongsa et al., 2018).

Another example in Europe is from the UK Committee of Postgraduate Dental Deans and Directors (COPDEND) developed the COPDEND Guidelines for Dental Education to determine the knowledge, values, and behaviors expected of dental educators (COPDEND UK, 2013). The guidelines were based on responses to an online questionnaire from 400 dental educators and providers and discussions with dental school deans and directors. Of note, teaching and learning and assessing the learner were domains found, and standards included continuously improving one's educational practice, enhancing patient care through dental education, modeling optimal professional behavior, being learner-centered, and supporting the education of colleagues (COPDEND UK, 2013). As Chuenjitwongsa et al. (2018) suggested, only some standards may be relevant depending on a dental educator's role. The competencies and standards recommended by medical and dental education bolster the need for preparing faculty to teach these competencies, and defining these competencies can help outline and plan what elements should be in faculty development initiatives.

Developing and Preparing Faculty in Dental Education

Dental schools are increasingly investing in faculty development for teaching (Tricio et al., 2017; Zheng & Nadershahi, 2015; Zheng, 2021). Faculty development can promote curricular change and create an educational environment that encourages innovation (Steinert, 2012). However, the reduction in full-time faculty, increase in part-time faculty, and limited experience in clinical and didactic teaching could decrease program quality and increase responsibilities and burdens to the remaining full-time faculty (Formicola, 2017).

The future of dental education and the current curricular changes point to continuous change and adaptability, placing new and different demands on faculty. Faculty must be lifelong learners with the expectation of continually improving the curriculum to meet the needs of their students. Faculty must also be innovative and work across disciplines to prepare future clinicians (Bodinet, 2016). Faculty must leverage innovative approaches to better prepare their students for changing contexts (Bodinet, 2016). These opportunities within dental education warrant the need for this study to consider and plan the potential futures and need for faculty development to ensure faculty are prepared to teach futures-adaptive skills to learners.

United States faculty development programs and resources in dental education primarily come from individual schools and the American Dental Education Association (ADEA). The programs from ADEA typically target leadership for faculty in dental education. The resources on ADEA's website include teaching resources for course design, assessment, and teaching theory ("Resources for Teaching", n.d.). ADEA also has ADEA WeTeach®, which offers a way for dental educators to access "high-quality teaching, learning, and assessment resources" ("ADEA WeTeach", n.d.).

Existing literature on preparing faculty to teach future professionals is limited within dentistry, with most research focusing on dental students and current changes needed for the dental curriculum (Haden et al., 2021). The nursing profession has started to research faculty preparation. McPherson and Candela (2019) conducted a Delphi study to understand faculty's learning preparation better and need to teach future nurses. Findings from the Delphi study indicate a need for clear expectations of the clinical teaching role, clear and consistent communication, and orientation to teaching (McPherson & Candela, 2019). While in a different field, the nursing profession compares to dentistry as they are both clinical fields, have challenges with faculty recruitment, and are impacted by the healthcare system at large. Considering these comparisons, this research provides insight and potential comparison to what may be needed to prepare dental faculty to teach the future workforce. Determining how dental faculty will need to prepare to teach future dental students may lead to opportunities for faculty readiness to support and prepare dental students for an evolving, complex, and diverse healthcare system.

Conceptual and Theoretical Frameworks

This study is grounded in futures studies, competing values theory (CVF), and neo-institutionalism. Futures studies is multi-disciplinary research that maps alternative futures through prospective thinking in planning and decision-making to navigate societal changes (Anthoni et al., 2020). Anticipatory futures will frame how this study will elicit and interpret data from dental faculty and their perspectives on the future of dentistry and dental education.

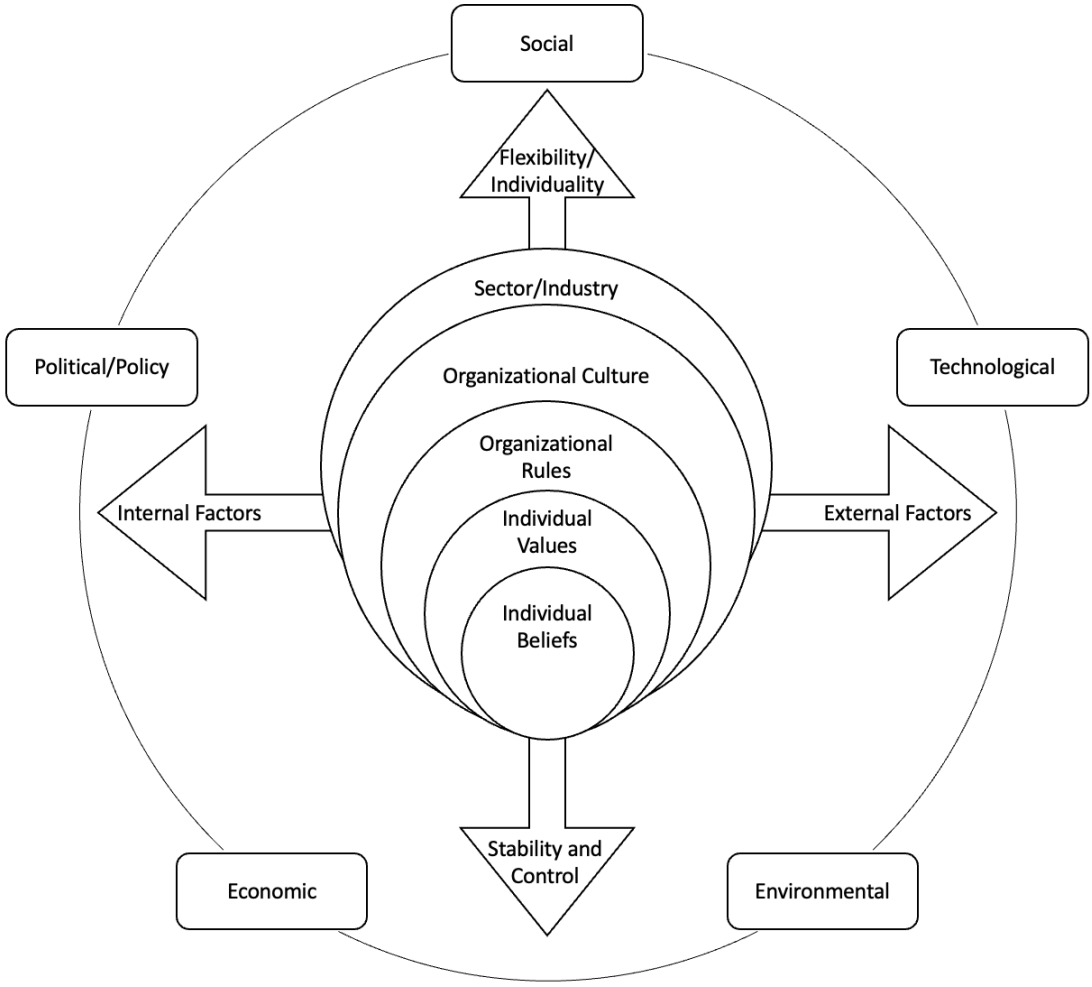
CVF is a theoretical framework that identifies and interprets an organization's competing priorities and values (Quinn & Rohrbaugh, 1981). CVF will deepen analyses by exploring

underlying myths and metaphors for social change that reveal conflict and dissonance during the change process across internal-external and individual-social dimensions.

Neo-institutionalism connects the frameworks utilized in this study. Neo-institutionalism seeks to understand organizational or social systems behavior influenced by external organizations and social systems influences and recognizes multiple layers of influence from societal to individual levels. For this study, the individuals of interest are faculty members, the organization is dental education, and the sector is healthcare. These layers are influenced and impacted by societal, technological, economic, environmental, and political (STEEP) influences that affect the future while also considering the competing values within dentistry (Figure 2.4).

Figure 2.3.

Neo-institutionalism across social systems embedded within the tensions of the Competing Values Framework and STEEP



Note: I developed this figure based on how the three frameworks interplay and interconnect with one another.

Futures Studies

"Futures studies is a systematic study of possible, plausible, probable, and preferable futures including the worldviews and myths that underlie each future" (Inayatullah, 2012, p. 5). Since the 1960s, futures studies is a valid interdisciplinary discipline rooted in sociology and

policy sciences (Kristóf & Nováky, 2023). The discipline began as predicting and forecasting the future and evolved to mapping alternative futures to then shaping desired futures and anticipating at individual and system levels (Inayatullah, 2012). The main purpose of futures studies is to "discover and master the complex chains of cause and effect through conceptualization, systemic approach, and feedback loops" (Motti, 2022, p. 1).

As noted by the World Futures Studies Federation (WFSF), futures studies is a pluralistic approach allowing for envisioning and creating preferred and alternative futures to develop desirable outcomes (World Futures Studies Federation, 2023). Futures studies extend to planning and anticipating multiple futures through various techniques and methods designed to consider *volatile, uncertain, complex, and ambiguous (VUCA)* environments and post-normal times (Sardar, 2010). Engaging in futures activities includes creating alternative futures while scanning for potential wild cards and weak signals. Driving forces are other critical considerations with futures works contending that multiple forces directly or indirectly influence individuals and organizations from the environment. The acronym *STEEP* categorizes those driving forces influencing change and the futures: Social, Technological, Economic, Environmental, and Political/Policy. These driving forces and futures affect the immediate, organizational, and global environments (van Duijne & Bishop, 2018). Ultimately, individuals and organizations need to consider how futures are shaped and influenced at individual, local, community, and global levels. Another common element in futures work is identifying trends and engaging in scenario development to create multiple alternative futures.

The discipline of anticipation was initially proposed to avoid creating boundaries of a single discipline for futures studies and allow for greater diversity, creativity, and collaboration (Miller, 2018). The discipline of anticipation consists of many "ways of knowing," offering ideas

and tools to conceive possible, probable, and desirable futures and to work with or "use" the future (Inayatullah, 2008; Miller, 2018). Anticipation includes knowing and using the future while improving the "conscious use of the future in the present" (Rossel, 2010) to anticipate, invent, and create. Anticipatory activities reveal three categories as part of the theoretical underpinnings of the discipline of action: optimization, contingency, and novelty (Miller, 2018). Further, futures literacy and complexity are two key components of the discipline of anticipation. Futures literacy is the ability to acquire the "know-what, know-how, know-who, and know-why" to implement anticipatory systems appropriately (Miller, 2018). Complex problems or systems include diverse causes that must be addressed as entire systems rather than individual problems (Miller, 2018).

Ultimately, this study is first looking to ascertain a complex problem and system, the future of dentistry, and then looking at how to "use-the-future" by determining how best to prepare dental professionals. This study will utilize futures strategies to anticipate the futures of dentistry and dental education through feedback, input, throughput, and output. The design will allow learning from dental faculty about the opportunities and barriers of the future, possible and plausible trends, and scan for possible wild cards and weak signals within the field. In turn, this will lead to dental faculty considering how best to prepare dentists.

Competing Values Framework

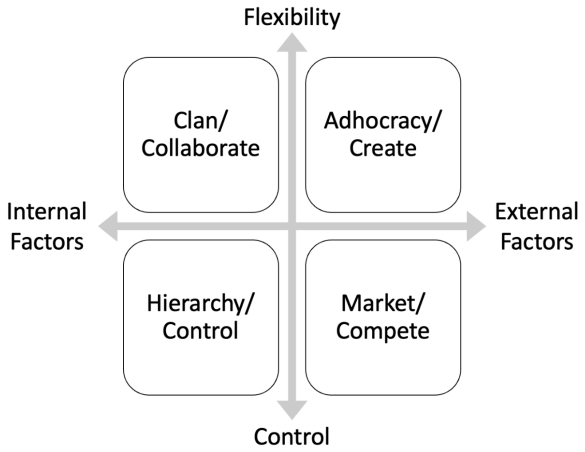
The competing values framework (CVF) central premise is that "an organization's effectiveness is dependent upon its ability to navigate multiple competing priorities" (Quinn & Rohrbaugh, 1981). CVF allows for interpreting perspectives and how an organization is looking at challenges. This theoretical framework examines two dimensions: the dichotomy of adaptability and stability as the vertical dimension, then internal and external forces on the

horizontal axis. Adaptability and stability guide the priorities that drive the organization's tension and harmony, ultimately reflecting the organization's function (Quinn & Rohrbaugh, 1981).

The vertical and horizontal dimensions create four quadrants, producing four organizational culture profiles: collaborate, create, compete, and control (Figure 2.5: OCAI Profiles). The control profile, also known as the hierarchy culture, is characterized by a formalized and structured workplace with procedures, authority, control, and accountability. The compete profile, as well as the market culture, focuses on the consumers, drives towards productivity, results, and profits, and emphasizes winning. The collaborate profile, known as the clan culture, is a team-based culture concerned with the people and seeking consensus. The create profile, known as the adhocracy culture, is characterized by risk-taking/oriented, innovation, emphasis on the leading edge of new knowledge, and a focus on rapid growth. There is a relationship between these four quadrants where the collaborate (clan) competes with the compete (market) quadrant. The control (hierarchy) competes with the create (adhocracy), giving rise to the name of CVF (Cameron & Quinn, 2011). No one profile is preferable, and an organization can be a mix. However, a company's trend toward one overarching culture type may prevent the organization from optimal effectiveness (Cameron & Quinn, 2011).

Figure 2.4

OCAI Profiles



Note: This figure is replicated from Cameron & Quinn, 2011

Cameron and Quinn (2011) developed an Organizational (OCAI) tool to help with diagnosis and assess where the organization is currently and what may occur in the future. The tool considers three questions: "What should we do more of? What should we start? What should we stop?" Ultimately, CVF provides a way to diagnose and initiate change within an organizational culture, which can be challenging to describe as culture is typically invisible. For this study, the organization of interest is dentistry. CVF will guide the tensions between the organization, including the external and internal factors that may impact the future of dental education.

Neo-institutional Perspective

Neo-institutionalism, also referred to as new institutionalism, is an organizational theory introduced by sociologists John Meyer and Brian Rowan in the late 1970s (Meyer & Rowan, 1977). Initially, neo-institutionalism was a way to explore how organizations fit with and are shaped by an institution or social sector. An institution refers to the norms and rules of specific systems in societal, state, national, and global environments. Neo-institutionalism has broadened

to include how these large institutions and isomorphism shape organizations, how the individuals within the organizations are impacted, and how the individual and organization shape the institution(s) (Thornton, 2004). Further, neo-institutionalism seeks to understand organizational behavior influenced by individuals, external forces and organizations, and broader social forces. The forces that drive change are driven externally diffusing into an organization and internally coming from within the organization (Hu et al., 2017; Scott, 2001).

Neo-institutionalism explores the meso, macro, and microenvironments impacting change across social institutions, institutional sectors, particular organizations, and individuals and their relationships within organizations. The neo-institutional perspective suggests that healthcare impacts various social systems, from individual beliefs to the sector or industry, which also is affected by multiple tensions, as noted in CVF. Dentistry is becoming integrated within the healthcare system and collaborating with other healthcare systems. Neo-institutionalism can help understand the organizational behavior within dentistry and dental education in the context of the future of dental education and how best to prepare faculty.

For this study, neo-institutionalism ensures that healthcare overall is considered within dentistry as there are direct and indirect impacts from the healthcare system. These impacts include organizational culture, organizational rules, individual values, and individual beliefs. This framework situates the study's participants within dental education and the larger healthcare context to facilitate understanding dental faculty perspectives for the future. For our purposes, neo-institutionalism provides the whole-systems perspective of dental practices and education within and across organizations, the sectors of dental education and the medical professions, and in relation to and in interaction with other systems such as healthcare, education, policy,

technology, and societal expectations. This neo-institutional framing will explore perspectives about the future of dentistry and dental education.

Chapter Summary

The review of the literature revealed past and present trends within healthcare and dentistry. The healthcare system is becoming increasingly interdisciplinary and technological, focusing on improving health outcomes (Bailit, 2017; Weintraub, 2017; Vujicic et al., 2016; World Health Organization). The dental field is seeing these same shifts and has an opportunity to become less siloed and integrate within this healthcare system (Formicola, 2017). Further dental education typically trains to traditional roles within dentistry, even with the progressive changes across the field and in healthcare. The individuals who are responsible for preparing future dental providers are dental faculty members with generally limited training within education (Graham et al., 2012).

As the review reflected, there is a void in research on how dental faculty perceives the profession's future and how these futures may impact dental faculty preparation in teaching dental healthcare professionals. This is important because, without adequate knowledge, skills, mindset, and preparation, predoctoral dental programs and faculty will not be prepared to teach oral health professionals and prepare them for the evolving profession. Therefore, this dissertation responds and fills the void by allowing faculty members to think through and consider what the dental profession and, ultimately, dental education needs to do to ensure the profession and clinicians are prepared for the future. The next chapter discusses the research methodology and participants for this study.

