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The Making of a Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Environment

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**THE MAKING OF A PROFESSIONAL:
HOW DENTAL HYGIENE EDUCATION IS
PREPARING FOR A CHANGING HEALTHCARE
ENVIRONMENT**

by

CONNIE ELIZABETH BEATTY, RDH

**2008, B.S DENTAL HYGIENE
TEXAS WOMAN'S UNIVERSITY**

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Master of Science
Dental Hygiene**

The University of New Mexico

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DEDICATION

This thesis is dedicated to Michele Darby RDH, MS, a visionary leader to whom the profession of Dental Hygiene will forever be indebted. You envisioned our potential as a profession, and have worked tirelessly to move us forward.

Thank you!

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Like raising a child, obtaining a major achievement such as a graduate degree takes a village, or at least a strong team of people. Without the support of many key individuals, I could not have gotten this far.

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THE MAKING OF A PROFESSIONAL:

HOW DENTAL HYGIENE EDUCATION IS PREPARING FOR A

CHANGING HEALTHCARE ENVIRONMENT

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ABSTRACT

This study sought to identify educational methodologies utilized by dental hygiene programs that might orient a student towards an occupational or professional model of practice as described by Darby and Walsh. Through the use of an original theorem, Darby and Walsh's model was applied to dental hygiene education. An electronic survey queried 334 entry-level programs regarding strategies utilized to develop critical thinking within clinical and didactic courses. Faculty demographics were analyzed for relationships between institutional setting and methodologies utilized. Frequency counts and chi-square analyses revealed much variation in methodologies utilized. Statistical significance was noted in the lack of orientation towards research values within programs awarding associate degrees. Additional research is needed to generalize these conclusions to the population of dental hygiene educators at large; furthermore, establishment of the reliability of the original theorem utilized in this study would generate guidelines for best practices in development of critical thinking skills.

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CHAPTER I

INTRODUCTION

Twenty years ago, Darby and Walsh introduced the idea of a knowledge-based dental hygienist, a professional who assumed responsibility for patient-centered actions and was actively involved in the decision making process of care. They postulated that such a professional must be grounded in a scientific knowledge base instead of solely relying on technical abilities to make evidence-based decisions regarding patient outcomes.[1] Seven years prior, the American Dental Hygienists' Association (ADHA) had begun issuing calls for entry –level practitioners to hold a baccalaureate degree,[2] a recommendation that was met with fierce opposition by many dental hygiene educators within two-year college settings. That recommendation was not influenced by the desire for dental hygienists to hold a higher degree merely for the sake of titles or professional prestige; ADHA recognized that to sufficiently build the knowledge base Darby and Walsh would later describe, a program of study resulting in a baccalaureate degree was essential.[2]

Today, three hundred thirty-four dental hygiene programs exist to develop and train entry-level dental hygiene professionals, of which only fifty-four offer a baccalaureate degree.[3] As research continues to reveal associations between oral and systemic health, and the development of innovative technologies and resources improve, dental hygiene programs are faced with the challenge of integrating the emerging new material into an already packed curricula.[4] Curricula constraints challenge even the most creative leader, and with little

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effort, the focus can easily shift from knowledge-based problem solving skills to the tangible technical abilities required for licensure. The way a program defines its relationship with its students and their vision for what their graduate should be dramatically influences the type and degree of professionalism exhibited by its graduates. The foundational education a dental hygienist receives will largely determine the trajectory of their professional career.

Statement of the Problem

The purpose of this study was to assess and evaluate the components of dental hygiene education that contribute to the development of a dental hygienist operating within an occupational model and compare those attributes with educational strategies that produce a dental hygienist functioning through a professional model.

Research Question

Based on a pre-defined list of occupational and professional characteristics within dental hygiene education, what is the prevalence of educational methodologies oriented towards the Occupational Model versus the Professional Model?

Hypothesis

There is a difference in the type and number of educational methodologies utilized by faculty members who work in programs awarding associate degrees versus baccalaureate degrees.

Significance of the Problem

Modes of health care delivery have been rapidly changing to meet the ever-increasing crisis of access to care in this country. The demand is high for professionals who can think critically, make evidence-based decisions, and assume responsibility for collaborative decisions with today's wellness-oriented client. As qualified health care professionals, dental hygienists have increasing opportunities to assume a bigger role as a member of the inter-professional, primary healthcare team in promoting oral and systemic health. The tradition for dental hygiene education has been to prepare students to become private practice clinicians, targeting the middle-class, insured patient. Such clinicians have been prepared with strong technical abilities but have been conditioned to defer responsibility for care and decision making to a supervising professional. Educational standards for dental hygiene, as defined by the Commission on Dental Accreditation (CODA), presuppose that a dental hygienist will be qualified to function in a variety of healthcare settings based on the clinical and community oral health exposures a student receives. However, the Standards do little to stress the development of critical thinking abilities necessary to function as a practitioner in alternative settings. Higher-level thinking and analysis of ideas comes, in part, through the merging of research principles, adult learning theory, and active learning strategies- philosophies that must first be embraced by the teacher before the pupil can adopt them. The underlying values and attitudes of dental hygiene educators towards the profession and its responsibility to society, as translated through educational philosophies and methodologies, will have a

stronger impact on a graduate's career trajectory than a plethora of clinical rotations sites.

What is needed is an oral health professional who applies a strong research knowledge base to critically analyze risk, independently determine the process of care, and evaluate outcomes accordingly. In conjunction with objective C.1 of the National Dental Hygiene Research Agenda (ADHA, 2007),[5] this study sought to answer the question of what dental hygiene curricular components are currently contributing towards producing generations of dental hygienists who embrace the responsibility and challenge of an evolving healthcare climate; conversely, by determining what elements of instruction take away from proactive professional development, transformation and growth can then occur. The sequence of creating a proactive professional does not happen overnight; neither does the process of evaluating the "method behind the madness." Through assessment and analysis of the aforementioned problem, this study will be a first of many steps in moving dental hygiene education forward in the professional model.