CHAPTER 3: METHODOLOGY

Introduction

This qualitative instrumental case study explored the expertise of dental healthcare faculty to identify and provide insights into how dentistry and dental education will need to change. Through the lenses of futures studies, competing values framework, and neo-institutionalism, the goal was to gain the perspectives of dental faculty on the future of the dental healthcare system, how and why dental education may need to change, and how dental faculty need to prepare for those forecasted changes. The research questions guiding this study are:

1. How do dental faculty envision the future of dentistry?
2. What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists?
3. What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists?

I begin this chapter with an overview of the qualitative research paradigm, a description of the instrumental case study used, and the rationale for choosing this research design. Next, I discuss the selection of research participants, ethical considerations, positionality, data collection, and data analysis processes. I then discuss trustworthiness, the study's methodological integrity, and the study's assumptions, limitations, and delimitations. I then conclude with the chapter summary.

Research Design

Qualitative Research Paradigm

Qualitative research provides an opportunity to make sense of meanings and understand a human or social problem (Creswell & Poth, 2018). Generally, qualitative research focuses on

discovering a phenomenon versus verification (Amber et al., 1995) and is exploratory in nature (Creswell & Poth, 2017). This study is exploratory and seeks to gain textual and narrative data rather than numerical data to address this study's open-ended research questions.

Case Study Method

This study utilized an instrumental case study of dental faculty as the qualitative research design. Case study research focuses on an in-depth understanding of a case by asking 'how' and 'why' questions and where the behavior cannot be manipulated within the study (Yin, 2003). Case studies can be used when the boundaries are not clear between the phenomenon and context (Yin, 2003). An instrumental case study focuses on the study of a case (e.g., a specific group) (Mills et al., 2010) to understand a specific issue or problem (Stake, 1995). This study explored the expertise of one specific group in the field, dental faculty members, on a specific issue: the dental profession's future.

The main goal of this study was to gain a deeper understanding of the themes across an organization/field (dentistry) and address questions of how to prepare dental faculty, leading to future-ready dental professionals. Currently, there is lack of understanding of what is known about the alignment of the futures within dentistry across stakeholder and 'how' faculty are perceiving those futures and what they need to prepare to teach. A case study approach allowed me to learn from the participants as they described and made sense of their experiences within dentistry and dental education and translate that to what is likely to come. Leveraging a case study approach allowed me to gain multiple perspectives of what the participants understood was going on within the profession and what they needed to prepare.

A main component of case study research is to bound the case (Stake, 1995; Yin, 2003). This study was based on the specific expertise of dental educators. Participants were selected

from predoctoral dental education programs across the United States. Dental faculty members were defined as teaching didactically or clinically dental students at any time in an undergraduate pre-dental program. They did not need to be dentists to participate in this study. Dental faculty had various responsibilities in teaching, research, service, administration, and patient care. Participants in this study represented a broad range of responsibilities within the dental education preparation programs in which they participated. Ultimately, the case is one of the revelatory perspectives for the future of dental education at the predoctoral level, which includes three-to-five years of didactic and clinical training, preparing students with the knowledge, skills, and dispositions necessary to become a dentist.

Research Participants

Dental faculty members teaching in United States predoctoral dental programs were the participants in this study. A group of 10 participants were purposefully selected based on their expertise and participation in teaching predoctoral students. Participants did not need to be a dentist; however, they had to be current dental faculty members at an accredited dental school full-time and teach in the predoctoral program at the time of the study. Exclusion criteria were if the faculty were adjunct faculty at the dental school or they did not currently teach in the predoctoral program.

I used purposeful sampling (Patton, 2015), beginning with two individuals from my previous institution who provided a list of seven faculty to start recruiting from. Through snowball sampling, I asked five additional participants if there were other dental faculty to consider contacting. In total, I emailed 16 faculty members to consider participating in this research. Out of those faculty, three did not respond, two were not able to participate due to time

constraints, and one was not eligible to participate. No participants were selected from any program where I have previously worked.

I used email communication (Appendix I) to recruit participants. The email described the study, including its purpose, the participant's role, the intended time commitment, the risks and benefits of participating in the study, and the next steps for selecting an interview day and time if they agreed to participate. The email also included an attachment of the interview consent form (Appendix II) which was discussed at the beginning of the interview to solicit verbal consent.

Ethics

I received approval from the North Carolina State University Institutional Review Board (IRB). I shared the consent form (Appendix II) with each participant before the start of the interview and asked participants for verbal consent before data collection. The study procedures were considered a minimal risk to participants. The participants were given pseudonyms, and all direct identifiers were removed throughout the research to maintain anonymity. Participants were reminded that they could stop their participation at any time. An interview guide (Appendix IV) was used to ensure the interview remained on topic. Recordings were stored on a password-protected laptop, and names were removed from transcripts and field notes. At the start of each interview, my positionality and efforts to achieve confidentiality and reduce the potential to link participants to findings were discussed. I managed and stored all raw data securely to maintain its integrity.

Researcher Positionality

I am interested in knowing how dentistry and dental education may change from the perspective of dental educators. I believe in the importance of collaboration and planning to anticipate for the future to ensure graduating qualified, practice-ready clinicians who can adapt to

any changes or settings that are to come. I am curious how dental faculty may also perceive and address the potential curricular and policy changes needed to prepare future dental professionals.

Over my professional and educational careers, I have taken courses and development sessions on futures studies, curriculum design, and program planning. I am a dental hygienist and have worked as an assistant professor teaching in the predoctoral program at one dental school for six years. Recently, I transitioned as an adjunct faculty member in the school and began a position in a medical technology company as a clinical education strategy manager. As a faculty member working closely with faculty, I am within the population of interest for this study.

The opportunities I have engaged, sought out, and been involved with have led to my academic evolution and trajectory. I have led the efforts of a complete curriculum change for the predoctoral dental education program at one university where I worked, served on the dental school's faculty development committee and promotion and tenure advisory committee, and participated in faculty development programs with other health professions at the school. These experiences and courses helped me conduct this research by putting me in a position to understand the population and complexities of the healthcare and dental education systems. Because of these experiences, I engaged in reflexivity throughout the process because my interpretations and judgments could have easily influenced the analysis. Because of this, I did not use participants from the institution I worked.

Data Collection

The primary data collection instrument was a semi-structured interview with each recruited faculty member. Memos were also generated to reflect the data gathered and keep track of my thoughts throughout data collection and analysis.

Semi-Structured Interviews

I used semi-structured interviews for this study. Semi-structured interviews combine asking a series of previously developed open-ended questions and impromptu questions based on the responses from the participants (Rubin & Rubin, 2012). This allows the researcher to pivot based on participant responses to explore responses deeper and expand. I used semi-structured interviews in this study to allow the flexibility to ask follow-up questions on responses and elicit deeper responses or clarification.

A semi-structured interview protocol (Appendix III) guided the interview process. Supplemental questions and probes were asked as needed. Participants were asked to consider how dentistry is within the healthcare context and utilize systems thinking to anticipate and analyze dentistry and dental education's present and future state. Questions also included what preparation, support, and resources faculty will need to teach future dental professionals. All interviews were conducted via Zoom, audio recorded, and ranged from 45-60 minutes.

I used my North Carolina State University Zoom account to conduct, record, and transcribe the interviews. Transcriptions were transcribed verbatim using the Zoom transcription function. I reviewed each transcript to ensure accuracy and remove identifiers by listening to the audio recording. Following the interviews, I contacted several research participants with portions of their interview for clarification to ensure my interpretation was accurate and ask follow-up questions. In total, I contacted four participants to clarify portions of their transcripts and received a response from two of them indicating my interpretation was correct.

Memos

Memos create an audit trail (Creswell & Poth, 2018; Merriam & Tisdell, 2015) and make sense of the data (Miles et al., 2014). I wrote memos before, during, and after the interviews to

document my reflections, tentative themes emerging, and any areas to follow-up on (Merriam & Tisdell, 2015).

Data Analysis

Data analysis began with the first interactions of data collection. Because qualitative research is emergent and dynamic (Merriam & Tisdell, 2015), I conducted simultaneous data collection and analysis (Miles et al., 2020). I used ATLAS.ti to organize all transcripts for the coding and analysis process. Coding was conducted following Miles et al. (2020) coding methods. The first cycle of coding used descriptive coding and simultaneous coding (Miles et al., 2020). Simultaneous coding is applying two or more codes to sequential units and is "appropriate when the data's content suggests multiple meanings (e.g., descriptively and inferentially)" (Miles et al., 2020, p. 81). The second cycle of coding used pattern coding to develop themes (Miles et al., 2020). Tags were also utilized as a labeling process within coding to help identify themes. I used constant comparisons to look for similarities and differences between codes to create more robust themes and reach thematic saturation (Corbin & Strauss, 2014). Once I concluded the first and second rounds of coding, I organized the emergent themes based on research questions. Inclusion and exclusion criteria, along with definitions, were outlined in a codebook.

Establishing Rigor and Trustworthiness

Qualitative researchers have established validation criteria as in quantitative approaches (Creswell & Poth, 2018). Terminology for methodological rigor and trustworthiness can vary based on the researcher. Traditionally, qualitative research approaches to validation paralleled quantitative research. Qualitative research often draws from Lincoln & Guba's (1985) criteria for trustworthiness: credibility, transferability, dependability, and confirmability. However, validation criteria in qualitative research have changed over time (Tracy, 2010). Tracy (2010)

developed a model for qualitative researchers to draw from. The eight key markers of quality in qualitative research include "(a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence" (Tracy, 2010, 837).

Worthy Topic

A worthy topic is "relevant, timely, significant, and interesting" (Tracy, 2010, 840). With the evolving healthcare system and other external (e.g., COVID-19 pandemic) and internal (e.g., legislation) forces impacting dentistry, the topic of this study is relevant for dental clinicians and healthcare providers. The topic of this study relates to how future dental providers will be ready to navigate the future of dentistry and healthcare. It will then ultimately help dental faculty and institutions prepare for these changes and teach future dental professionals.

Rich Rigor

Rich rigor is when there is a variety of appropriate and complex theoretical constructs, data sources, and samples for the study (Tracy, 2010). Rich rigor is accomplished through "sufficient, abundant, appropriate, and complex" constructs and processes. In this chapter, I detail this study's data collection and analysis processes. I leveraged data from interviews across multiple US dental faculty, reaching data saturation when the same themes emerged as the interviews went on and ensuring there was an abundance of descriptions and explanations (Tracey, 2010).

Sincerity

Sincerity is accomplished through "self-reflexivity, vulnerability, honesty, transparency, and data auditing" (Tracey, 2010, p. 841). Sincerity occurs when the researcher is honest and transparent about their position, biases, and goals. My positionality is stated in this chapter,

where I share my assumptions, prejudices, and relationship to this topic. I engaged in reflexivity throughout the research process by including my reflections in memos to determine how my position may influence the research processes. Lastly, I address transparency by stating in this chapter the limitations and delimitations of this research.

Credibility

Credibility in qualitative research is "achieved through practices including thick description, triangulation or crystallization, and multivocality and partiality" (Tracy, 2010, 843). I used rich, descriptive data and detailed descriptions that are easily understood in chapter four where I present the findings in the participants' own words. Using rich, thick data and easily understood descriptions allows an account of the participants' viewpoints and perceptions.

Triangulation is a method to check and establish validity in qualitative research (Denzin & Lincoln, 1998). Denzin & Lincoln (1998) discussed five types of triangulation: Data triangulation, investigator triangulation, theory triangulation, methodological triangulation, and environmental triangulation. Theory triangulation was achieved in this study by drawing on futures studies, competing values framework, and neo-institutionalism to extend knowledge and multiple viewpoints.

"Multivocality provides space for a variety of opinions" (Tracy, 2010, 844) within a study. In this study, all participants taught in predoctoral dental programs; however, they varied in years of clinical experience, years in educational experience, location, age, and perspectives. These varying characteristics result in a variety of participants' perspectives in this study.

Resonance

Resonance is the researcher's "ability to meaningfully reverberate and affect an audience" and is achieved through "aesthetic merit, evocative writing, and formal generalizations

as well as transferability" (Tracey, 2010, 844). I used rich, descriptive data and detailed descriptions to allow readers to determine how closely their context or situation matches the research situation (Donmoyer, 1990; Merriam, 1995). Additionally, I discuss practice implications and future research in chapter five.

Significant Contribution

Significant contribution is when the research provides a conceptually, practically, morally, methodologically, or heuristically significant contribution. When gauging a study's contribution, researchers should consider the following questions: "Does the study extend knowledge? Improve practice? Generate ongoing research? Liberate or empower?" (Tracy, 2010, 845). There are four domains of significant contribution: theoretical, heuristic, methodological, and practical (Tracy, 2010). This study's findings have heuristic and practice contributions. Heuristic significance encourages others to further research or act on the research (Tracy, 2010). Findings from this study in chapter four and the discussion of future research in chapter five provide suggestions for future directions and thoughts on the future of dentistry and what support and training dental faculty need in preparation for this. Practical significance "asks whether the knowledge is useful" (Tracy, 2010, 846). Chapter five discusses the practical contributions of this study which include the need for changes and reduction of barriers across the healthcare sector, dental organization, and dental institutions.

Ethics

Ethics in qualitative research includes four practices: procedural, situational, relational, and exiting (Tracey, 2010). Procedural ethics refers to standards developed by institutional review boards (IRB) (Tracey, 2010). I received approval from North Carolina State University's IRB for this study. Situational ethics occurs during data collection and requires researchers to

"repeatedly reflect on, critique, and question their ethical decisions" (Tracy, 2010, 847). I used an interview guide throughout the interviews and reflected on my positionality and interactions with participants. "Relational ethics involve an ethical self-consciousness in which researchers are mindful of their character, actions, and consequences on others" (Tracy, 2010, 847). As with situational ethics, I reflected on my interaction with participants and ensured awareness of my influence as the researcher. Exiting ethics continues past data collection of the study and considers how researchers leave the site and share their results (Tracy, 2010). After each interview, I thanked the participant before leaving the virtual interview and sent an email thanking them for their time. I took precautions to ensure each interview recording and transcript were kept safe and confidential. All identifiers of participants were removed to ensure confidentiality.

Meaningful Coherence

Meaningful coherence indicates that the study achieved the intended purpose, leveraged methods that fit the goals of the research, and interweaved literature, research questions, findings, and interpretations meaningfully. I organize the study findings based on the research questions in this study in chapter four and then I detail the findings of the study in relation to current literature and research and practical implications in chapter five.

Assumptions, Limitations, and Delimitations of Study

Assumptions are self-evident truths often taken for granted; however, without them, the study would be pointless (Leedy & Omrod, 2010). Limitations are the systemic biases that a researcher cannot control, affecting the results (Price & Murnan, 2004). Delimitations are systematic biases introduced in the study by the researcher (Price & Murnan, 2004). The following subsections detail this study's assumptions, limitations, and delimitations.

Assumptions

Given that the participants in the study are educators from accredited dental programs and have engaged in curriculum reform, it is assumed that the participants have considered the future of dentistry and dental education. I assume that participants can identify and describe the current state of dentistry and dental education while projecting what the future may be like for the profession. I also assume participants will be open and honest when sharing their viewpoints on the future of dentistry and dental education.

Limitations

One limitation is using purposeful and snowball sampling. While I used this type of sampling, the perspectives of the participants are not generalizable to all faculty. I likely missed a variety of perspectives and thoughts about the dental profession. The second limitation is the reliance on predoctoral dental faculty participating in the study. Dental faculty have had to take on additional responsibilities during the COVID-19 pandemic. These added responsibilities may leave little time to participate in activities not included in their everyday tasks. A third limitation is only gaining the perspective of dental faculty and no other stakeholders. While the primary focus was determining how dental faculty need to prepare, and their voices are central to this, it would be beneficial to gain the perspectives of students, alumni, and other stakeholders. The intention is to acquire other stakeholder perspectives in future phases of this work. Fourth, the transferability is likely limited as the population is only from a small number of dental faculty in the United States, which includes varying demographics.

Delimitations

Delimitations of this study are the focus, purpose, and participants included. The thoughts and perceptions on the future of dentistry from other stakeholders, such as patients, clinicians,

students, and other medical providers, are excluded from this study. There is also the potential exclusion of dental faculty due to purposeful sampling.

Chapter Summary

This chapter provided a methodological overview of the planned study. It outlined the appropriateness of an exploratory research design. Then, the chapter detailed sample selection, my positionality, data collection, data analysis, and trustworthiness. Lastly, the chapter concludes by identifying the study's assumptions, limitations, and delimitations. Chapters four and five will detail the study's findings, conclusions, and implications.

CHAPTER 4: FINDINGS

Introduction

The purpose of this instrumental case study was to explore United States dental faculty members' vision of the future in dentistry and how dental faculty will need to prepare future-ready dentists. The theoretical and conceptual frameworks grounding this study were futures studies, competing values theory, and neo-institutionalism. The study was guided by the following three research questions:

1. How do dental faculty envision the future of dentistry?
2. What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists?
3. What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists?

I used semi-structured interviews as the primary data source. I begin this chapter with a summary of participant profiles, followed by the presentation of findings related to the research questions, and end with a summary of the findings.

Participants

There were 10 participants in this study. I used purposeful sampling by first emailing individuals with whom I have had a professional relationship for recruitment. I then used snowball sampling by asking participants for their recommendations for other dental faculty members to consider. There were no participants selected from any program where I have worked. All participants taught in predoctoral dental programs and were willing to share their perceptions and thoughts about the future of dentistry. Of the 10 participants, 8 were female and 2 were male. Participants represented a variety of disciplines, including general dentistry, public

health dentistry, pediatric dentistry, dental hygiene, and biomedical sciences. Five participants were administrators at their dental institution. Participants spanned seven institutions and five states: Florida (1), Michigan (3), Missouri (3), Ohio (1), and Texas (2). Participants had varying years of experience in dental education and at their current institution (Table 4.1).

Table 4.1

Participants' experience in dental education and current dental institution

	Years				
	1-5	**6-10**	**11-15**	**16-20**	**21+**
Years in dental education	2	2	1	3	2
Years at current dental institution	4	3	0	1	2

Note. The total years in dental education is the total number of years spent in dental education, which includes the time at their current institution plus any past institutions.

Themes by Research Question

Data analysis included multiple rounds of coding using ATLAS.ti software. The first cycle of coding included descriptive coding and simultaneous coding, which generated 1337 codes and tags across the 10 interviews. The second cycle used pattern coding, categorizing the codes from the first cycle into ten categories. From there, I created themes and subthemes organized by the three research questions.

Research Question 1: How do dental faculty envision the future of dentistry?

Participants largely discussed their future of dentistry in the interviews which were elicited from the following prompts:

1. Based on your professional experience, what healthcare trends have or will majorly impact the dental profession?

2. When you think about dentistry in the coming decades, what do you envision?
3. What changes do you think will occur in present-day dentistry in the future?
4. What three key competencies will be essential to practice dentistry in the next 30 years?
5. How do you think society will influence the dental professional?

There were 218 first-round codes and tags initially emerging on participants' vision of the future of dentistry. Following the first-round coding, six themes emerged in the faculty's vision of the future of dentistry: (1) dental professionals as healthcare professionals; (2) evolving roles of the dental team; (3) patient influences; (4) continuation of technological advancements; (5) payment and care reform; and (6) competing views of the future within self. Table 4.2 displays the themes according to participant responses.

Table 4.2

Themes according to participant response for faculty's future vision

	Dental professionals as healthcare professionals	**Evolving roles of the dental team**	**Impacts of patient expectations and patient advocacy**	**Continuation of technology advancements**	**Payment and care reform**	**Competing views of the future within self**
Clark			■	■		
Harris	■	■		■		
Marshall	■	■		■	■	■
Miller	■	■	■	■	■	
Morgan	■		■			
Reed	■	■	■	■	■	
Smith	■			■		■
Stevens	■	■	■		■	■
Walker	■	■	■	■	■	■
Williams	■	■	■	■	■	■

Dental professionals as healthcare professionals

Participants desired dentists to understand "how [they] would fit into [the healthcare] system" (Walker) and practice within the sector. Morgan expressed that "where dentistry or oral

healthcare fits [into the healthcare system] is an important piece of the puzzle - from how care is financed to how it is delivered to how it is reimbursed" (Morgan). Four participants noted that they feel they have been able to gain a better understanding of the healthcare system through separate experiences beyond dental education and experiences as dental professionals. Walker specifically shared that the only reason she gained this understanding was "because [she] went and got [her] Master's in Public Health at an academic medical center after dental school, where [her] classmates were physicians and administrators at hospitals" (Walker). All but one participant discussed a need for dental professionals to act as healthcare professionals in the future. Within the theme of dentists becoming healthcare professionals, two subthemes emerged: medical-dental integration and interprofessional practice.

Medical-dental integration

Seven participants discussed oral-systemic health as part of their optimistic view of dentistry's future and how dentistry will fit in to the over-all healthcare system. Encompassing medical-dental integration within dentistry and healthcare focuses on the health of the entire patient and bridges dentistry into primary and behavioral health. This is a past and current trend within healthcare that will continue to grow. Miller, for example, believes there will be "more of a narrowed focus on whole body health, and the practitioner really understanding how to relate systemic health to overall health to the patient and integrating that into more of a holistic perspective" (Miller). Walker adds,

> Over the past few decades, dentistry has taken on more medical screenings, things like doing blood pressure and vitals, other screening tests like taking A1C's or blood glucose before visits. So, I think we're seeing more of that. And then on the other side, we're seeing our medical colleagues take on more dental responsibilities. Things like dental

> screenings, application of fluoride varnish, and I think that will continue to expand as the oral health workforce continues to not meet the needs of the population. So, I think we're going to see definitely more medical-dental integration.

Expanding medical-dental integration across healthcare can reduce patients from going to hospitals and the risk of surgery. Prevention and risk mitigation are important elements of this. Morgan shares that through his work with an accountable care organization, he has been part of pilot programs that focus on patient outcomes across medical-dental perspectives.

> I'm learning a lot about the future of health care in that as well and I see a lot of work being done now at pilot levels within our organization that is trying to meet people where they are, it's trying to really intensify primary care efforts and risk mitigation. I wouldn't call it risk profiling, but some might, and I don't think there's anything necessarily wrong with that. All of the work is geared towards trying to keep both healthy and functioning at their best. And keeping them out of hospitals or tertiary care centers, keeping them out of surgery as long as possible. Those are the things that are happening now, and even 5-10 years from now, I see a lot of that still being relevant and consistent with the work that's being done. (Morgan)

Dentists need to embrace their role as primary healthcare providers, in combination with their existing role as surgical specialists and, for some, as business professionals.

> I would love to see us recognize our two distinct roles. This is a bit of a soapbox of mine, but I would love to see us as a profession acknowledge that we are both primary care providers and surgical specialists and for many also businessmen, which is a third hat that we have to wear sometimes. (Morgan)

Change is necessary to place dentistry within the healthcare system and for medical-dental integration to happen. As discussed in Chapter 2, the dental profession is predominately siloed from the healthcare system and other health professionals. This is deeply rooted in the history of dentistry and is prevalent to this day.

Six participants indicated being siloed and disjointed from healthcare as part of their pessimistic view about the future of the field. They felt dentistry would remain siloed in the future and that a culture shift is needed within the profession and in healthcare.

> I feel like we still, by and large, it's all about this [pointed to mouth], and we don't function in practice like healthcare providers. We're still very separate. We're still very production-based, and it's all about, you know, this [pointed to mouth], and it's not about the whole picture. And so that's going to be a huge culture shift. (Reed)

Five participants shared that "despite some movement, [dentists] will resist change" (Walker) towards more integrated healthcare. This resistance to becoming more involved and integrated with the healthcare system will hold back dentistry as "the healthcare system is moving forward without us" (Walker). The resistance to integration also penetrates across the entire sector of healthcare, where a mind shift is necessary across healthcare professions for true integration over the coming decades.

> I don't think that there's enough buy-in from the general healthcare side of it for us to be really integrated into the whole healthcare system. I would love to not see that…but there has to be a whole mind-shift, a mind change in the healthcare industry. (Marshall)

The past and present reflect dentists and other oral health professionals not being able to help in public health crises, e.g., the COVID-19 pandemic. If dentists are prepared as primary

care providers, there is potential for them to help and support other health professionals. As Stevens shared,

> Dentists need to be prepared to be more of a primary care provider. For example, being able to administer the COVID vaccination while the patient was [at a dental appointment], or flu shots or HPV. There's been lots of talk about HPV vaccinations, and our legislator here in [*state blinded*] has been trying to get something through for the last two years for dentist, even for dentists to just be able to write a prescription so that [patients] could go to CVS and get it, because you can't just go in and say, "I want to get my child vaccinated for HPV", at least in [*state blinded*], there has to be a health care provider that writes the prescription. (Stevens)

Healthcare keeps "advancing and advancing, and if [dentistry] doesn't integrate, [dentistry will] make [themselves] irrelevant" (Reed). The healthcare sector will move on without dentistry and begin filling in the gaps of access and care needed to ensure patients' whole-body health is taken care of. Other health professionals are beginning to step up for dental professionals' lack of providing necessary care to patients. Healthcare programs are starting to recognize and integrate oral health into their process of care.

> I am seeing non-oral health providers integrate oral health into their process of care. I'm the [*state blinded*] Champion for the 100-Million Mouths Project…we're going around within each of our assigned states reaching out to most practitioner programs, physician assistant programs, physician, medical school, like any program that says, "Yeah, we're interested in integrating oral health into our curriculum," we'll work with them. And the uptake is it's growing. And so, I do see where, because there is this gap, and we now recognize oral health as part of overall health that other providers are going to start

> getting more involved, and especially when Medicaid will reimburse for some of what they're doing. (Stevens)

Additionally, Walker and Reed discussed how other healthcare professionals are starting to provide oral health treatment, such as fluoride applications. Walker describes how school nurses have started to provide silver diamine fluoride to children to prevent cavities from occurring.

> One of the sites I'm working with is in [*city and state blinded*], and it's a pediatrician, a group of pediatricians and residents that are being trained to provide care to children that have different disabilities, primarily autism, but it can be a whole range. And these kids, most of them, can't just go into the dental office and tolerate what's going on but when they're in the office seeing us, we can real easily do a quick screening, make sure there's no urgent needs, put on some fluoride varnish even SDF (silver diamine fluoride)…There was a study that just came out where they were using SDF and sealants versus SDF and fluoride varnish on occlusal surfaces, and it worked as well as sealants and nurses were placing it, school nurses. Well, there's a game changer if the school nurses can put some SDF on it surfaces and it prevents caries, how easy would that be? (Walker)

Interprofessional practice

With the efforts toward medical-dental integration, seven participants raised the issue that dentistry and healthcare will need to change the healthcare delivery models. Participants characterized these models through interprofessional practice, which seeks to provide patient-centered care through collaborative practice across multiple professionals. Miller expressed that "part of a growth opportunity for the future is the oral health care professional team, everybody kind of working together." One example of this model is connecting a private dental office to a medical practice.

> I envision less of a cottage industry and more of a mainstream health provider who is practicing in areas that aren't traditional right now, like medical centers, things like that, that I see that happening, and it needs to happen because there is [sic.] the efforts to have medical-dental integration are not going to work unless we're embedded in those things. So, what does that look like? Well, it might be if you do have a private practice, the private practice is connected to a medical practice or something like that and instead of these standalone clinics. (Reed)

Another example of the model is in medical offices or health departments hiring dental professionals.

> I see lots of opportunities to work interprofessionally, in interprofessional teams. You know, having a dental hygienist that works at an OB office and provides a sort of services to people having babies. Or having someone in school districts…OTs (occupational therapists), PTs (physical therapists)…Skilled nursing facilities. Doctors treating oncology patients. I think there's opportunities within all of that to have oral health providers planted in those systems. (Stevens)

Dentistry can work in tandem with other healthcare providers to enhance the patient experience, reach more patients, and provide better patient outcomes. Participants shared that this can be done with dental health professionals working in interprofessional practices and bolstering relationships with physicians and other health professionals. Typically, the relationship is a referral system and does not allow for collaborative care. Williams details,

> I think what I would love to see is more interprofessional relationships rather than camps of "This is what I do, and this is what you do", and you know, you send your patient to me to do X and then I send patient X back to do that, right? And so I think, just within the

> disciplines of dentists, right, I think I wish there would be more collaboration, and when I talk about those conglomerates, I wish they were multidisciplinary in nature. (Williams)

One way to enhance the relationships between dentists and healthcare providers is to reconsider how the referral model looks. Dentists generally see patients multiple times a year compared to physicians, which provides an opportunity to work collaboratively to ensure optimal outcomes for patients. Harris describes,

> I think, in dentistry, we see our patients more often than physicians. We may see our physician once a year for a physical, but with dentistry, you know. I think what I'd like to see is that every dentist has a relationship with the physician because what I find is and with all doctors, no matter if it's a family practitioner or a specialist, they all kind of do their own thing, but there's no communication among the folks.

Evolving roles of the dental team

Seven participants discussed that the dental team would need to evolve in the future. There are existing roles that will need to expand and new roles that will need to be created. Harris reflected with one example that dental hygienists have become underutilized in the process of care and not fully leveraged to perform at the top of their license.

> I think that there are other dental professionals that are left out of the treatment planning and/or the practice management, if you will, that could really improve the care of the patient. Dental hygienist, dental assistants, even front desk people, right? So, I think that I wish for dentistry that, instead of it being a hierarchical business, that a dental assistants and dental hygienists were more integrated into the dental practice, regardless of specialty. (Williams)

Participants expressed they'd like to see current dental team members' roles become expanded and more integrated within the general dentist teams, dental specialty practices, and healthcare teams. Specifically, there is a vision for dental team members to "(learn) advanced technologies and being…more of an integral role in patient care" (Miller). The scope of practice for dental team members will need to be reviewed and changed across each state to ensure this can continue.

Faculty also discussed the need for midlevel providers, like the concept of nurse practitioners and physician's assistants in medicine. These providers, such as dental therapists, are already seen in a few states, and faculty shared that this needs to continue to expand across the United States once states pass legislation allowing these roles.

> Advanced practice providers is now hitting dentistry for the first time in the United States. So, I think that's going to have a huge impact. We see it having a huge impact in states that have it like Minnesota, Oregon, Washington, but I think we will continue to see that over time. (Walker)

Impacts of patient expectations and patient advocacy

Society will shape how dentistry changes and dentistry can "shape how society feels about dentistry" (Williams). Seven participants discussed the influence of and impact on patients and society from treatment modalities, models of care, and other changes. These changes will be driven by consumer demand and a need to better provide treatment for patients through person-centered care to reduce patient disparities in care and improve patient outcomes and quality of life.

Consumer demand

Patients as consumers will continue to grow and impact the dental profession. They want transparency prices and services for the care they receive yet are generally dissatisfied and distrustful of dentistry. Consumers of healthcare have a plethora of information at their fingertips. As Walker explains,

> I mean us as consumers of healthcare services are becoming really savvy. The internet has so much information that you know we're (society) becoming really savvy about, we want price transparency, especially when a lot of people lack dental insurance…I think those issues we have around price transparency, differences in treatment planning, and differences in opinion between professionals, I think is causing a little distrust, which I think is spurring consumers to demand other options…It's coming from other people that are consumers that are saying, "We want alternatives because we can't afford this but we know oral health is important, so we want to get it from someone else." So, I think we will continue to see things like that, consumers pushing for other options because dentists are unwilling to meet their needs.

Alternative to increased consumer demand and consumers' understanding of the importance of oral health, Stevens discussed how consumer demand for dentistry has not picked up since the 2008 recession and dropped again after the COVID-19 pandemic.

> It's the consumer's responsibility to know and appreciate being able to have dental care. But as the demand continues to not pick back up, you know, the data that [name blinded] shared, this was Pre-Covid, too, but in 2008, when we had the recession, like all the different professionals, they all like lost lots of business but after the recession was over, all but dentistry and attorneys had picked back up to be where they were pre-2008 and

> dentistry never did get back to where it needed to be. And now, after Covid, I think it's dropped more. And so, as their business starts slowing and they start seeing, "Okay, the demand isn't there," then I think that's going to force the change that needs to happen. (Stevens)

These contrasting viewpoints reflect how consumers impact dental practice in different ways and shift the models of care within dentistry.

Patients will expect to see more immediate services, results, and satisfaction. The continued rise in social media and online shopping are two examples reflecting this demand. Clark shared,

> I see that in the patients that I interact with, they want their results now and…it's like our brains are shifting to have this immediate satisfaction…Think of a TikTok video with a 30-second-long video but if it doesn't get your attention in those first 5 seconds, you're swiping away. And now we do everything online, and we get the results right away or you order something, and the next day it's at your door. And I think even services like medical, dental, that type of thing is going to transfer there as well.