Operational Definitions

Active or Experiential Learning: A process of learning that engages the participant (student) through multiple modes: reading, writing, talking, listening, and reflecting. [6]

Alternative Practice: Any venue for dental hygiene employment, clinical or non-clinical, taking place outside of the private practice dental office.[7]

Associate or Certificate Dental Hygiene Program: Any dental hygiene program that offers an Associate Degree or Certificate of Dental Hygiene upon graduation; excludes all programs offering higher degrees; may be located at a community college or technical institute as a public, for-profit or private institution; degree plans are generally limited to ninety (90) credit hours or less.

Baccalaureate Program: Any dental hygiene program that offers a Baccalaureate Degree upon completion and graduation; usually housed within an accredited four-year college or university setting; may be a public or private institution; degree plans stipulate more than ninety (90) credit hours are required for graduation- usually between one hundred twenty (120) and one hundred forty (140).

Client: According to Darby and Walsh, "Denotes the recipient who is the central focus of the dental hygiene process of care."[8]

Critical Thinking: The reflective process of asking questions, seeking and analyzing information, and formulating a justifiable, logical conclusion; the resulting outcome of critical thinking then bridges the gap between scientific understanding and practical application via problem solving skills.[9, 10] When applied in a clinical setting, critical thinking translates into clinical reasoning.[11]

Dental Hygiene Program, Accredited Program, Program: Used interchangeably to indicate an active dental hygiene educational program recognized by and in good standing with the Commission on Dental Accreditation (CODA).

Dental Hygiene Student, Student: Used interchangeably to indicate an individual who has matriculated into an accredited dental hygiene program and is actively progressing with a defined dental hygiene curriculum.

Dental Hygiene Program Director, Program Director: Indicates the individual(s) charged with the administrative responsibility and oversight of a dental hygiene educational program; responsible for coordinating decisions concerning dental hygiene curriculum, faculty, students, and facilities.

Entry-Level Dental Hygienist: A newly graduated and licensed dental hygienist, with one (1) year or less of working experience.

Occupational Model: The first component of Darby and Walsh's conceptual model, which outlines characteristics of a dental hygienist that are technically based. Such a dental hygienist functions as an auxiliary of the dentist, carrying out delegated tasks of lesser importance, and relies on a somewhat rigid regimen of oral health procedures, appointments, and protocols for determining care.[1]

Problem Based Learning (PBL): A student-centered model of learning that incorporates cooperative, team learning and student self-reflection on the learning process. Core components of PBL are student-centered learning, collaborative, cooperative learning, small group learning, critical thinking, and problem solving. PBL is usually focused on developing such skills through analysis of clinical cases and student reflection exercises.[12]

Professional Model: The second component of Darby and Walsh's conceptual model. Here, the dental hygienist is defined as operating from an established, research driven knowledge base. Through this conglomeration of critical thinking

skills, evidence-based decision making abilities, and the embodiment of professional responsibility, the dental hygienist is able to function autonomously as a holistic minded clinician, increasing the public's access to care as an inter-professional member of the primary healthcare team.[1]

Proprietary or For-Profit Schools: a for-profit educational institution primarily devoted to offering vocational or trade education; also known as "career colleges," courses of study usually result in a certificate or associates degree.

Self-Directed Learning: "The ability to direct and regulate one's own learning experiences." A "learn by doing" approach. [9]

Service Learning: A form of active, self-directed learning where the student's learning objectives are integrated with service opportunities to the community in a reciprocal relationship between the school and the community. Service learning promotes long-term community responsibility and engagement in the student, while simultaneously addressing societal needs and improving education.[13]

Assumptions

- The type of program of study and degree earned upon completion affect the paradigm orientation.

    o An associate or certificate program will be oriented towards an occupational model.

    o Programs located in for-profit institutions will be oriented toward an occupational model.

    o A baccalaureate program will be more closely aligned with a professional model.

- The type of program and degree earned highly determine the entry-level hygienist's career trajectory.

    o An associate or certificate program subconsciously inhibits its dental hygiene students by promoting the role of a private practice clinician as the ultimate goal.

    o A baccalaureate program promotes a vision of global influence and inspires its students to look beyond the starting point of private practice to the plethora of alternative employment settings, including but not limited to community health, hospital-based (institutional) care, research-oriented environments, business, and governmental venues.

Limitations

- The study was designed to examine the initial, undergraduate dental hygiene education, and thus purposefully excluded components relating to bachelor-degree completion programs, as well as graduate education.

- As a descriptive study, findings were limited to self-reported observations from program directors, full-time faculty members, and adjunct faculty members who were lead course instructors within the dental hygiene program.

- Because the population equaled the sample, true randomness in sample selection and response rate could not be achieved with this study.

- The survey resulted in nominal and ordinal data outcomes, which minimized the strength of the statistical analysis.

- This study reflected the prevalence of current educational methodologies utilized and did not provide a comprehensive perspective on past or proposed program changes.

- By its nature, this survey had limited flexibility to measure depth in the participant's responses.

- There has been no formal research conducted using Darby and Walsh's Occupational and Professional Conceptual Models; therefore, the findings from this study are incomplete in and of themselves. Additional research is required to establish validity, as well as clinical significance.