If dentistry can make these changes based on the expectations of patients, this may lead to increased access to care and "making dentistry available to all" (Clark) versus only "a privilege just for those who can afford it" (Walker).

While there are potential positive implications to addressing consumer demand, there are also negative implications. Morgan expressed concern about fully catering to consumer demand. He has witnessed dental practices catering to specific populations and creating niche clinics that lack evidence and benefits for the patients.

> I think in that way, society, or a subgroup of society, is currently influencing and creating a very specific niche dental professional. I think that's happened in other areas as well in aesthetic or cosmetic dentistry - certainly important, it certainly can improve the lives of many people who see dentists in those practices, but I think a lot of that is driven by society. It has been, and I think will continue to be. And those gaps are probably only going to continue to widen. There may be fewer and fewer of us in the trenches, let's say, that are treating disease and others maybe. you know, catering practices towards certain populations that it it's not disease, it's, you know aesthetics and making their justification that way. And that's fine for some folks but maybe not for me. (Morgan)

Person-centered care

Person-centered care is when the patient is involved with their healthcare decisions and participates in their own treatment. Practitioners having a person-centered approach allow for alternative models of care to be leveraged within dental practice and allow interprofessional practice to occur. Creating a person-centered practice will require dentists to "incorporate people's values, preferences, their social determinants of health," which "can impact their patients' behaviors and health outcomes" (Walker).

Oftentimes and traditionally, providers will instead make the decisions for the patient on what treatment to provide and only offer one option to the patient. "More and more patients are wanting to be included in their healthcare decisions and understand their healthcare and their health status" (Walker). Multiple treatment options could be made, and person-centered care allows patients to be informed of their health and what options there are.

> Truly patient-centered care is where the patient has a decision in their care. I feel like a lot of times…you see a particular lesion, you make the diagnosis, and then there's only

> one treatment for that, and that's not true, there's a menu of options and almost all of it works, you just have to find the right thing for the patient that they want, that you also feel comfortable providing and approaching treatment planning as a shared decision is something that I don't think happens very often and maybe should happen more so that patients have an understanding of the risks they're undertaking or the benefits that they're seeking, or they that they may gain by selecting a particular option as it. The patients need to understand those risks and those potential benefits and what they're probably going to turn out the same no matter which option is selected. (Morgan)

Continuation of technology advancements

Eight faculty discussed that technology would continue to evolve and advance. The rapid changes to technology across healthcare will trickle down to dentistry and impact the way dental providers deliver care. “The use of technology for expanding healthcare access is definitely something that we need to lean into more, use more, provide for, and allow space for” (Smith). Overall, faculty believe that “there's been an adoption and an acceptance of technology in dentistry” (Walker). Harris reflected, “So, I think a lot of the things that we learned when I was a student will be kind of phased out in place of more technological advances in dentistry."

Technology is currently impacting and will continue to impact “the way dentistry works” (Clark). Participants discussed technological advancements that include artificial intelligence, haptic technology, digital dentistry, electronic health records, and telehealth. Clark, Walker, and Harris shared the increasing use of digital dentistry specific to tools to diagnose, leverage computer-aided design, plan treatment, educate patients, and print 3D models compared to analog dentistry (e.g., dental impressions with impression material or taking photos with a camera versus a scanner). Clark shared that embracing these new technologies is a skill set for

dentists and could lead to a new role within dentistry for someone specializing in digital dentistry and the design work behind 3D printing.

Electronic health records are one technological element that faculty have started to see. Electronic health records are also a way to integrate medicine and dentistry and allow for patient health records to be shared across offices within a network,

> In care delivery, delivery of care, I think the healthcare trend of the integrated health record and how hospitals are using a lot of these integrated health records. So, you could go from Mayo Clinic to [school blinded], and you're seeing the same record. In the way of health care delivery, I could see that that trickle down into dentistry and be super helpful. (Marshall)

Telehealth is another rising technological advancement within healthcare and dentistry, as expressed by four faculty. The COVID-19 pandemic allowed for a "pretty giant leap for healthcare" (Smith) to provide alternative opportunities to meet with healthcare providers virtually. In response to the pandemic, states allowed the adoption of teledentistry, which allowed clinicians to think creatively and to solve for dental offices closing except for emergency treatment. While teledentistry does not replace all office visits within dentistry, it does allow for flexibility for patients with consults and treatment monitoring. Smith shared that telehealth is also one way to address access to care issues for patients.

> I would say virtual access to patients could be one of the solutions, one of the answers to our access to care issues. I think it could provide a means for triage, no matter what the medical problem is…So I think we could see a huge improvement in health care in general, with the use of all the time, in all the places, instead of just for traditional patient

> comes to you model. I think that using telehealth would enable place-based care in a better achievable format, no matter what health service you're providing. (Smith)

Payment and care reform

One current trend within the healthcare system is payment and models of care reform. As discussed in Chapter Two, dentistry is considering new models of payment and care. Specifically, "the trend of encouraging payment for preventive care versus payment for restorative care could be a trend that could trickle into dentistry, and probably should and would be beneficial for our patients and our population" (Marshall). Throughout the interviews, six participants discussed that reform will be needed, especially when the dental profession becomes integrated into the healthcare system. Traditionally, healthcare largely had a fee-for-service model and has moved towards bundled payments and alternative practice models such as value-based care.

> So, in the larger healthcare system over the past few decades, we've seen major payment reform. So, moving from fee-for-service to bundled payments, alternative payment models, value-based care. We're seeing lots of creative solutions in the healthcare, larger healthcare side to reduce costs, hopefully, get better health outcomes and improve population health, that conversation is definitely happening, and more often in the dental community. We have some states that are trying value-based payment models. For example, Oregon has been trying it for the past several years with their Medicaid program. So, I think as we start to see the outcomes of those models, you'll also see other States replicate that, and possibly other payers like private insurance. So, I think that's something that we're already seeing a little bit of but we'll definitely be a disrupting force in the dental field. (Walker)

Private insurance companies, federal and state programs (e.g., Medicare and Medicaid), and federal and state laws (e.g., Affordable Care Act) are factors that will impact reform within dentistry. Insurance companies traditionally reimburse on restorative needs and procedure-based outcomes. Reimbursement in healthcare is shifting towards outcomes-based compensation and a focus on prevention. Further, lobbyists are pushing for Medicare and Medicaid to expand and cover oral health services. While there is a push towards these changes, Walker, Stevens, and Williams expressed that dentists and dental professional organizations will continue to resist these changes as long as possible to keep the hierarchical structure in dentistry and maintain control of the dental profession.

> If Medicare can get oral health integrated into what they're doing that will be the piece that's going to trigger lots of change which is also why you see, the ADA's (American Dental Association) fighting it so much because they're going to lose control over their business if Medicare starts paying for oral health and people can go wherever they want. You know, most of the older adults, a lot of them don't have dental insurance, so they're paying cash and that's, I think, favorable. (Stevens)

Presently, "those who can afford to pay for oral healthcare services are the ones who get it; thus, the ones who can obtain and maintain good oral health over their life course, and those who cannot are left behind" (Walker). Payment reform will impact patient care and patient access to treatment. It will also impact how dentists are reimbursed and affect the treatments dentists provide and offer.

Competing view of the future within self

While all faculty desired advancement and change within the dental profession in the future, five participants had conflicting views. Participants shared that they had polar viewpoints

based on what they would like to see (optimistic and idealistic view) versus what they think will actually happen in the future (pessimistic and status-quo view). Participants shared that they felt little to no change would occur in the dental profession and that healthcare would continue to advance without dentistry. They detailed that these dichotomous views are based on what they have witnessed and experienced throughout their careers.

> So that's a tricky question. Because I do think it's like what do you want or what do you think is going to happen? And I think those are two different things from my perspective, it will be sort of how I've seen people's careers evolve, I would say, over the last few years. (Williams)

The reasons they expressed the pessimistic view were due to historical learnings, the dental profession being siloed, and resistance to change from the profession. Walker details, "Unfortunately, I think what I envision, and this is just due to like a historical perspective, is dentistry will fight as long as they can to resist changes." Stevens discussed that the needle hasn't moved as much as expected during her career of 30 years in dentistry, specifically compared to other areas of healthcare. Ultimately, she shares the dental profession will either step up to the change needed to advance the profession or stay complacent.

> It, it's going to be interesting, because…I haven't seen the needle change as much as what I would expect it to change. When you look at other areas of healthcare, you've seen a lot more change over the last 30 years. I see where [dental professionals are] either going to step up [or not]. (Stevens)

Smith shared that she would not want the pessimistic viewpoint of little change in the future.

> This is a hard question for me because I'm a big picture and idealist person like I form big ideas, and I refuse to believe that they aren't possible. But I guess if I were to take my

> hopes out of it, and just explain what I envision, it pains me to say, I don't see a lot of change in the future. (Smith)

In summary, participants' vision of the future of dentistry consists of multiple scenarios stemming from what they'd like to happen versus what they think will actually happen. Their vision included having dental professionals be recognized and practice as healthcare providers, roles evolving within the dental team, impact of society and patient advocacy, and reform to payment and care within dentistry.

Research Question 2: What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists?

There were 68 tags eliciting participants' thoughts about who are future-ready dentists. The primary prompts to elicit responses for who a future-ready dentist were:

1. What three key competencies will be essential to practice dentistry in the next 30 years?
2. How would you define a future-ready dentist?
3. What priority area should dental education focus on to prepare dental graduates to succeed in this changing healthcare environment?

Table 4.3 reflects future-ready descriptors from the participants. The table includes only those descriptors that were identified from five or more participants. While a few faculty discussed technical skills needed to treat patients and deliver high-quality care, technical skills were not as prevalent as dispositions and other types of skills, such as communication skills. Based on the interviews with the participants, a future-ready dentist is a healthcare provider who is adaptable to the changing healthcare system, profession, and population, collaborative, person-centered, and a lifelong learner. They integrate technology, embody a growth mindset, and epitomize humanistic behaviors, including empathy, compassion, and inclusiveness.

Table 4.3

Future-ready dentist descriptors based on participant responses

	Clark	Harris	Marshall	Miller	Morgan	Reed	Smith	Stevens	Walker	Williams
Adaptable	■	■					■		■	■
Collaborative		■		■	■	■	■	■		
Person-centered	■		■	■	■	■	■			■
Lifelong learner		■		■	■				■	■
Integrates technology	■	■	■	■		■				■
Embodies a growth mindset				■	■		■	■	■	
Interpersonal communication skills			■	■	■	■		■		■
Personifies humanistic traits	■	■		■	■	■	■	■	■	

Five participants discussed that future-ready dentists are adaptable where they are flexible and able to navigate changes within the profession and healthcare system due to evolving dental approaches and technological advancements, population changes, and other changes that are yet to be known. Clark discussed that dental problems will largely stay the same; however, the approach to treating dental problems will change. Therefore, dentists should not "get stuck in old approaches" (Clark) and become adaptable to the evolving new treatment approaches. Miller further shares that the landscape will change within healthcare and dentistry, causing a need for adaptable future-ready dentists. "Dentistry is going to look a lot different than it did 50 years ago" (Walker) and the profession needs to be ready for a changing US population. Walker expands,

> If you are going to be ready for what's coming, you're going to need to understand that things will change and adapt, and you have to be flexible and adapt as well but there has to be that kind of intellectual curiosity about those changes. Otherwise, I think people do just get in their bubbles, and they stay there, and then they don't care. (Walker)

Six participants discussed that future-ready dentists need to be collaborative. Participants discuss that future-ready dentists need to practice interprofessional practice and "be trained in the [interprofessional education] process…and need to know how to practice together" (Harris) with healthcare professionals. Smith discusses dentists need to "rub elbows with other professionals" meaning that dentists should provide care alongside and in tandem with healthcare professionals. Participants discussed what professions they should collaborate with, which includes but is not limited to, medical doctors, nurses, physical therapists, occupational therapists, and counselors.

Seven participants discussed a future-ready dentist is person-centered. Part of being person-centered would include the dentist being focused "on the patient and not the production"

(Marshall). They would also be “able to work with the diverse community in which they serve” (Marshall). They should understand their community needs.

> I think a future-ready dentist would also be someone who understands their community needs, whatever community they're going to practice in. “Do the nursing homes around me have access to oral health care? Do the high schools in the area know that a dental school even exists close by? Do the people in rural environments know where they can receive care within a two-hour drive?” If you don't know all of those things you're coming to a game with half the deck, so I feel like there's just a real pigeon hold like “I'm in my little zone, this is where my family put me, this is where I grew up, this is what I see”, and the blinders there are what lead to uninformed decision making and the perpetuation of what's always been. (Smith)

Ultimately, a dentist who is person-centered would place the patient and community at the center of their care, offering multiple treatment options, and including patients in their healthcare decisions.

> So, I see a future-ready dentist is someone who does not approach every person with Cadillac-level dentistry treatment planning but maybe it approaches a person with a curiosity to determine what it is they hope to gain from their dental care. “Are you looking for a resolution of disease only? Are you looking for resolution of disease, plus increase in function? Are you looking for those two things plus aesthetics? What are we looking for here? And how can I meet you with my skill set because you yourself are an autonomous individual with thoughts and feelings and ideas, and not a subject on which I'm about to perform.” (Smith)

Reed further discusses that a “future-ready dentist is somebody who can function in the wider scope of health care, who is ready to engage when there is a public health crisis” (Reed). This readiness and practice of person-centered care allow dentists to help other professionals and provide the care needed for a patient at the appropriate time that is best for that patient.

Five participants shared that future-ready dentists are lifelong learners. A clinician’s education does not end after dental school; however, Walker shared,

> I think a lot of what I see is that a lot of students come here and they're like, “I just need to do both these four years to learn the skills I need to learn, to go into practice and make a lot of money. (Walker)

They should be willing to learn and “not have to have the same way to do something every time" (Williams). With the evolution of healthcare, technology, and population, dentists need to assess and determine what skills and areas they learned in dental school need to be updated, elevated, or no longer practiced because it is outdated. Their knowledge and skills also need to grow and they need to adapt as they progress in their career.

Six participants defined a future-ready dentist as integrating technology. They “can use the technology to deliver the highest quality and safest health care possible (Reed). Williams describes that to do this, they need to think critically navigating the rapid changes with technology. Technology integration includes the way dentists provide care and treatment through chairside delivery systems, 3D printing, computer-aided designs, and teledentistry.

Five participants shared that a future-ready dentist embodies a growth mindset. Participants detail being open-minded to the changes within the profession, healthcare, and population is part of a growth mindset. “They're open to new forms of practice, new venues for practice, new models of care. And then in the most simplistic way, I think it's probably a growth

mindset versus a fixed mindset" (Reed). They can think outside of the box about how patients receive and "pay for treatment" (Marshall).

Six participants defined a future-ready dentist as having interpersonal communication skills. Out of all the characteristics discussed for a future-ready dentist, communication skills were the only skillset at least half of the participants discussed. Ultimately, clinicians can communicate with patients, their team members, and across professions. They know how to "have difficult conversations with folks" (Reed).

Eight participants discussed that a future-ready dentist personifies humanistic traits. The humanistic characteristics include empathy, compassion, and inclusiveness. Walker described this is an important quality with "the US population changing drastically, and people need to be ready for that" (Walker).

> I think a future-ready dentist for me would be someone who had lots of education and training and cultural humility, understanding that people who look different from you may have different values or needs, and that the level of function and cosmetic acceptability could be different for different people groups. (Smith)

Research Question 3: What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists?