Methodology

Using a descriptive survey, dental hygiene program directors, fulltime faculty members, and adjunct faculty members who were lead course instructors were queried regarding a number of different topics pertaining to dental hygiene education. An electronic survey was utilized as the research instrument and participants were invited via email communication. A monetary incentive for survey completion was attached to the invitation for participation. The Institutional Review Board of the University of New Mexico approved all research activities prior to participation engagement.

CHAPTER II

LITERATURE REVIEW

Introduction

Current State of Oral Health Care in America

In the sea of American healthcare, oral healthcare is a broken fish net: more people fall through the gaps than are caught. In 2012, U.S. census data estimated the country's population to be more than 313 million people;[14] of those numbers, one-third of the population, over 100 million people, have not seen a dentist in the last year.[15] The complexity of dental care delivery and utilization is influenced by a myriad of factors, starting with the personal values of the client, followed by numerous financial and non-financial considerations. Financial obstacles, specifically dental coverage or the lack thereof, has often been cited as the primary barrier in the struggle to access oral health care.[15-20] It remains one of the biggest predictors of dental utilization.[15-20]

Yet, for those experiencing financial difficulties, non-financial barriers are often simultaneously present, further compounding the issue.[21] Kullgren, McLaughlin, Mitra, and Armstrong (2012) discovered that among American adults, 21 percent reported a greater inability to receive immediate dental care due to challenges of accessing the healthcare system, the availability of services and providers, and/ or the client's perceptions of characteristics of the services, facilities, and providers as being relevant to their needs, as opposed to 18 percent whose chief complaint listed financial concerns.[21] As a result, dental care

becomes limited to palliative emergency room treatment instead of comprehensive, preventive care.[22,23]

Many individuals including those working within federal agencies, educators, clinicians, and public health experts are recognizing that the current "system" of receiving dental care via the private office is fragmented and too many people are falling through the cracks with unmet oral health needs.[15-23] Low oral health literacy has long been identified as the primary contributor to society's inadequate values on preventive dental care.[15, 20, 24] That lack of prioritization leads health economists to argue that because society has yet to see the value of the money spent on preventive care, less than 3 percent of all the money spent on health care expenses goes towards preventive services.[25,26] Interestingly, the founder of dental hygiene, Dr. Alfred Fones, stated in the early 1900s that although hundreds of million of dollars in public and private funds are expended to restore the sick to health, only a relatively small portion of this amount is spent to maintain the health of well people, even though it is definitely known that the most common physical defects and illnesses are preventable. The vital point is that dental hygienists have not commenced to cover the possibilities of true prevention.[27] This is particularly enlightening to see that prevention has still not materialized as a routine, compulsory health care practice. To the public, preventive health efforts are less exciting, harder to do, require more behavioral change, may conflict with personal beliefs, and professional advice is often inconsistent.[28]

This presents a sizeable challenge for health care providers, specifically oral health care professionals. To change societal perceptions regarding prevention, professionals must first be oriented towards a prevention-minded paradigm of care instead of the traditional medical model of disease management. To emphasize preventive care is to operate under the mentality of focusing on risk. This applies a broader, public health-like approach to individual care and is a much more arduous task to undertake.[28] Risk assessment and management requires greater critical thinking abilities to assess and analyze the client's influencing risk factors; a strong understanding of the process for evidence-based decision making when devising an intervention; and taking personal responsibility for the applied strategies. A risk-minded, preventive approach also assumes that one provider does not possess all the answers, and thus relies on a team approach of inter-professional care, recognizing that risk assessment and management evaluate total health, not compartmentalized functionality. Risk assessment for a health professional can be a learned trait, but changing established patterns of practice can be difficult and are often incomplete in their transformation. The best methods for creating health care professionals who are preventive minded, critical thinkers should start with their formal education from its inception.

Addressing the Gaps

The Commission on Dental Accreditation's *Accreditation Standards for Dental Hygiene Programs* assumes responsibility for ensuring that all dental hygiene programs produce graduates competent in general education,

biomedical sciences, dental science, and dental hygiene science before

assuming a role as an oral health practitioner (Standard 2-8). [29] In describing the

intent of teaching dental hygiene sciences, the Standards go on to state that

"dental hygiene sciences provide the knowledge base for dental hygiene and

prepares the student to assess, plan, implement and evaluate dental hygiene

services *as an integral member of the health team* ([italics added] Standard 2-14

Intent)."[29] Other Standards elaborate on the need of competency in evaluating

scientific literature as part of the decision making process; providing oral health

education and overall health promotion as part of the process of care; delivering

care to diverse ages and populations, including those with special needs;

applying ethical reasoning and decision making skills; and demonstrating

professional responsibility in all aspects of the process of care.[29] These

guidelines create the vision for educating dental hygienists who are well prepared

to identify the risk status of any vulnerable population and appropriately apply an

evidence-based process of care to alleviate the risk.

The American Dental Hygienists' Association has long recognized the

need for a well-rounded, research-based, entry-level curriculum. As experts and

leaders in the profession have continually voiced their concerns with the current

model of dental hygiene education,[4, 29-33] they have simultaneously partnered

with private and public stakeholders to produce transformation. September 2013,

a coalition of educators, public health practitioners, advocates, and business

leaders in health care, termed "The Santa Fe Group," convened to discuss the

future of dental hygiene education as it relates to health care at large. Prominent

questions addressed in the proceedings centered on past and future roles of the dental hygienist in healthcare, particularly in primary care settings; additionally, the question was posed, "What changes are needed in the dental hygiene education curriculum to better prepare dental hygienists to provide care in a rapidly evolving health care system?"[34]

Current State of Dental Hygiene Education

In the milieu of healthcare reform, the collective group of dental hygienists and dental hygiene educators has often been overlooked until now. The current healthcare climate is necessitating that educational programs evolve towards a primary care, prevention-oriented model. While dental hygiene education consists of the rudimentary knowledge base and technical skills to embrace this challenge, the profession has inhibited itself from moving forward because of a devaluing of the importance of research and the role of a risk-focused, process of care approach. In return, current educational practices have developed clinicians with strong technical skills but lacking the supporting critical thinking and problem solving abilities. Low standards of entry into the profession, as evidenced by the allowance of a certificate or associate degree for licensure, remain a huge roadblock for addressing the oral health crisis of care in this nation.[4]

Currently, both an Associate's degree and a Bachelor's degree are accepted for entry into the dental hygiene profession.[3] Of the 334 accredited dental hygiene programs in the country, only 54 offer a baccalaureate degree.[3] In the last two decades, the number of new dental hygiene programs has risen by 60%[3], yet only two of them have been baccalaureate-offering programs. The

option of pursuing an associate degree may entice many due to the reduced time required to obtain a degree, and the equitable outcomes of job security and financial compensation when compared to a baccalaureate degree holder.[30]

State standards have limited all associate and certificate programs to a stringent number of credit hours they can require for a degree, regardless of institutional setting. For two-year programs, that usually falls at 90 hours or less. Yet, those programs have still been held to the same accreditation standards as baccalaureate programs regarding courses and clinical clock hours necessary to graduate entry-level dental hygienists.[4] Baccalaureate programs are allowed more flexibility with credit hours for a degree plan, ranging from 120-140 hours. The increase in the number of hours allows a dental hygiene program opportunity to spread out core competency material among multiple courses, in addition to developing a deeper scientific base and stronger critical thinking skills.

Due to their time (credit hour) constraints, associate programs heavily emphasize the development of clinical abilities in order to achieve passing rates for regional and national licensing examinations.[4] Consequently, a devaluing of a strong, scientific, research base and well-developed critical thinking skills occurs, resulting in a short-sighted vision of the dental hygiene professional.[31] Leaders and experts in dental hygiene have voiced their concern that this myopic focus on clinical abilities is insufficient, and even detrimental to the profession.[4,29-33] Hence, the quality, not the quantity, of dental hygienists entering the professional workforce is problematic. Dental hygienists cannot adequately meet the demands

of an evolving healthcare system without a solid research- based armamentarium of critical thinking skills, normally developed through a baccalaureate degree.[29-33]

One particular venue offering an associate's degree in dental hygiene is the proprietary or for-profit institution. The entrance of proprietary programs into dental hygiene education has exacerbated the crisis of entry-level degree standards. At large, proprietary schools compose almost 20% of all associate degrees and produce roughly 23% of all health-related degrees.[35] Their explosion of growth is fueled by a desire to cater to strong markets of non-traditional students.[35] A successful business model is seen in how they quickly "clone" programs because of the lack of traditional university ties such as expansive campuses, tenured faculty, and extracurricular options for students.[35] While proprietary programs, or "career colleges" as they are often called, do meet a need in increasing the number of individuals with a credible degree and marketable skills, their aggressive recruiting tactics often mislead students into believing they can achieve a fast-track to success without mention of the cost or challenge involved.[36]

Some proprietary institutions market the fact that their dental hygiene program can graduate students in as little as 17 months.[37] Governmental scrutiny has revealed that graduates of proprietary programs possess extravagant amounts of student loan debt, are more likely to default on federal student loans, and are less likely to find employment in their chosen field after graduation. While all dental hygiene programs must be accredited by CODA in order to be operational, ultimately, these schools possess the potential to be an educational

"dead end" because many lack the regional accreditation and prerequisite college courses that most institutions require in order to transfer credit in pursuit of higher degrees.[35, 36] The trend has been for proprietary schools to establish themselves in urban settings where existing dental hygiene programs are located; as a result, the job market becomes quickly saturated with dental hygiene graduates who all possess technical ability but lack professional abilities to see the address picture of oral health care.

"Alternative practice" is the term used to describe environments outside of a private clinical office where a dental hygienist might find employment.[7] The American Dental Hygienists' Association identifies six overarching roles a dental hygienist is qualified to assume, the result of foundational skills imparted in the educational process.[38] In addition to the well-publicized role of a clinician, a dental hygienist may also undertake leadership positions within education, administration, research, public health, entrepreneurship or business.[38] Many organizations, entities, and companies utilizing dental hygienists for clinical and non-clinical positions require a baccalaureate degree as a necessary credential for employment, recognizing that such a candidate has had additional opportunities to develop critical thinking and problem solving skills.

While dental hygiene programs include discussion of the multi-faceted opportunities within the profession of dental hygiene, educational practices tend to focus on preventive principles in theory and disease management in reality.[27] A truly preventive approach must incorporate a public health perspective: it necessitates in-depth critical thinking skills to analyze and address risk on

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individual and population levels.[26] The integration of community health and research principles across the dental hygiene curriculum significantly contributes to the development of a preventive-minded, professional approach.

Defining Professionals

The definition of a professional depicts one who possesses a distinct body of knowledge; utilizes a specialized skills set to earn a livelihood; conducts himself by a code of ethics unique to his discipline, acts autonomously to formulate decisions; and is regulated by his own profession.[1, 39,40] While such qualities are utilized to progressively guide a profession as a whole, they also influence professional interactions on a personal level. From ADHA's own statement of beliefs, "Dental hygiene is an essential component of overall health care and we [dental hygienists] function interdependently with other health care providers. . . We are individually responsible for our actions and the quality of care we provide."[41] Dental hygienists are considered to be health care professionals who target oral health as a means of contributing to total health promotion and disease prevention.[41] Principles of dental hygiene care build upon the fundamentals of risk assessment and management, strategies that comprise core components of any health discipline. The weight of this responsibility then dictates that specific professional perspectives and actions define dental hygienists.