Determining how the profession needs to change is necessary to prepare and ensure clinicians and the profession are ready for the future. The primary prompts to elicit responses were:

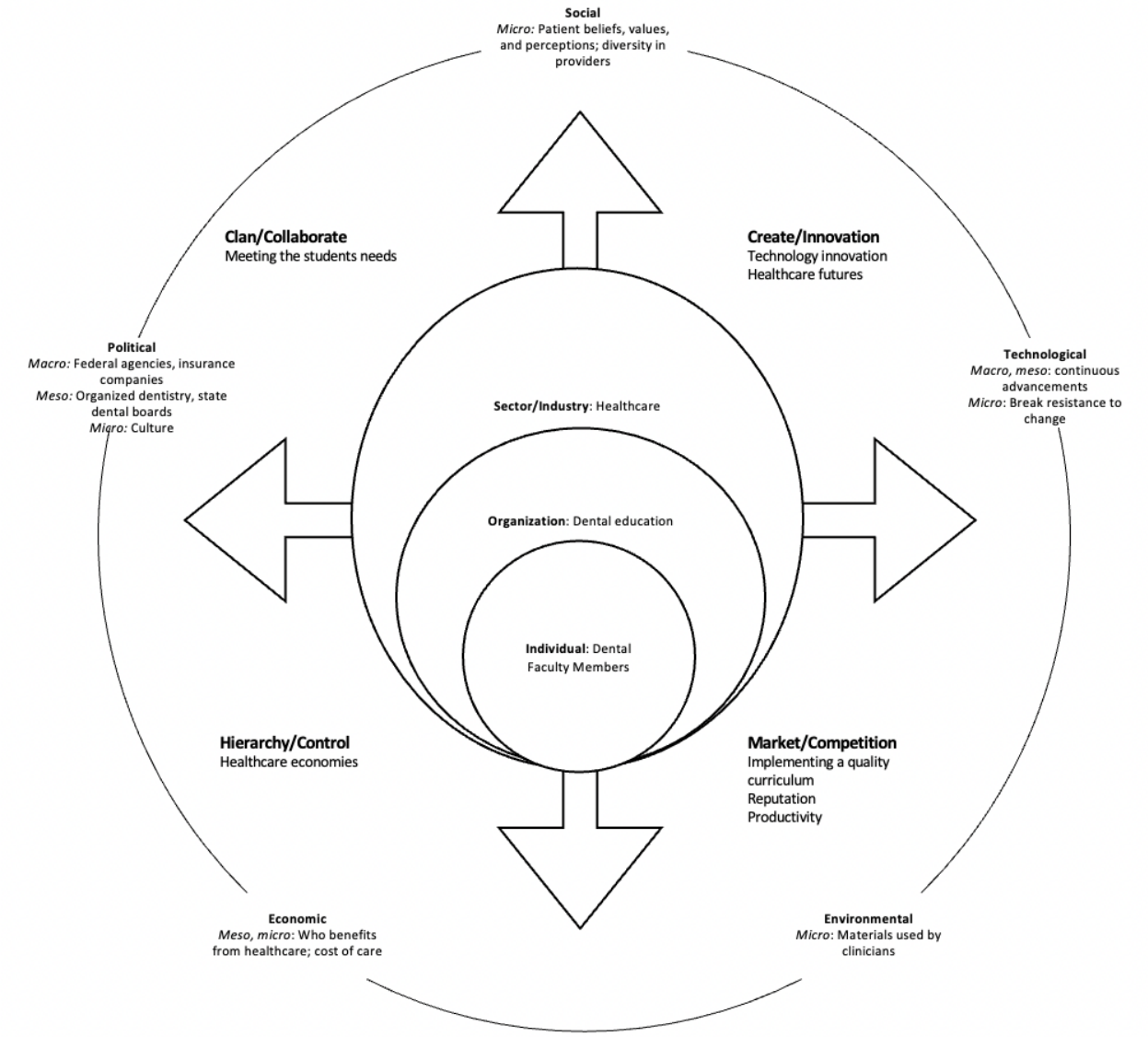
1. What forces influence your vision of the future in dentistry?
2. What factors will influence and impact dental education in the future?
3. Considering the healthcare trends you identified, what barriers may arise that dental educators need to overcome to integrate innovations in dental education?

4. What knowledge, skills, and dispositions do you consider most essential to teach dental students to ensure they are prepared for the future?
5. What areas do you believe you need more training in to adequately prepare for the trends, priorities, and barriers you have identified?

There were a total of 885 tags on changes needed to prepare future-ready dentists. These tags were further categorized to dental practice factors, dental education factors, codes on the knowledge, skills, and attitudes needed for faculty, and faculty preparation and development needs. I detail the changes the participants suggested that are needed within the dental profession to ensure future-ready dentists are developed and prepared, based on macro, meso, and micro levels along the social, technological, environmental, economic, and political dimensions. I then detail the emerging themes of changes needed within dental education. This includes internal and external changes in the profession along with the tension of stability and flexibility as seen by the competing values framework. Figure 4.1 displays these factors and changes based on the three theoretical frameworks grounding this study. I end by detailing what dental faculty need within their own professional development to prepare future-ready dentists.

Figure 4.1

Emerging factors impacting the futures of the dental profession based on theoretical frameworks



Changes needed in the dental profession

Changes need to occur for the profession to progress, serve as a place for clinicians to thrive, and create future-ready dentists. These changes are multifaceted and, if they occur, can provide future-ready dentists with a solid foundation to effectively collaborate within the dental profession and with other professions, integrate within the healthcare system, and provide

person-centered care. Participants shared that changes are needed across macro, meso, and micro levels, as reflected in Table 4.4. These factors indirectly and directly influence the dental profession and can support or inhibit dentistry moving forward toward the participants' vision of the future.

Table 4.4

Emerging themes of macro, meso, and micro changes needed in the dental profession based on Societal, Technological, Environmental, Economical, and Political factors

Category	Macro, meso, and micro influences
Societal	*Micro:* Patient beliefs, values, preferences, and perceptions
Technological	*Macro, meso*: Continuous advancements
	Micro: Break resistance to change
Environmental	*Micro:* Materials used by clinicians
Economical	*Meso, micro:* Who benefits from healthcare and who is left out; cost of care
Political/Policy	*Macro:* Federal agencies, insurance companies
	Micro: Organized dentistry, state dental boards, professional organizations
	Micro: Culture

From a societal perspective, patients' beliefs, values, preferences, and perceptions are driving forces for receiving and seeking medical and dental care. A patient's health literacy and understanding of dentistry based on past experiences, others' experiences, or misinformation informs and impacts their values and beliefs of the profession. Patients' perceptions of dentistry need to change, and dental professionals will need to determine how to mitigate this.

> I still think that society sees the dental profession as a way to make money and not as a way to improve health. I think a lot of people see going to dentist with "I have a problem, if I'm hurt, or I've lost a tooth, or I need to fix my smile", right. And I think if that perception could change, and you know, dentistry could really grow. (Williams)

Walker, Miller, and Clark discussed that with the profession and healthcare working towards resolving access to care issues and “treating diverse populations with diverse needs” (Miller), there is a need to ensure the providers delivering care are diverse and reflect the population. Clark also detailed there is a need for more providers to support the growing population. Further, dental professionals need to provide patient and population education on dental health. Dental professionals will need to demystify and debunk the population's misconceptions of dentistry. They will also need to mitigate consumer demand that is driven by the amount of information and misinformation in the world. Dental professionals can shape how society perceives dentistry and move away from fear-based reasons for lack of access.

> I think the more that dentistry can be that community outreach and sort of portal to healthcare…I think we could actually shape society and shape how society feels about dentistry, but also about medicine, because I think it's the less invasive way to monitor health in these individuals, and if we could, we could do that, then that would be better and now there's less fear-based reasons for health disparities. (Williams)

From a technological standpoint, dental professionals will need to reduce and break from their resistance to change and integrate new technology. Smith expressed, “there is kind of an aging group of people reluctant to use technology”. Reluctance of technology use stems from wanting to maintain the status quo and what traditionally worked within the profession. Clinicians need to become open-minded to trying new innovations that are evidence-based.

A focus on the number of materials used in dentistry is an environmental factor that the profession will need to consider how to reduce. Morgan was the sole faculty member who discussed environmental factors during the interviews. He shared that many people may not be thinking about environmental sustainability, but it is something to consider.

> [Environmental sustainability] might be something that we do experience in our practice lifetime: are shifts in materials, the way they're packaged, the materials themselves, the dental materials themselves, the way we deliver care might be with an eye towards environmental sustainability which is, I would bet, not on many people's radar, definitely less so than like the health system itself is. (Morgan)

From an economic perspective, financial rewards and who will ultimately gain monetarily are often driving forces for something to change. Smith shared an example of this:

> Everybody agrees that we want to reduce our emergency room visits except for the people that turn a profit on people who use emergency room visits. So, I'm like the people, if you measure emergency room visits as a secondary data source, are not getting their dental needs met, and that's what we can assume from that, or we can sift it to see that this is a way that hospitals can collect funding money, whatever you want to call it.

Based on this insight, the financial gains of the sector or organization could influence change or lack thereof. Further, if a patient is unable to afford care or insurance, then they will not seek out care. This can ultimately cause patients to not seek care unless an emergency. Federal agencies and insurance companies will also impact the participants' future vision. Marshall stated, "the insurance and payer whether that be state-issued like Medicaid, Medicare, Federal agencies, or independent insurance-type agencies that mindset would have to drastically change."

Economically, the dental profession will need to consider the cost of care for people to receive treatment. Miller shared that "we're looking at higher prices. We're looking at the cost and we see patients who don't have insurance, who can only afford out-of-pocket." Marshall shared an example from the food industry that translates to the dental industry regarding the cost of food and how that impacts health,

> If we think about the food industry for sure, if we could get the food industry to flip their narrative on what's healthy and what's not. But it's not even what's healthy and what's not, it's what's affordable because what's affordable is not healthy, and what's not affordable is healthy. And so, if we could flip that so that the focus is on purchasing those healthier choices that would ultimately affect us, you know, that would ultimately, I wouldn't say reduce the need for preventive care, but maybe it could help reduce the cost of restorative care in America.

The cost associated with care, just as with food, can impact what patients prioritize based on their financial means.

Politically, the dental profession's history of tradition and being siloed is one of the major factors inhibiting the progression of the dental profession. Dentistry will need to change by dismantling the tradition of dentistry and organized dentistry, including professional organizations.

> Organized dentistry will always be a strong force, you know, they might not be on the side of progress, but I mean, they will always have a really heavy hand in how this goes, because they hold so much lobbying power and power in general in the US. (Walker)

Dental state boards, dental professional organizations, and dental professionals influence the future of dentistry. They will either remain within the status quo and how dentistry has been in the past or will drive and push for change to integrate within the healthcare system and be primary care providers. Professional associations such as the American Dental Association (ADA) and American Dental Hygienists Association (ADHA) influence and can be drivers of change within the profession based on what type of legislation they push in the United States.

Individual states within the US also sway the advancement of the profession based on legislation and the people within the state who are clinicians.

> I'm coming from a paradigm that's very colored by my practice location. Our state has experienced quite a bit of setbacks in the way of practice advancement. I've seen a lot of that that is done within the schools influenced by legislation and by professional membership. So when I see groups of people practicing dentistry who are in two different professional camps and that they can't come to terms and agree on a future for dentistry and that the prevailing ideas of the dental association in my state are heavily influenced by those of retirement age, it leads me to see how those with a more antiquated viewpoint can influence the next generation, and then those will just rise up and perpetuate the same agenda. And if that happens in the professional association, I've seen that that translates to legislative standstill, which translates to funding decreases and lots of other things that can influence the end result in academia, as well. So, I mean, for lack of a better way to describe it, you might call it a good ole boy network, or like a good old boy, “we've always done it this way mentality”, and for as long as that continues, there are people who stand again from that and they like to gain from it. So, I worry that there aren't enough people who would combat that successfully to see it change in the future. (Smith)

Participants shared that fears and the resistance to change are also holding dentistry back. Williams further expressed how the profession seems to feel as if something is being taken away versus adding value to what they do.

> I think dentistry is operating from a sense of need and fear. I feel like the profession is so afraid that somebody is trying to take something away from their profession rather than

> integrating their profession, right, and being a part of a bigger picture that they just can't seem to get out of their own way. (Williams)

Some clinicians are resisting change and working to maintain the status quo because it serves the purpose of those who benefit from the past and current state. Walker explains,

> Unfortunately, I think what I envision, and this is just due to a historical perspective, is dentistry will fight as long as they can to resist changes, whether their market changes or policy changes or healthcare trend changes, because there is a very strong desire to maintain the status quo, because the status quo works very well for dentists in terms of financial compensation in terms of practice autonomy. It works very well for us as it is. So, there will be lots of resistance to changing how we practice, changing how we're paid, changing the expectations of us. (Walker)

Smith shares that while there are people working to make positive change within the profession, many either continue the path of least resistance or experience burnout.

> I feel like we continue in the patterns of least resistance, and that I observe quite a bit of complacency. I see that a lot of people who would strive to make that different experience a high rate of burnout. (Smith)

Ultimately, participants shared that if these barriers and factors are not addressed, the dental profession will remain in the status quo and not move forward towards the preferred futures.

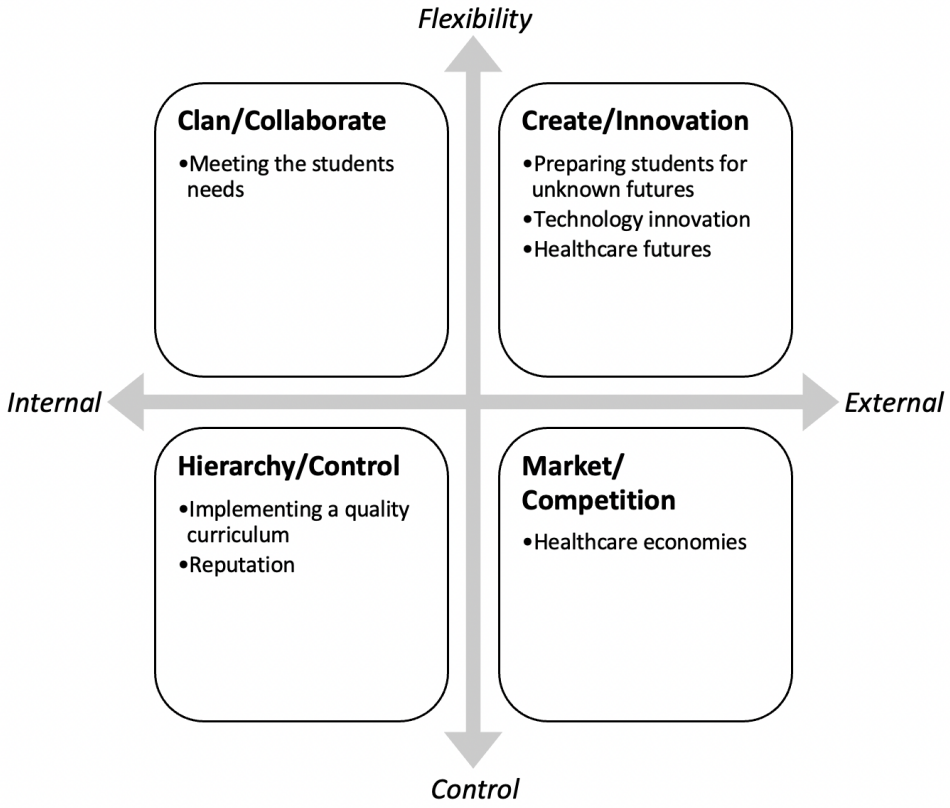
Changes to dental education

The participants emphasized that all the preparation and change to dental education will need to start in predoctoral dental education. Participants' responses resulted in competing values and tensions to maintain stability while also allowing for flexibility. The Competing Values Framework was a useful way to understand the challenges to changing dental education across

the two dimensions of flexibility/control and internal/external focus. As a futuring strategy, this four-quadrants approach allows for complexities of changes to be explored. Figure 4.2 reflects the emerging themes from the interviews on the considerations and changes within dental education to prepare future-ready dentists.

Figure 4.2

Themes according to the Competing Values Framework



One area dental education will need to consider is determining and meeting the students' needs. Participants shared this will include assessing the cost to apply and attend dental school, considering students readiness to learn, and navigating student preferences to learning. Several participants shared how there are barriers to applying and attending dental schools when it comes to cost, especially with marginalized communities. Dental education needs to "stop ignoring the affordability factor" (Smith) of dental school and provide additional opportunities to funds and

loaner payment programs to help dental students and reduce. Smith also shared that there is currently a “push get more dental providers that better represent the population but then the dental schools are pretty out of touch or inaccessible to populations that would better support representation” (Smith).

The next element of determining and meeting students’ needs is considering students’ readiness to learn. Each student is a multi-dimensional human being, coming from different backgrounds and facing various aspects in their life that can affect their ability and readiness to learn within an educational setting. These can include physiological needs, including food insecurities, homelessness, and other areas. Marshall shared,

> Our students don't come to us just as students. They come to us as parents and caregivers, and homelessness, food insecurities, poverty. They're taking showers at the gym. Our students are coming to us from all different walks of life, and every once in a while, they end up in your chair, in your office. And so how do you, how do you work with the psychology of that?

Another aspect is the student’s agency to learn and what their preferences are for learning. Clark discussed the constant revolving door of new students, which lends a change within the culture and changes in overall preferences. Walker shared how she has noticed changes in students’ expectations compared to previous students due to the current students spending much of their college education in an online environment due to the COVID-19 pandemic.

> Their expectations of having more flexibility in learning styles, learning schedules, having the ability to not attend class in-person, and be able to watch the recorded lectures in 1.5 or 2 time speed. How they want to learn is vastly different than how we've been

> teaching. So, we're definitely going to need folks to get support in how do we adapt to that? How do we meet students where they are so that we can still give them the education and training that we think they need but in ways that are current and support the ways they want to learn. (Walker)

Miller also expressed the need for educators to step back and reflect on how she is teaching if something is not working in the classroom.