Occupational versus Professional Model

Darby and Walsh addressed this burden in their conceptual model of the Occupational versus the Professional dental hygienist.[1] This model is significant

for multiple reasons: it operationalizes the dental hygienist's functioning paradigm; it addresses the responsibility of the dental hygienist to one's self, the client, and other professionals; and it provides a potential solution to the crisis of access to dental care.[1] While personality and experience are contributing factors, the formal training a hygienist receives will chiefly influence one's tendency towards a specific paradigm.

The Occupational Model, as defined by Darby and Walsh, is a conceptual model based on technical competence.[1] The dental hygienist focuses mechanical abilities on disease management as defined and delegated by the supervising dentist.[1] Procedural care is routine, uncomplicated, and considered trivial; recall appointments are predictable; and perspectives towards the client are paternalistic because the dentist is responsible for oral health outcomes.[1] The practice of dental hygiene is deemed risky if unsupervised; therefore, organized dentistry assumes responsibility for close regulation and influence on the private and public practice of dental hygiene.[1] Ultimately, dental hygienists become glorified "teeth scrapers," with little to no ownership of the actions of their care or responsibility to the clients they are serving.

The opposite of a dental hygiene technician is a dental hygiene professional, the second component of Darby and Walsh's theory. The Professional Model is grounded in the belief that everything a dental hygienist does is derived from a solid, scientific research base.[1] A research base promotes critical thinking and problem-solving abilities as the dental hygienist uses a process of care system to seek the overall wellness of the client.[1] The focus then

shifts to a proactive risk assessment and prevention strategy instead of a

reactive disease management approach.[1] Because the dental hygienist assumes

personal responsibility to the client, prevention-oriented care is highly valued and

appointments become personalized, based on the need of the client.[1] The oral

health care professional is considered to be a co-therapist member of the primary

care team, and thus is not limited to private clinical practice as the only venue for

employment.[1] By looking beyond private practice as the only answer to clients

accessing care, the dental hygienist assumes a visionary, proactive role in

providing a solution instead of compounding the problem.

Application to Dental Hygiene Education

What is striking about these two models is that dental hygienists

functioning out of both paradigms are provided the same foundational knowledge

base and skills set with their formal training. The distinguishing mark between

one career trajectory and the other is *how* that knowledge base and skill set is

imparted. The National Dental Hygiene Research Agenda includes an impetus

for educators to "evaluate the extent to which current dental hygiene curricula

prepare dental hygienists to meet the increasingly complex oral health needs of

the public."[5] While dental hygiene educational research has often examined

various components of assessing competency and professionalism, few have

examined dental hygiene curriculum as a whole. One viable solution is to apply

Darby and Walsh's Occupational versus Professional model to dental hygiene

curriculum as a means of analyzing contributing factors in the development of

dental hygiene professionals. A logical way to evaluate the most effective

strategies that prepare graduates for leading efforts to integrate oral health into society, is best accomplished by studying these strategies; through a macro-level analysis of dental hygiene methodologies, educators can identify and embrace strategies for advancement of the profession. Dental hygiene education must rise to the challenge of adaptation and change; without transformation, the crisis of care will only increase and the weight of the problem will threaten to crush the few existing provisions.

Conclusion

The burden of oral health care in America has been spread thin. The pervasive influence of low oral health literacy in society has influenced the entire system of how oral health care is provided. Preventive care is undervalued. Gaps exist in the current system that leave many with few or no options for care. With a rising number of individuals lacking third party dental coverage, privatized dental services are failing to meet the needs of the masses.[18-20] Financial and non-financial barriers inhibit many from receiving preventive oral health care, resulting in inappropriate utilization of resources for dental pain relief.[15, 22, 23] On the basis of their formal training, dental hygienists are well qualified to step into this healthcare predicament as a professional member of the primary health care team. Yet, apprehensions exist among dental hygiene educators and leaders alike that perhaps dental hygienists are not as well prepared for public health approaches to care because of a lack of critical thinking skills.

Standards for dental hygiene education prepare an entry-level hygienist to demonstrate technical competence but mechanical skills alone will not address

the dilemma of access to care. Compounding the issue is the conflict of accepting an associate's degree as the entry-level credential for licensure and the limitations that degree imposes on the educator's ability to build critical thinking skills in the student. The current state of dental hygiene education illustrates this predicament in the plethora of dental hygiene programs only offering an associate's degree, including the influx of proprietary programs in large urban markets. The time required to develop such critical thinking skills and problem solving abilities can hardly be developed in the 90 credit hours of an associate's or certificate degree plan. The American Dental Hygienists' Association recognizes that the time has come to move beyond a two-year educational program if dental hygienists are ever going to actively engage the public's oral health needs in a changing healthcare system.[42]

Addressing the crisis of oral health care requires dental hygienists to move outside of the private practice box into alternative settings. Preventive care is primary care; therefore, dental hygienists need to be positioning themselves in a primary care setting, functioning in a public health paradigm to address individual and population risk factors. The dental hygiene professional needed today is one who assumes responsibility for actions, and is equipped with strong critical thinking abilities grounded in a strong research base. Darby and Walsh's Occupational versus Professional model describes the dichotomous components of a dental hygienist that do and do not meet these expectations. By using this model as a lens for viewing dental hygiene curriculum, perhaps a greater understanding will arise for how dental hygiene education can re-adopt a public

health perspective in order to advance the profession forward as the true

professionals dental hygienists are meant to be.

CHAPTER III

METHODS AND MATERIALS

This study was designed as a descriptive census study to document and analyze what educational components of a dental hygiene program influence a dental hygienist's orientation towards the Occupational Model or the Professional Model. Darby and Walsh's Occupational versus Professional Model was designed to encourage the development of a knowledge-based dental hygiene professional who is oriented towards a comprehensive paradigm of care within an inter-professional team of providers.[1] That expectation that dental hygienists work to improve the public's total health through a variety of venues, utilizing oral health interventions, has long been championed by the American Dental Hygienists' Association, governmental leaders, public health experts, and educators.[4,15,16,18,19, 31-34,42] The skills required to function in a comprehensive, professional capacity require additional critical thinking and problem solving abilities than can adequately be addressed in a two-year educational program, as is currently allowed for licensure.[32-34,42] In order to advance the profession and meet a growing public health crisis of an inadequate oral health care system, an evaluation of current educational practices must be undertaken.[32-34,42] An original survey was created to assess attitudes and actions of dental hygiene program directors, full-time faculty, and adjunct instructors who were the lead instructors of dental hygiene courses. For this study, the sample equaled the population: all entry-level dental hygiene programs were included in the survey population. Statistical analysis was performed on the resulting data to test for significance.

Research Question

Based on a pre-defined list of occupational and professional characteristics within dental hygiene education, what is the prevalence of educational methodologies oriented towards the Occupational Model versus the Professional Model?

Hypothesis

There is a difference in the type and number of educational methodologies utilized by faculty members who work in programs awarding associate degrees versus baccalaureate degrees.

Null Hypothesis

There is no difference in the type and number of educational methodologies utilized by faculty members who work in programs awarding associate degrees versus baccalaureate degrees upon graduation.

Sample Defined

As of early 2013, the American Dental Hygienists' Association listed 334 entry-level dental hygiene programs, including associate or certificate level programs and baccalaureate degree programs.[3] Because the research question centers on the prevalence of educational methodologies, all entry-level dental hygiene programs were studied. The study was considered a census study because the sample equaled the population. A snowballing sampling technique was utilized to contact the program director, who was then requested to forward the survey to lead course instructors within the program.

Power analysis estimated the population of dental hygiene educators to be approximately 1,500 individuals, and determined the minimum representative response rate to be 200 responses. 95% confidence level was estimated at 306 responses, with a 90% confidence level set at 230 responses. Actual response rate was 10.5% (n =157 participants), lower than the minimum participation of 200 responses needed to infer the results to the population of dental hygiene educators at large.

Design

For measuring prevalence, a descriptive, non-experimental design is appropriate.[44] A descriptive survey was a convenient means for collecting and measuring data regarding current health conditions, knowledge, or values of a population.[44] The general disadvantage of using a survey included limitations to the amount of quantitative and qualitative data that could be obtained from the participants.[44-46] However, for the purposes of this study, a survey was an appropriate design to measure foundational prevalence of dental hygiene educational methodologies. The study was designed with three primary goals: first, this study focused on the understanding the personal attributes and demographics of current dental hygiene educators; secondly, the survey was constructed to measure the influence of the institutional setting (programs awarding associate degrees versus bachelor degrees) on the educator's tendency towards a particular side of Darby and Walsh's model; thirdly, researchers sought to evaluate what educational methodologies are currently

utilized to develop critical thinking skills and problem solving abilities, which would then orient a graduate towards one side of Darby and Walsh's model.

Extraneous Variables

Timing was crucial, especially when conducting this survey research. One of the most crucial extraneous variables to control with this study was the timing of the survey launch. While advance preparation and development of a proposed timetable was crucial in survey instrument construction, a lack of familiarity with the complexity of the university Institutional Review Board process significantly delayed approval of the study and subsequent survey launch. The survey launched 8 weeks later than anticipated, reaching participants at one of the busiest points in the academic fall semester. Efforts were made to reduce the ripple effect of poor survey timing with careful selection of the day of the week and time of day survey invitations were emailed; a follow-up email and word of mouth communication reminding invited educators to participate were also generated. The resulting response rate was lower than necessary though, to infer results to the population. However, important details emerged from the sample, which will lend themselves well to subsequent studies.

A second variable to be controlled was the overall response rate for survey participation. Survey response rate is highly crucial in determining overall representative results: the higher the response rate, the greater chances the results can be inferred to the population at large.[45] An estimated 1,500 educators were invited to participate; actual participation rate was 157 faculty members, a resulting response rate of 10 percent. Multiple strategies for increasing survey

responsiveness were utilized, the first of which was an ample time frame of two weeks for survey participation, with a reminder email after one week. The second component for increasing survey response rate involved the survey design. The user-friendly survey design utilized with an electronic survey format, which allowed the respondent the ease of convenience in choosing the time, place, and device with which to participate; additionally, clear instructions for participation, short survey pages, colorful schematics, and a tracking bar showing the participant's progress enhanced the survey experience. Finally, a monetary incentive for completion was attached to the survey invitation as a means for increasing response rate. Participants were informed in the introductory email that, upon completion of the survey, they could voluntarily enter a drawing for one of three iTunes gift cards. Following the allocated time period for the survey, three winners were randomly selected to each receive ten dollar iTunes gift cards.

Human Subjects

This research study underwent evaluation and review by the Human Research Protection Office at the University of New Mexico; the Institutional Review Board of the University of New Mexico approved this survey as an exempt study (see Appendices D and E). All precautions were taken to ensure the rights, protection, and anonymity of participants throughout their involvement in the study. Survey questions were strictly anonymous. The electronic survey was designed in such as way to hide the IP addresses of the participant's computer or mobile device from the primary investigator, adding an additional

layer of privacy. Security features of PsychData surveys included an inability for participants or any observer to hit the "back" button on their web browser to return to survey questions. Survey responses were remotely secured in the host server facility in the form of encrypted data; therefore, no information could be retrieved from the participant's computer or mobile device via "cookies" or caches of data.