> So, it could be the teaching style is not conducive to my daughter's learning style. It could be the way that I teach is not conducive to one or more of the 104 pre-doctoral students in my classroom. So, I have to have a variety [of teaching methodologies], a grab bag per se…just coming up with different types of educational methodology in ways to kind of reach all the, all those present in your classroom. So that everybody is able to retain the information in a way that's best for them. (Miller)

Dental education will then need to balance how to prepare students for unknown futures and embrace technology innovation and healthcare futures. The current students are digital natives who have grown up with "technology always present in their lives" (Harris), while the faculty are largely digital immigrants. This will be a culture shift for faculty and dental education, but an important one, according to the participants, to ensure students are prepared for the evolution and advancements in technology. Dental education programs will need to balance the changing environment within healthcare and prepare students for the unknown futures of healthcare and dentistry.

Another factor dental education will have to balance is the impact of healthcare economies. The way the dental profession transforms will impact how dental education programs and faculty prepare these students. Within this factor, participants expressed that students will

need to learn how to be fiscally and ethically responsible within the healthcare system and dental profession. Marshall expressed, “What does it mean to be fiscally responsible [and] ethically responsible at the same time? How am I prudent and fiscally responsible, yet ethical and treating the patient in a way that's standard of care.” Morgan continued by sharing,

> I think, foundationally, it would be good to have just more non-clinical coursework that is meaningful, delivered by folks who understand the system, who understand how Medicaid works, who understand how insurance works outside of a practice management philosophy and this is approaching it purely from the patient side of things, not the practice side of things. I think having that kind of foundation would be a really strong thing, as it relates to the system. (Morgan)

Implementing a quality curriculum while maintaining the program’s reputation is another factor dental education will need to address. Largely discussed by participants, dental education would need to try to minimize the packed curriculum, allow time for faculty to update and prepare didactic and clinical material, and provide administrative and institutional support. Pride will also need to be removed from faculty to work towards preparing future clinicians.

> It is on several levels from the administration, but also to the people who have to deliver the content they have to be flexible and willing. And I think this is why I think one of our biggest barriers is ourselves and our egos and our work ethic. (Williams)

There will also need to be a willingness to change from dental faculty members. Participants shared that they have experienced faculty who “are stuck in their fixed mindsets, “We've always done it this way, why are we changing?” (Morgan) mentality. Faculty will need to alter how and what they teach by not teaching to the past but instead teaching to the present and the future.

> The vast majority of faculty, specifically clinic faculty, which I think spend the most time with dental students, are mostly people who have joined academia after private practice careers were over…These aren't folks necessarily whose primary career focus was education. It was "I had my dental career, and now, in my later years or retirement years, I'm going to give back and impart my dental wisdom on current students." And I think that's admirable, but I think as we prepare dental students for the present and future, we need educators that have experience but are invested in teaching cutting-edge current concepts and preparing students for the future. We can't just focus on imparting past knowledge to current students because it's dated and I think that's one of my biggest frustrations in dental education. (Walker)

Six participants shared that accreditation would play a major role in meaningful change in dental education. Participants expressed that "if it's not a CODA standard, it doesn't change" (Marshall). Dental education will also need to ensure faculty have professional development, so they are prepared to teach and up to date on educational methodology.

Faculty preparation

The knowledge the participants considered as most essential to prepare predoctoral dental students for the future is staying current in the areas that they teach and having a foundation in teaching methodology. Four faculty discussed that faculty cannot continue teaching to the past and need to be up to date on current research and best practices. Faculty need "to connect the dot (and) help the student connect the dots between classroom and clinic" (Clark). Seven faculty discussed faculty need listening and communication skills. This included the ability to navigate difficult conversations and how to provide timely and pertinent feedback and debriefs to students and peers. Faculty need to be able to "take something very complex and break it down to

something simple" (Harris). Further, Williams shared that faculty need to be able to communicate in various ways to reach multiple students.

> I do think that you have to either learn or acquire skills to work with individuals who don't think like you and are able to then communicate something in multiple ways…There's not one teaching style or one way to communicate to 95 students, and so I think your ability to be able to do that when needed is probably the number one skill set. You can be as smart as possible but if you can't communicate that information to anybody, it doesn't matter. (Williams)

Another skill two faculty shared was the need to be a competent clinician and have experience in clinical practice if you teach within the clinics.

Out of knowledge, skills, and dispositions, dispositions were the most discussed for faculty to teach future-ready dental professionals. Dispositions included a willingness to learn, flexibility, adaptability, and patience. Eight faculty expressed the importance for faculty to be willing to learn and grow from themselves, students, and others. Smith shared that part of this learning is "aging out this "sage on a stage" mentality of teaching and "You come to my class because you want what I have" instead of "We are in class together to grow together" (Smith). This one example reflects how faculty remove their pride to allow continuous learning even within the classroom they are teaching in. Miller shared that this mindset of growth also integrates flexibility and patience.

> I think another thing is when you have so many years of experience and feel so knowledgeable on topic you have to take a step back and picture yourselves in the shoes of that learner, and realizing that even though when they ask a question, it may sound like something that's maybe not an important, or you know, not to say that it's not an

> intelligent question but that's where I kind of go with that. Being able to step back and reflect on where that learner is at that point in time, and kind of meet them where they are to help them grow and grasp the concept and the understanding. So, I think flexibility is key.

Four faculty discussed the importance of patience as a faculty member. “And they’ve got to have patience, and I don't think, if you don't have the patience, then you shouldn't really be teaching, because every learner is on a different path. Some get it quickly and some need more attention” (Harris). Seven faculty discussed the importance of being flexible and adaptable. The COVID-19 pandemic revealed the importance of being adaptable as faculty were required to quickly transfer their courses online and identify creative solutions to continue teaching their students.

All participants felt faculty need training and support to ensure they stay up to date on skills and research as well as provide the necessary and adequate education to prepare future-ready dentists. Participants shared a variety of training, including modalities and content, to ensure they can develop these skills. Informal and formal support is needed for professional development, including mentorship, workshops, programs, and standardized patients. The content should vary, including instructional design, educational methodology, and advanced education in dental topics.

Participants shared that many dental faculty do not have a background in teaching and generally do not receive support on this when first entering. They are expected to figure it out on their own and identify opportunities on their own. They spend a lot of their time figuring out how to be a course director and teach, and then if faculty are told to attend training on how to do this, frustration and resistance often occur.

> And so, because most of the time people are resistant to changing, is because they put all this work into preparing lectures, preparing in case-based, whatever they've prepared. And it was so much work because they didn't really have the skill set to do it in the first place. And now you send them to training, and you just told them, "You've just done all of this wrong, please redo it." (Williams)

Because of this, new dental faculty need onboarding on how to teach where "all clinicians have to go through some type of teaching program for three months or six months at the Institution and shadow someone who's seasoned before they can actually teach" (Harris).

Further, faculty ought to participate in a simulated space to practice various skills needed to teach, such as communication skills. Morgan discussed how he is part of research on leveraging standardized patient encounters to gain feedback and to hone the dispositions identified as necessary to teach future dental students by the participants.

Support for professional development is needed from the dental school, the institution, and professional organizations. School politics and administration play a heavy role and influence the development of faculty. Support from leadership within the school is critical for faculty to develop. Participants expressed a disconnect between the expectations and support not being consistent or set by the organization and even the institution.

> I think if they (the dental school) truly want the curriculum to be improved, and they wanted to better support their faculty, they would go the extra step and say, "Here are the resources, and our expectation is that across the board, all of our courses are going to mean to, are going to be current, we're going to update these things annually, and we're going to provide you within your work day dedicated or protected time to work on these things because they are important to us." I think the disconnect comes with, we're (dental

> faculty) made aware that these resources exist, we're made aware that these are best practices but the bar has not been set as to what the expectation is because I think they're fearful of setting that bar, because they know that they're not building in the support for us to follow through with it. (Walker)

While faculty need to take initiative in their development within their own institution, they also need time and space within their schedule to ensure they have the time to be creative and develop. Williams specifically shared that new faculty are the ones with the heavier teaching loads and often are not receiving support, time, or resources to advance in their career. She stated, “So I think you start with protected time, and you decrease that protected time as you move through your career” (Williams). Instead, she believes many institutions are doing this backwards and this should be flipped to ensure new faculty receive the support they need to learn how to be an educator.

This section highlighted the changes needed to create future-ready dentists that emerged from the interviews. Participants shared that those changes would need to occur across the sector of healthcare, the dental profession, the organization of dental education, and at an individual level of dental faculty members. Dental education will need to consider and balance the various external/internal and stability/flexibility tensions, including meeting the students’ needs to consider how to prepare students for unknown futures while maintaining a quality curriculum and program. To do all of this, faculty will need to be adaptable, patient, and willing to learn. They will also need professional development on teaching methodologies and the support of their administration to ensure they have the time and resources to grow as an academician and ready to prepare their students to be ready for the unknown futures.

Chapter Summary

This chapter shared the findings from this instrumental case study exploring ten U.S. dental faculty members' vision of the future of dentistry and what faculty will need to prepare future dental professionals. Findings were organized by research questions and then discussed based on emergent themes and subthemes within the research questions. The conceptual framework helped organize their discussions to get a broad sense of the complexities of change they were addressing and how those changes were felt across individual and social dimensions. Faculty's visions of the future included seeing dental professionals become healthcare providers, advancement in technology, evolving roles of the dental team, influences from patients, reform with payment and care, and competing views within themselves. To succeed in the future, a future-ready dentist is adaptable, a lifelong learner, collaborative, and person-centered. Potential barriers that may prohibit advancement within the dental profession include factors such as patients' values and beliefs, professional organizations, and resistance to change. Dental faculty need to be adaptable, curious, excellent communicators, and stay current within their field and educational methodology to prepare future-ready dentists. Faculty will need administrative and institutional support, time, and resources dedicated to faculty development to adequately prepare to train future dentists.

In chapter five, I examine how the findings connect to the previous research and the conceptual and theoretical frameworks underpinning the research. Additionally, I discuss the implications and recommendations for practice and future research.

CHAPTER 5: DISCUSSION

Despite changes within the healthcare system (e.g., expansion of new roles, technological advancements), the dental profession remains largely siloed and separated from the healthcare system despite rapid advancements in the healthcare system (Bailit, 2017; Bailit & Formicola, 2017; Leape et al., 2009). While the literature reflects historical views of the dental profession, recommendations from organizations and federal programs of the profession, and expert opinion pieces on the future of the profession, there is a lack of research on how dental faculty perceive the profession's future and what is needed for faculty to prepare future clinicians. This study allowed United States dental faculty members to reflect and share their visions of the profession's futures and what the dental profession needs to do to ensure the profession and clinicians are prepared for the future. This instrumental case study explored United States dental faculty members' vision of the future in dentistry and how dental faculty will need to prepare future-ready dentists. The research questions guiding this study were:

1. How do dental faculty envision the future of dentistry?
2. What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists?
3. What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists?

This chapter provides a discussion and interpretations of the findings. I also connect the findings to this study's conceptual and theoretical frameworks, offer limitations, and share recommendations and implications for practice and research. I conclude with a summary and my reflections on the research.

Summary and Discussion of Findings

The findings from this study include the vision of the future in dentistry, the definition of a future-ready dentist, and the changes needed for faculty to prepare future-ready dentists.

Faculty vision of the future

Six themes emerged on participants' vision of the future to address the first research question: How do dental faculty envision the future? The themes that emerged in their vision of dentistry's future were (1) dental professionals as healthcare professionals; (2) evolving roles of the dental team; (3) impacts of patient expectations and patient advocacy; (4) continuation of technological advancements; (5) payment reform; (6) competing views of the future within self. These findings provide insight into participants' awareness of trends within healthcare and dentistry and set the foundation to consider what is needed to prepare in the changing landscape of healthcare and dentistry. The participants' vision aligns with the current literature in dental education on the technological advances, evolving roles of the dental team, and value-based care, as well as aspects of professional development and mentorship. To date, there is no literature that specifically addresses the competing views of the future, what it means to be a future-ready dentist, and how to prepare future-ready dentists.

Dental professionals as healthcare professionals

The most prevalent theme was dental professionals as healthcare professionals, emerging from all but one interview. Participants expressed the lack of dental professionals not practicing to the top of their licenses and not truly practicing as they should as healthcare professionals. Often the focus is all about the mouth when, instead, it should be focused on overall health, how the mouth impacts the rest of the body, and how to work across healthcare to provide the best

patient care. Medical-dental integration and interprofessional practice were two emerging subthemes within this category.

Medical-dental integration is the collaborative efforts across medicine and dentistry to provide comprehensive healthcare to patients. The approach interconnects oral health and overall health, which the literature shows is historically separated (Bailit, 2017); however, oral health is becoming more integrated with overall health (Davis, 2000; Office of the Surgeon General, 2003; U.S. Department of Health and Human Services, 2000). Medical-dental integration allows for interprofessional, holistic patient care, which aligns with the Institute of Medicine (IOM) Committee on Quality of Health Care in America recommendations on the importance of meeting patient needs through patient-centered care and working in interdisciplinary teams (Greiner & Knebel, 2003; Institute of Medicine, 2001; Kohn et al., 2000).

Working collaboratively across healthcare teams was weaved throughout most of the interviews. There were various thoughts and examples on how best to work across healthcare professions, depending on the practice models. For example, Reed discussed dental practices moving away from standalone practices towards a dental practice connected to a medical practice. Stevens shared another practice model where dental professionals are placed within medical offices or health departments to provide holistic, collaborative care in one place. Participants shared that interprofessional practice includes many providers, including medical doctors, nurses, occupational therapists, physical therapists, mental health therapists, and social workers. Interprofessional education and practice is now an accreditation requirement in dentistry and other healthcare professions; however, how to implement these into healthcare education programs is not defined and varies (CODA, 2021; Glick et al., 2012). Participants discussed this gap in their interviews that they often see interprofessional education as dental

students merely working through a case study with other healthcare professionals. They would like to see dental students and other healthcare professionals in the clinics together, providing patient care and mirroring what this could look like in practice.

Evolving roles of the dental team

The second theme was the evolving and new roles within dentistry. Evolving and new roles will allow for the profession to continue advancing and prepare for other changes that are yet to be known (e.g., technological advancements). New roles are already emerging in healthcare, such as medical virtualists and clinical informatics (Bass, 2018; O'Brien & Mattison, 2016). These emerging roles in healthcare will soon trickle into dentistry and while participants did not express or ideate what those roles may be, they did express that it will need to happen within dentistry to ensure the profession best addresses the changing environment and work collaboratively with the healthcare system.

Further, current roles will need to evolve and expand. Participants shared midlevel providers as an example already occurring in multiple states ("Dental team careers," n.d.). For example, Walker shared that the impact she already sees from midlevel providers is already huge, and she sees this continuing to occur, aligning with what the literature currently reflects on midlevel providers (Sinkford, 2020).

Harris shared that dental hygienists and other team members are currently underutilized and left out of certain aspects of patient care. The profession needs to start using dental team members at the top of their license and, subsequently, expand existing team members' roles to better address access to care issues (Sinkford, 2020). For these roles to occur and expand, legislation changes across each state are needed (Sinkford, 2020), as well as a mindset change among clinicians. There are clinicians who do not want to see these roles expand and desire to

stay in the pre-existing hierarchy of dentistry. I discuss resistance to change further in the changes needed to prepare future-ready dentists below.

Impacts of patient expectations and patient advocacy

Patients are at the heart of future changes to practice. All the changes that occur should be considered with the patient at the center to ensure optimum patient care and outcomes. As seen in other aspects of society, patients have increasingly impacted directly and indirectly by the way dentistry practices (Rozier et al., 2017; Weintraub, 2017). Patients are now consumers of healthcare and will likely be driving forces to change within the profession. Like the literature, the participants shared that patients expect immediate services and results at a reasonable cost and exceptional value (Weintraub, 2017). Morgan shared how some pediatric dental offices are catering to accommodate the demand from a subset of the population. He has found that often these treatments are not evidence-based nor hold true value and benefit to the patient; but because there is demand, dentists are providing the services.

Person-centered care was a large part of the optimistic visions of the future from the participants. Person-centered care allows patients to be active participants in managing their health (Coulter & Oldham, 2016), and shares the decision-making for treatment (Price et al., 2015; Santana et al., 2018; Sharma et al., 2015). As Walker shared, patients desire to be included in their healthcare decisions and understand their health status. Clinicians engage in person-centered care when they treat patients as individuals by acknowledging the patient's knowledge, values, preferences, and circumstances.

Continuation of technological advancements

The fourth theme detailing the participants' vision of the future, technological advancements, addressed how technology continues to advance and impact healthcare.

Participants primarily focused on digital dentistry, electronic health records, and telehealth in the interviews. They mentioned haptic technology and artificial intelligence but did not expand in detail on how these technologies will impact and influence practice.

Digital dentistry is an expansive term that includes the application of any digital or computer-based technology that a dental clinician may use to examine, diagnose, or treat a patient. Dental faculty shared that clinicians are increasingly integrating and using digital dentistry within their practice, steering away from the traditional ways of patient care. Consistent with the literature, participants shared that electronic records allow a patient's health information to be readily shared and received across multiple healthcare providers (Weintraub, 2017). Electronic health records allow for communication and collaboration across healthcare providers and allow patients to receive their health information and access it any time they need to (Dugar, 2022; Weintraub, 2017).

Smith shared that the COVID-19 pandemic accelerated telehealth within dentistry, which is also noted in the literature (Islam et al., 2022). These appointments allowed patients access to dental professionals for advice and consults since dental offices were closed except for dental emergencies. There are certain procedures within dentistry that cannot be done through telehealth; however, participants shared that telehealth allows flexibility for patients depending on their needs and monitoring of their oral health.

Payment and care reform

The fifth theme, payment and care reform, focused on the changes that need to occur with payment and practice models. With the other changes happening, a system needs to be in place to ensure patients can receive optimal care and clinicians are adequately equipped and prepared to deliver that care (Wolf & Campus, 2021). Participants indicated that dentistry is not afforded to

all the population; rather, it is available to those who can afford it. The literature confirms the lack of access to dental care across the United States, especially among marginalized populations (Borsky et al., 2018; Call et al., 2014; Centers for Disease Control and Prevention, 2021). Participants shared there is a push from lobbyists to expand oral health services into insurance programs like Medicare and Medicaid while professional organizations and clinicians are fighting these changes. Even with these changes, the literature shows a low number of dentists accepting these types of insurances ("Reimbursement Rates for Medicaid," 2021). Ultimately, insurance companies dictate how doctors are reimbursed for and could be drivers for change within practice models.

As reflected in the literature (Hobbs, 2017; Oakes & Radomski, 2021; Rubmic et al., 2014), participants shared that the profession largely has a fee-for-service model where patients are charged for the number of services or procedures provided by the dentist. Non-profit organizations, in particular, are developing and advocating for a switch to value-based care (Centers for Medicare & Medical Services, 2021a; Hoff et al., 2012; Kaufman et al., 2019; Teisberg et al., 2020; Trombley et al., 2019). Value-based care offers an alternative payment model that focuses on prevention while emphasizing value and quality over volume, medical-dental integration, electronic health records, and personalized care, drawing on multiple themes emerging from the interviews. Participants agreed that prevention needs to become more of a focus within dentistry.

Competing views of the future within self

The sixth theme, competing views within self, addressed how the faculty envision multiple futures. The multiple futures represented two extremes, the future they'd prefer and like to see versus the future they actually think will happen even though they don't want it to. Futures

studies contend that the future is not single, rather it is pluralistic, allowing for people to envision and create preferred and alternative futures (World Futures Studies Federation, 2023). As discussed below, participants created multiple futures for the dental profession, with a focus on probable and preferable futures (Inayatullah, 2012) based on their experiences in the profession. The current literature on the future of dentistry largely focuses on the projected trends and does not involve what would happen if the dental profession remained stagnant or did not progress and lean into these advancements. This theme provides insight into where this subset of faculty is conflicted internally.

Defining a future-ready dentist

Defining a future-ready dentist addressed the second research question: What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists? Participants largely focused on dispositions when describing who they thought were future-ready dentists and what competencies would be needed to practice dentistry in the coming decades. A future-ready dentist is collaborative, person-centered, and adaptable to the changing healthcare system to deliver and improve high-quality care to the population. The evolving healthcare system will require professionals to be collaborative with interdisciplinary teams and engage in person-centered care (Bogetz et al., 2015; Leape et al., 2009; Price et al., 2015; Santana et al., 2018; Sharma et al., 2015) and ability to adapt to these changes (Formicola et al., 2018; Institute of Medicine, 2011). Additionally, future-ready dentists need to leverage and integrate technology, which allows tools for diagnosis, monitoring, and treatment while improving clinical outcomes, and coordinating care among healthcare professionals (Alotaibi & Federico, 2017). The participants further highlighted the importance of future-ready dentists embodying humanistic behaviors where they are empathetic, compassionate, and inclusive.

Changes needed to prepare future-ready dentists

The third research question, what do dental faculty believe are the needed changes to dental education to prepare future-ready dentists?, brought together the three theoretical and conceptual frameworks grounding this study. These changes span across the various levels of neo-institutionalism from the individual dental faculty members to the organization of dental education to the sector of healthcare. Changes within the dental profession were examined through the lenses of the social, technological, environmental, economic, and political factors from futures studies across macro, meso, and microenvironments. To capture these complexities, the four-quadrants futures approach (Inayatullah, 2008) embedded in the Competing Values Framework (Cameron & Quinn, 2014) provided perspectives on the challenges and tensions that exist as needed changes to dental education and the dental profession are explored.

Changes in the dental profession

The emerging themes on the changes needed within the dental profession to promote preferred futures are explored through societal, technological, environmental, economic, and political lenses. From a societal perspective, the dental profession will need to consider patient beliefs, values, preferences, and perceptions. The findings reflect the role society will play within the dental profession and, similar to the literature, participants shared that patients desire to be part of their healthcare decisions (Field, 1995; Weintraub, 2017). The literature further expands that patient values largely focus on esthetics (Weintraub, 2017). The next category of influences is technology, as discussed above. Next is the environmental impact, which was brought up by only one participant. While not as big of a focus as the other dimensions, environmental sustainability is starting to be considered within the profession (Duane et al., 2020).

From an economic standpoint, determining who will financially gain from healthcare is something several of the participants shared as an influence of change within the profession. Smith shared an example that everyone wants reductions to emergency room visits except for those who financially gain from people going to the emergency room. This leads to political influences, which is perhaps the biggest force for change to occur. If the people and groups (e.g., state dental boards, professional organizations) are not on board or advocating certain changes, it will be harder for the changes to occur. Across most interviews, participants shared segments of clinicians, state dental boards, and professional organizations are drivers of change. Smith expressed concerns within her own state that legislation does not move forward, and clinicians largely have a mindset that things should stay the same because it's the way it's always been done. These mindsets and aversions from people within the profession and organizations will factor in how dentistry moves forward. As discussed below, these themes embody neo-institutionalism, where sectors, institutions, organizations, and individuals all shape one another.

Changes to dental education

While change will need to expand across the profession, it will start with dental education. If dental education does not integrate within their programs space and time to consider and prepare for probable and preferable futures, then it will be more difficult to have future-ready dentists in the workforce. Themes for this emerged from the tensions of competing values, as discussed below. One theme of note was meeting the students' needs. Participants shared that dental students graduate from dental school with massive debt. A 2022 survey on graduating dental students shared that the average dental school debt was $286,200 (Istrate et al., 2022). While this is the lowest average debt in the past five years, participants discussed this

financial burden on clinicians can impact how they practice, where they practice, and what types of positions they choose (e.g., clinical vs academic).

Another area of change is faculty teaching to the past and how they were taught, even if they were a student decades ago. Further, predoctoral programs do not always allow for teaching to the present and the future. This causes clinicians to then practice as it was in the past or finding different ways to learn new technologies and other trends through corporate education or other types of education, rather than starting to learn a skillset while they are in dental school. Participants shared that for change to occur in predoctoral programs, the accreditation standards need to change. From their experience, participants expressed that while individual faculty will attempt to make meaningful change to prepare future-ready dentists; however, it can be difficult to sustain within the curriculum if it is not an accreditation standard.

Faculty preparation

Participants expressed faculty need to be patient, lifelong learners, and adaptable to teach future-ready dentists. Faculty need to be competent in educational methods, assessment, feedback, curriculum and evaluation, the healthcare system, and professionalism (Chuenjitwongsa et al., 2018). While there are a variety of factors that determine the effectiveness of a program, having appropriately educated faculty that design, implement, and continually improve the program is critical to success (D'Antonio et al., 2013).

The preparation and culture shift suggested by participants within dental education is similar to what nursing education has implemented. Nursing education has responded with several programs implementing a shift in the culture allowing faculty the opportunity to take risks without penalty and providing the necessary resources and faculty development opportunities to engage in curriculum innovation (D'Antonio et al., 2013). Multiple publications

have echoed faculty needing adequate time, support, and training to engage fully (Elangovan et al., 2016; Haden et al., 2010). Dental school administrators' engagement is critical to ensure faculty are supported and have the resources dedicated to supporting their faculty (Greiner & Knebel, 2003; Licari, 2007).

Interpretation of Findings

The study's findings on faculty members' vision and perceptions of support needed to prepare future-ready dentists revealed new insights on what it means to be a future-ready dentist and what factors influence perspectives of the dental profession. The participants shared various experiences and perspectives on the dental profession and future-ready dentists. The study's findings highlight the need for dental professionals to be ready for a changing profession and be willing to learn while the organization, dental education, needs to provide a space to allow for these changes and teach towards the future rather than teaching to the past. The emphasis is not necessarily on what dentists do but instead on how they do it (e.g., models of care) and who influences this (e.g., professional organizations, state boards, clinicians).

The study's findings highlight that advances in the sector – healthcare - will continue with or without dentistry. If dentistry continues to be predominately siloed from healthcare and remains stagnant, other healthcare providers and professions will step up and fill the gap needed to help improve health outcomes and provide preventive dental care for the population. Other healthcare providers, along with technology and new practice models, will be disruptors of the field. The healthcare sector, the dental profession, professional organizations, and healthcare professionals will need to remove preexisting notions and come together to navigate the evolving system and provide holistic care to the population.

Dental education will need to provide dental faculty opportunities to develop in their teaching and clinical skillset to ensure they can create opportunities for future dental professionals to be ready for the future. Similar to how participants defined future-ready dentists, dental faculty should be willing to learn and adapt. For faculty, this indicates willingness to be challenged from students and have a shared learning experience in all educational settings through a growth mindset. Faculty also need to engage in faculty development to grow their clinical skills and knowledge, as well as learn best practices in teaching and engaging learners. This is multifactorial, where the individual needs to have that readiness and the time to do this. Individuals need support from their dental school to ensure they have time within their contract for development. The institution and dental school are integral for developing and providing these developmental opportunities. All of this will take a multilevel approach, from the individual, organization, and sector, to create these probable and preferable futures of the profession and allow faculty to prepare future-ready dentists.

Discussion of Findings and Conceptual and Theoretical Frameworks

Futures studies, competing values framework, and neo-institutionalism support this research study, as discussed in chapter two. Each framework has elements connecting to one another, making them ideal for this study. I briefly describe how the conceptual and theoretical frameworks informed my findings in this section.

Futures Studies

Futures studies is an academic discipline exploring the plurality of futures (World Futures Studies Federation, 2023) and was a central framework throughout this dissertation. Findings indicate that participants envision multiple different futures happening. Ultimately, these futures fall into three options: (1) maintaining the status quo and being left behind in healthcare; (2)

integrating with some aspects but not in others or integrating slowly; (3) fully integrating with healthcare, including legislative changes, support from professional organizations, and engagement with other healthcare professionals. The first scenario is an example of a probable futures, while the second and third scenarios are the possible and preferable futures and part of participants' optimistic views of the future.

The factors for what changes are needed within dentistry emerged and aligned with the driving forces Social, Technological, Economic, Environmental, and Political/Policy across macro, meso, and micro levels. Futures studies use the STEEP categories to ensure comprehensive perspectives of the future are explored. Each driving force was prevalent throughout most of the interviews except environmental. Morgan was the only participant to discuss how clinicians should be more aware of the profession's impact on the environment and consider the number of materials used.

Competing Values Framework

Competing values framework (CVF) was prevalent throughout the findings as the participants discussed various factors that will influence the future. Ultimately, the dental profession's effectiveness is dependent on navigating multiple competing priorities (Quinn & Rohrbaugh, 1981). The emergent themes for the changes needed to prepare future-ready dentists capture the tensions of CVF, reflecting the axes showing dynamics across internal and external tensions and individual/flexibility and stability/control tensions. One area in the display that stands out is between the top right of meeting the student needs and the bottom right of healthcare economies. These competing qualities reveal the contradictions and test the dental schools' and dental faculty members' ability to navigate multiple competing priorities while attempting to maintain stability and be adaptable.

Neo-institutionalism

Neo-institutionalism layers how individuals, organizations, and sectors fit with one another and are influenced by one another. It also factors how the macro-, meso-, and micro-environments impact the relationships between the sector, organization, and individuals. In this study, individuals are dental faculty members, the organization of interest is dental education, and the sector is healthcare. The findings reflect how each layer will influence and impact the futures of dentistry and how macro-, meso-, and microenvironments are shared across the driving factors of social, technological, economic, environmental, and political dimensions in futures studies. Neo-institutionalism also explores how organizations fit within and are shaped by an institution and social sector. In this study, the findings showed how society impacts the dental profession and how the dental profession may influence society. Further, the participants shared how dentistry currently is within the healthcare sector, sharing how the profession is predominantly siloed.

Neo-institutionalism explores how individuals, external forces, and social forces are influenced by organizational behavior (Hu et al., 2017; Scott, 2001). Participants shared that dental practices are changing from a 'cottage industry' to mainstream health providers within medical centers or multi-site practices (Guay et al., 2014; Wolf & Campus). From an organizational theory perspective, this finding increases the industry constraints on change and how individuals within an organization are impacted by how the organization is set up. Participants also shared that individuals and the dental profession are resistant to change. This can dampen innovation and the ability of the dental profession to change within the healthcare sector, which involves isomorphisms and external constraints.

Limitations

While the research offers insights into the futures of the dental profession and what will be needed to ensure faculty are prepared, it has several limitations. One limitation was the potential for sampling bias using purposeful and snowball sampling. The way participants were recruited and selected may not represent the entire population and lead to faculty recommending potential participants who are more like themselves. Another limitation is the findings are not generalizable; however, the goal of this research study was to gain depth and breadth of faculty on the profession versus generalizing the findings. Further, a common limitation of qualitative research is the lack of transferability. This study focused on a small subset of dental faculty representing participants from only five states and with the majority being females. The study represents the trend currently happening within the dental profession and dental education where there is an increasing uptick in female providers and educators. There are also more female versus male dental students within many predoctoral programs across the United States. Further, this research only gains the perspective of only a small subset of dental faculty members. This research does not consider other stakeholders, such as dental school alumni, clinicians, and current students, which will be beneficial in future research. Lastly, this type of research relied heavily on my interpretation of the data, which can introduce subjectivity and bias. This limitation was addressed in chapter two.

Recommendations and Implications for Practice

This dissertation explored dental faculty members' thoughts on the future of dentistry, the knowledge, skills, and dispositions necessary for future-ready dentists, and the changes needed to dental education to prepare future-ready dentists. It is important to understand the perspectives and experiences of dental faculty members when considering the dental profession and what

changes are needed to ensure dental faculty members can prepare future-ready dentists. The findings have implications for predoctoral dental programs, faculty, administration, and the broader dental profession. In this section, I offer recommendations and implications for practice that emerged from this study.

The first implication for practice is on adapting and continuous improvement to predoctoral curriculum development. Predoctoral programs should continually evaluate and adapt their curricula to align to prepare future-ready dentists, the evolving dental practice, and the emerging trends within healthcare and dentistry. Flexibility is needed within curriculum design to accommodate the evolving profession, the changing dental practice models, and the needs of the population. Curriculum change will also involve dental faculty members. As evident from the findings of this study, programs have faculty members who are skeptical or do not embrace change. This will be something dental education programs need to overcome to ensure they graduate future-ready dentists. Further, this study's findings indicate that most of what happens in a predoctoral program occurs because it is an accreditation standard. Accreditation standards will need to change for programs to ensure change occurs within their curriculum.

A second implication of practice is on person-centered care and interprofessional practice. Future-ready dentists will need opportunities during their time in a predoctoral program and as a clinician to work alongside other disciplines and healthcare professions. The findings from this study and within current literature reflect much of interprofessional education is within the classroom. Opportunities for interprofessional education and practice is necessary within clinical and community settings.