At the completion of the survey, participants were given the option to voluntarily enter a drawing for one of three iTunes gift cards. The participants selected a link, which directed them to a separate web page where they could voluntarily enter their contact information including name, daytime phone number, and email address. The drawing information was available to the primary investigator only and was stored on a secured computer during the time period for contacting the winners. Participant information was deleted once the gift cards were disbursed.

Procedures

Following IRB approval, and after obtaining contact information for dental hygiene program directors from the American Dental Hygienists' Association, an email was dispatched inviting directors, full-time faculty members, and lead course instructors to participate in an online survey regarding curriculum and educational methodologies (see Appendix F). Program directors were initially contacted and asked to forward the email on to their lead course instructors. Contained within the email was an explanation of the study, participant informed consent as required by the University of New Mexico's Institutional Review

Board, and a hyperlink to the web-based survey tool (Appendix G) was included.

Participation was encouraged through the use of a monetary incentive for

completion of the survey (Appendix H) The advantages of a 100% electronic

survey for participants included the convenience of responding from a place of

their choosing; the ability to answer only the questions that were pertinent to

them through skip logic software features of the online instrument

(PsychData.com design features); randomized questions to prevent colleague

bias; simplicity, speed and ease of use with electronic data submission; the

ability to answer sensitive questions at one's own pace; and finally preservation

of anonymity. Disadvantages of an electronic survey were considered to be the

necessity of having reliable Internet access to participate; the ease of being able

to abandon or quit the survey at any point; and the financial component of

including a drawing for a monetary incentive (iTunes gift card) to encourage

participation.

Timeline

Following creation of the survey, the questionnaire was pilot tested on 2

different dental hygiene programs for evaluation of format, effectiveness, and

clarity. Dental hygiene educators who were part of the pilot test were provided 1

week to complete the survey and provide feedback on the study. Due to minimal

response on the pilot test, no preliminary statistics could be run. The University of

New Mexico's Institutional Review Board approved the survey research on

November 5, 2013 following a lengthy process of review (Appendix E). The

survey was released to the target population on November 7, 2013 and

participants were provided a two-week window for completion. A reminder email was dispatched after one-week reminder email to encourage cooperation. Following completion of the survey, the data was processed and analyzed for statistical significance.

Survey Instrument

The survey instrument (Appendix G) was a 29-question electronic survey designed to measure the prevalence of educational methodologies utilized within dental hygiene education. Electronic or web-based surveys as research instruments have increased in popularity as society utilizes and integrates technology in innovative ways.[45,46] The use of an electronic survey presents the researcher with multiple benefits, including reduced costs and increased ease of data collection and analysis.[46] However, some investigators have noted that electronic surveys may produce lower participation rates due to participant lack of familiarity with web-based technology, questionable reliability of internet service, lack of trust in sending sensitive or confidential information over the internet, as well as what one researcher calls "survey saturation," or the state of constantly being bombarded with questionnaires and surveys to answer.[46] Such a desensitization to survey research invitations may disincline the potential participant to consider the offer for participation in research.[46] Survey researchers must employ thoughtful strategies to overcome potential barriers in response rates through personalization techniques in the invitation, use of succinct questions within the body of the text, and reminder emails during the survey window.[46] Within this study, the survey invitation email could have been

enhanced by adding an element of personalization. Survey questions were of moderate strength in succinctness and clarity. While one reminder email was sent after the first week of participation, additional follow-up one or two days prior to completion may have been helpful in increasing overall responsiveness.

The first 11 questions on this survey focused on educator demographics, level of personal engagement in non-teaching related activities, type and frequency of resources utilized as an educator, and program demographics. Questions 12-17 addressed components of clinical courses that reflect the development of critical thinking skills via self-reflection strategies and emphasis on process of care versus technical ability. Questions 18-21 followed a vignette of a clinical scenario and invited feedback on the culture of the clinical learning environment. These questions were designed to assess if clinical faculty emphasize a culture of perfection over formative feedback, and the manner in which student errors are addressed. Questions 22-27 inquired about strategies utilized in didactic courses to develop critical thinking skills, and their perceived effectiveness. Question 28 addressed the challenge of incorporating research activities within a didactic course and asked for educator opinions on the perceived difficulty of developing research skills. Finally, Question 29 provided the participants an opportunity to summarize or add additional thoughts related to educational methodologies or Darby and Walsh's Occupational versus Professional Model as applied to dental hygiene education.

The survey was developed from an original theorem created by the researcher, detailing practical applications of Darby and Walsh's Occupation

versus Professional Model (Appendix A) to dental hygiene education (see Appendices B and C). Based on a study of current educational methodologies found in dental and allied health educational literature, strategies applied to the Professional component of the model were chosen for their demonstrated effectiveness in developing critical thinking skills and problem solving abilities. The inverse of those assessment and evaluation tools was derived and applied to the Occupational side of the model. The theorem was then critiqued and confirmed by three thought leaders within the profession of dental hygiene, leaders who all have an established track record of excellence in innovation, teaching, and development of critical thinking skills. The reliability of the baseline theorem, from which the survey instrument was constructed, has yet to be established through longitudinal, replication studies.

Statistical Analysis

Survey questions utilized nominal and ordinal data due to the descriptive nature of the research. Questions pertaining to didactic and clinical evaluation strategies were categorized as "occupational" or "professional", and thus were classified as nominal data. The resulting statistical analysis included frequency counts for demographic data, as well as Pearson's chi-square and Cramer *V* analyses for the categorical data (see Appendix I Statistical Tables). The level for statistical significance was established as $\propto$ = 0.05. Relationships were analyzed between educators from programs offering an associate's degree and their choice of occupational or professional strategies and compared against similar choices made by educators from baccalaureate degree- granting programs.