The third implication is on mentorship and professional development for faculty members. Many faculty in dentistry are experts in the field yet have no experience in teaching

and are left navigating the academic system and developing a course on their own. Onboarding programs for new faculty and subsequent faculty development should include sessions on how to teach and best practices in education. Dental schools should also establish mentorship programs if they do not currently have one. These mentorship programs can help faculty grow and remain engaged in their teaching roles. Findings from this study reflect the importance of administration to support professional development initiatives, provide the resources for these programs, and ensure faculty have the time to engage in these initiatives.

In conclusion, these recommendations emphasize the importance of adaptability, technological proficiency, a patient-centered approach, and a focus on values, beliefs, and cultures across faculty and administration in dental education. By implementing these suggestions, dental faculty members can better prepare future-ready dentists for the dynamic landscape of dentistry and healthcare.

Recommendations for Future Research

This dissertation has provided valuable insights into dental faculty members' perceptions of the future of the dental profession and the changes necessary to ensure they can prepare future-ready dentists. However, with the lack of research in this area, there are a variety of potential areas for future research. This study is considered the beginning step to determining the trends for dental education and preparation needed from the dental faculty member's perspective.

While the primary focus was determining how dental faculty need to prepare, and their voices are central to this, it would be beneficial to gain the perspectives of students, dental school alumni, current dental professionals, other healthcare providers, and patients through semi-structured interviews. Learning these varying perspectives will give insight into the different

stakeholders of healthcare and can allow a more holistic view of the change that will be needed to ensure future-ready dentists are prepared and can adapt to the evolving healthcare system.

Future research should include a Delphi method with dental faculty members. This type of research has begun in the nursing profession, where McPherson and Candela (2019) conducted a Delphi study to understand the nursing faculty's learning preparation better and the need to teach future nurses. Dental education should replicate this type of study to expand and deepen the findings from this study on what is needed to teach future dentists.

For any predoctoral program that is new or making future-forward changes within their programs should conduct research and share what they have planned, how they are implementing, and how the changes have impacted and changed future clinicians. Research for this can include comparative studies from the former curriculum to the new, quality improvement research, and longitudinal research.

Future research may also consider policy and implementation research on the development, design, and evaluation of changed and new policies within dental practice and dental education. Neo-institutionalism and competing values framework can continue to be the guiding frameworks within this research. Conducting this type of research can continue to inform how individuals, organizations, and sectors influence one another and assess the potential impact of these policies.

Dissertation Summary

This dissertation consisted of five chapters: introduction, literature review, methodology, findings, and discussion. The first chapter, the introduction, introduced the rationale for conducting this study, including the statement of the research problem, the purpose and research questions of the study, an overview of the theoretical and conceptual frameworks used, and the

research methodology. At the end of chapter one, a list of defined terms essential to the study was provided. The second chapter, the literature review, provided a thorough review of the literature on the historical and present state of the healthcare sector, dental profession, and dental education. It also detailed the three theoretical and conceptual frameworks guiding this study: futures studies, competing values framework, and neo-institutionalism.

The third chapter, methodology, detailed the study design and analysis used for this study. It also detailed my positionality and shared the ways the study ensured rigor and trustworthiness. In summary, this instrumental case study explored how ten dental faculty members across five states envisioned the future of the dental profession and what changes are needed in dental education to prepare future-ready dentists.

The overall research questions guiding this study were: (1) How do dental faculty envision the future of dentistry? (2) What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists? (3) What do dental faculty believe are the needed changes to dental education, including their own professional development, to prepare future-ready dentists? Chapter three addressed how these questions were to be answered by the data generated through the interviews.

The fourth chapter, findings, shared the emergent themes based on research questions. Dental faculty envisions multiple futures depending on how the profession responds to internal factors (e.g., clinicians' resistance to change, dental professional organizations) and external factors (e.g., legislation, insurance providers, patient’s values and beliefs). Participants' visions included medical-dental integration, interprofessional practice, person-centered care, advancements in technology, and payment and care reform. Participants defined future-ready dentists as adaptable, lifelong learners, collaborative, and person-centered.

The fifth chapter, discussion, summarized, discussed, and interpreted the findings from the study. The conclusions of this study provide insight for dental faculty members, administrations, and dental education programs on the future of dentistry and what changes are needed to ensure dental faculty members and dental education programs are prepared to teach future-ready dentists. This chapter also discussed the recommendations and implications for practice and research.

Research Reflections

As I come to a close on my doctoral journey, I am filled with gratitude and an immense sense of accomplishment. As I reflect on these 5.5 years in this program, I appreciate and am filled with gratitude for the amount of personal and professional growth I have gained. I have been able to apply what I have learned from my professors and peers in the classroom to my career, personal life, and this dissertation. Regarding the dissertation process, I appreciate the in-depth knowledge and skills I have acquired from this research and the potential impact it can have on the dental profession, clinicians, dental institutions, and dental faculty. I was drawn to faculty development and how to prepare students for life after graduation before beginning this program. When I learned about futures studies through my coursework and, subsequently, neo-institutionalism and competing values framework through my chair, I realized the intersection these conceptual frameworks had with one another and how they can guide this research.

The dissertation journey has been a profound learning experience for me. My conversations with the participants were insightful and thought-provoking. Over the past few months, I found myself in conversations with other people at work and realizing the connections from what I was learning from the participants to these conversations. These learnings are not just from the findings themselves. I have learned to be patient with myself, taking it one bite-

sized piece at a time. It has bolstered my understanding and value in persistence and communicating what I need to complete this process, specifically setting dedicated time to write.

Having a baby during my time in the program was not my initial plan when I began this program, especially having an infant at the start of the dissertation phase. There were times when self-doubt crept in and I did not think I would make it to this point in my dissertation journey. However, I also reflect on the times over this phase on the small wins that would happen in this process alongside having a newborn. I now could not think of a better way to have experienced the long hours of analysis and writing, the ups and downs of the process, and the small wins that amounted to the culmination of this point. I am forever grateful to my chair, who wasn't fazed and immediately was excited for me when I said "I'm pregnant" and talked through a plan of action; to my husband, who encouraged me in times of greatest self-doubts; and to all of my professors, peers, family, and friends who supported me.

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APPENDICES

Appendix I: Recruitment Letter

IRB #: 25732

Dear (enter participant's name):

I am a doctoral student in the Educational Leadership, Policy, and Human Development department at NC State University. I received your contact information from (insert appropriate answer, i.e., online, recommendation). I am currently completing my dissertation, which explores how the dental profession and predoctoral dental education may change in the future and how dental programs can best anticipate those changes. I am particularly interested in your perspective because you are teaching in the predoctoral dental program and have been engaged in planning how to teach future students. I am soliciting participation from dental educators who consider themselves "futures-oriented" or innovators in the dental education arena.

Given your experience in and commitment to the future of dental education, I would like to request your participation in this study by completing a virtual interview. The interview will be conducted via Zoom. The interview will ask a series of open-ended questions about your perspective of the future trends, possible scenarios, opportunities, and challenges in dentistry and dental education, as well as what preparation, support, and resources faculty will need to teach future dental professionals. The interview will be recorded and will last between 45 to 90 minutes.

There are minimal risks associated with participation in this research. The study's procedures are not considered risky, and the interview questions will focus on your personal experiences. Before the interview, you will be reminded that you can stop the interview at any time and skip any question. All direct identifiers will be removed from transcription and data analysis. There are no direct benefits to your participation in the research. The indirect benefits

include contributing to the literature and research that will inform the future of dentistry and dental education and prepare future dental healthcare providers to adapt to the changing healthcare system.

I have attached the consent form to this email which details the study and your involvement. We will discuss the consent in your interview, where I will ask for your verbal consent. Please feel free to reach out if you have any questions or concerns.

I appreciate your time and consideration, as this research will help guide dental education programs to prepare future dentists. If interested, respond to this email with the completed consent form. From there, we will identify a time for the interview.

Sincerely,

Beth Kornegay

Appendix II: Consent Form

Title of Study: Future-Ready Dentists: An Instrumental Case Study of Dental Faculty's Perceptions about the Future of Dentistry

eIRB # 25732

Principal Investigator(s): Beth Kornegay, [redacted]

Funding Source: None

NC State Faculty Point of Contact: Dr. Jayne Fleener, [redacted]

Collaborating Researchers: None

What are some general things you should know about research studies?

You are invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty. The purpose of this research study is to explore how the dental profession and predoctoral dental education may change in the future from the perspective of dental educators. It addresses the following questions: (1)How do dental faculty envision the future of dentistry? (2) What do dental faculty feel are the important knowledge, skills, and dispositions for future-ready dentists? (3) What do dental faculty believe are the needed changes to the dental education, including their own professional development, needed to prepare future-ready dentists? We will do this through a Zoom interview to discuss your projected changes for the dental profession and dental education.

You are not guaranteed any personal benefits from being in this study. Research studies also may pose risks to those who participate. The risks of this study are minimal. Your identity will be protected, and any identifiers that might allow others to identify you will be withheld in

research reports to ensure your anonymity. You may want to participate in this research because of your expertise in dental education and your commitment to the future of dental education. This research will add to the growing literature on preparing future practitioners. You may not want to participate in this research if you do not feel comfortable sharing your thoughts on the future of dentistry.

Specific details about the research in which you are invited to participate are contained below. If you do not understand this form, please ask the researcher for clarification or more information. A copy of this consent form will be provided to you via email from the researcher and discussed at the time of the interview to obtain your verbal consent. If, at any time, you have questions about your participation in this research, do not hesitate to contact the researcher(s) named above, her dissertation chair, Dr. M. Jayne Fleener (mjfleene@ncsu.edu) or the NC State IRB office. The IRB office's contact information is listed in the *What if you have questions about your rights as a research participant?* section of this form.

What is the purpose of this study?

The purpose of the study is to explore how the dental profession and predoctoral dental education may change in the future from the perspective of dental faculty members.

How many people will be in the study?

There will be approximately 10 to 15 participants in this study.

Am I eligible to be a participant in this study?

In order to be a participant in this study, you must agree to be in the study, must be current dental faculty members at an accredited dental school, and teach in the predoctoral program. Participants do not need to be a dentist.

You cannot participate in this study if you do not meet the inclusion criteria.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to do all of the following:

1. Participate in a Zoom (virtual conferencing) interview about thoughts on the future of dentistry and dental education and the faculty preparation needed. The interview will be audio-recorded, and all identifying information will be removed from data analysis.
2. Provide feedback to portions of the transcript, as needed, to ensure your thoughts and ideas are captured appropriately.
3. Participate in a potential brief follow-up conversation for clarification.

The total time you will participate in this study is 60-90 minutes.

RECORDING AND IMAGES

As a part of this research, I will ask for your consent to audio record you at the beginning of the interview when I also obtain your verbal agreement to participate in the study.

RISKS AND BENEFITS

There are minimal risks associated with participation in this research.

The study's procedures are not considered risky, and the interview questions will focus on your personal experiences. Before the interview, participants will be reminded that they can stop the interview at any time and skip any question. Furthermore, should this occur, all direct identifiers will be removed from transcription and data analysis.

There are no direct benefits to your participation in the research. The indirect benefits include contributing to the literature and research that will inform the future of dentistry and dental education and prepare future dental healthcare providers to adapt to the changing healthcare system.

RIGHT TO WITHDRAW YOUR PARTICIPATION

You can stop participating in this study at any time for any reason. To do so, just stop any research activity you are doing or contact the researcher, Beth Kornegay, at [redacted]. You can also contact the faculty advisor for this research, Dr. Jayne Fleener, at [redacted].

If you choose to withdraw your consent and stop participating in this research, you can expect that the researcher(s) will redact your data from their data set, securely destroy your data, and prevent future uses of your data for research purposes wherever possible. This is possible in some but not all cases.

CONFIDENTIALITY, PERSONAL PRIVACY, AND DATA MANAGEMENT

Trust is the foundation of the participant/researcher relationship. Much of that principle of trust is tied to keeping your information private and, in the manner, I have described to you in this form. The information that you share with me will be held in confidence to the fullest extent allowed by law.

Protecting your privacy as related to this research is of utmost importance to me. There are very rare circumstances related to confidentiality where I may have to share information about you. Your information collected in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety. In other cases, I must report instances in which imminent harm could come to you or others.

How I manage, protect, and share your data are the principal ways that I protect your personal privacy. Data that will be shared with others about you will be de-identified.

De-identified. De-identified data is information that at one time can directly identify you, but that I will record this data so that your identity will be separated from the data. I will have a master list with your code and real name that I can use to link to your data. I will ask you to select a pseudonym before the interview and change your name in the Zoom session before recording begins. Therefore, your name will not be associated with the recording or transcripts. When the research concludes, there will be no way your real identity will be linked to the data I publish.

Future use of your research data

To help maximize the benefits of your participation in this project, by further contributing to science and our community, your de-identified information will be stored for future research and may be shared with other people without additional consent from you.

Compensation

There is no compensation for participating in this study.

WHAT IF YOU HAVE QUESTIONS ABOUT THIS STUDY?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact the student researcher, Beth Kornegay, at [redacted]. You can also contact the faculty advisor for this research, Dr. Jayne Fleener, at [redacted].

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB (Institutional Review Board) office. An IRB office helps participants if they have

any issues regarding research activities. You can contact the NC State University IRB office at IRB-Director@ncsu.edu, 919-515-8754, or fill out a confidential form online at https://research.ncsu.edu/administration/participant-concern-and-complaint-form

CONSENT TO PARTICIPATE

By providing verbal consent, I am affirming that I have read and understood the above information. All of the questions that I had about this research have been answered. I have chosen to participate in this study with the understanding that I may stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I am aware that I may revoke my consent at any time.

Appendix III: Interview Guide

IRB# 25732

Title: Future-Ready Dentists: An Instrumental Case Study of Dental Faculty's Perceptions about the Future of Dentistry

Time of interview: **Date:**
Place: Zoom

Thank you for agreeing to meet with me to learn about your thoughts on the future of dentistry and dental education and the preparation needed for dental faculty. The information you share with me in this interview will be used to develop faculty development opportunities and for research purposes.

Interview Process:
The interview process will be as follows:

1. Before the interview begins, we will review the IRB Consent Form and discuss any questions you may have about the research.
2. Once you have consented to be interviewed, we will begin the audio recording. The recording will be used for analysis purposes.
3. A series of open-ended questions will be discussed. The questions will focus on the future of dentistry and dental education and how to prepare faculty members. A copy of the questions will be sent to you beforehand as we are scheduling the interview.
4. In addition to the audio recording of our discussion, I may also be taking notes as you speak.
5. The interview will last about 60 minutes.

Review of consent:
Verbal Consent Script

> *You were provided a consent form for this study in a previous communication. Given your expertise and work in dental education, you were invited to participate in this qualitative study. There are minimal risks to participating in this interview. Data will be de-identified following the interview.*
>
> *Do you have any questions?*
>
> *If you decide not to participate in the study at any time, the interview will end and any information you have shared will not be used in the study. You may also refuse to answer specific questions without prejudice.*

My contact information and my faculty advisor's contact information are provided on the consent form previously sent to you if you have questions or concerns.

Do you consent to participate in this research and be audio-recorded?

Interview Questions to Participants:

Category I – Future of Dentistry

6. When you think about dentistry in the coming decades, what do you envision?
7. What changes do you think will occur in present-day dentistry in the future?
8. What three key competencies will be essential to practice dentistry in the next 30 years?
9. What forces influence your vision of the future in dentistry?
10. How do you think society will influence the dental professional?
11. Based on your professional experience, what healthcare trends have or will majorly impact the dental profession?

Category II – Future-ready dentists

1. How would you define a future-ready dentist?
2. What priority areas should dental education focus on to prepare dental graduates to succeed in the changing healthcare environment?
3. What factors will influence and impact dental education in the future?
4. Considering the healthcare trends you identified above, what barriers may arise that dental educators need to overcome to integrate innovations in dental education?

Category III – Faculty Preparation

1. Tell me how you were prepared to teach current and future dental professionals.
2. What knowledge, skills, and dispositions do you consider most essential to teach dental students to ensure they are prepared for the future?
3. What areas do you believe you need more training in to adequately prepare for the trends, priorities, and barriers you have identified?

Closing Questions

1. What else should I be thinking about?
2. What should I have asked you that I did not?
3. Is there anyone else you think I should be interviewing?

"Thank you for your time in this interview. You have been invaluable in sharing your insights as a dental educator and faculty member. Please let me know if you want a copy of the transcription. I will also follow up with an email with any additional questions, as needed."

Appendix IV: Figure Copyright Permissions

Figure 2.1. Five scenarios for dental education in 2026

Figure 2.2 Scenarios from ADEA Leadership Institute integrated into aspirational futures

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Sep 02, 2023

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Will you be translating?	No
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Institution name	North Carolina State University
Expected presentation date	Oct 2023
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