Because the purpose of this research was to gain insight into dental hygiene curriculum and the population of dental hygiene course instructors, the resulting data analyses were relatively weak. The results were insufficient to generalize to the population of dental hygiene educators at large, and conclusions may only be drawn for the sample of interest. Still, statistical significance was noted in several areas, warranting continued study in the years to come.

Budget

Study expenses included the monetary incentive attached to the survey and costs for data analysis. The participants who completed the survey were eligible to enter a randomized drawing for one of three iTunes gift cards. Two weeks following the survey completion date, winners were randomly selected and gift cards were distributed accordingly. Additional expenses incurred related to the consulting fees for statistical analysis of the data.

CHAPTER IV

RESULTS

Introduction

The current study examined faculty reports of their use of different

educational methodologies in conducting courses in the field of dental hygiene.

Specifically, the study assessed the prevalence of "occupational" and

"professional" educational approaches among faculty. Furthermore, the study

assessed the extent to which the prevalence of occupational and professional

methodologies differs based on whether faculty members teach in programs that

confer Associate's Degrees or Bachelor's Degrees upon program completion. In

order to assess the prevalence of these two educational approaches, a variety of

teaching strategies were coded as either professional or occupational in nature.

Sample Description

The frequencies and percentages of categorical demographic variables

are displayed in Table 1. The vast majority of participants held Master's Degrees

(75.2%), and relatively few participants held Bachelor's Degrees (11.5%) or

Doctorate Degrees (12.7%). Half as many participants had degree

concentrations in dental hygiene (33.1%) compared to participants who had

degree concentrations other than dental hygiene (66.9%). Slightly more than

one third of participants had more than 20 years of experience in dental hygiene

education (35.0%), and just over half of participants worked in a community

college (56.7%). Almost all participants were in full-time faculty positions for the

2013–2014 academic year (94.9%), and slightly more than half of respondents

anticipated finishing their educational career within the next ten years (57%).

Most participants worked for programs that awarded Associate's Degrees

(81.8%) upon completion of program requirements, and a small percentage

worked for programs that awarded Bachelor's Degrees upon completion of

program requirements (18.2%).

[Table 1]

      Pearson's chi square and Cramer's *V* tests were used in crosstab

analyses to examine the relationship between degree awarded upon completion

of the program and the six demographic variables. As shown in Table 2, the

relationship between institutional setting and degree awarded was statistically

significant. A greater proportion of participants who worked for programs that

awarded Bachelor's Degrees worked for universities compared to participants

who worked for programs that awarded Associate's Degrees (p <0.001).

Congruently, a greater proportion of participants who worked for programs that

awarded Associate's Degrees worked in a career college or technical institute

compared to participants who worked for programs that awarded Bachelor's

Degrees (p <0.001). No other statistically significant relationships were revealed

between particular degree awarded and the remaining five demographic

variables.

[Table 2]

      The frequencies and percentages of methodologies chosen for personal

engagements are displayed in Table 3. For engagement in community service,

engagement in institutional service, presenting CE courses or workshops, and

professional service, the vast majority of participants indicated professional

methodology as indicated by slight, moderate, or high levels of engagement.

The percentages of participants who participated in faculty practice/private

clinical practice were almost the same: 51% had no involvement in faculty

practice/ private clinical practice, as opposed to 49% who indicated varying

degrees of involvement in clinical practice. It would seem that the 49% who

indicated varying degrees of clinical practice involvement would represent a more

professional perspective. Finally, more participants indicated the occupational

position of no involvement versus the professional position of degrees of

personal engagement in original research and scholarly publications.

[Table 3]

Table 4 shows the frequencies and percentages of chosen methodologies

for educator resource use. As shown in the table, more than four fifths of all

participants supported professional methodologies (utilized somewhat, utilized

moderately, or highly utilized) for the following: use of ADEA, ADHA, or CEs; use

of peer-reviewed journals; use of peer-reviewed resources; and participation in

clinical education methodology course. For use of product representatives,

almost twice the amount of participants supported professional methodology (did

not utilize, utilized very little, utilized somewhat) as the amount of participants

who supported occupational methodology (utilized moderately, highly utilized).

For use of popular resources like *RDH* or *Hygienetown*, occupational

methodologies (utilized somewhat, utilized moderately, highly utilized) were

supported by participants slightly more than were professional methodologies.

Lastly, the vast majority of participants supported occupational methodology for use of dental CEs (utilized moderately, highly utilized).

[Table 4]

The frequencies and percentages of chosen methodologies for calculus removal importance are displayed in Table 5. For importance of calculus removal, approximately 90 percent of participants indicated occupational methodology (moderately or highly important). Interestingly though, for importance of calculus removal in determining a clinician's competency, about nine out of ten participants indicated professional methodology (calculus removal is a component of competency but not the defining quality).

[Table 5]

The frequencies and percentages of supported methodologies for self-reflection in clinical courses are displayed in Table 6. For self-reflection through student journal, blog, or Wiki entry in clinical courses, the amount of participants who supported nonprofessional methodology and the amount of participants who supported professional methodology were almost the same (none to little usage versus usage to high usage). For self-reflection through student portfolio in clinical courses and self-reflection through student verbal feedback in clinical courses, the majority of participants did not use such strategies, thus endorsing a nonprofessional methodology. For self-reflection through students' completing forms or checklists in clinical courses, about half of participants seem to indicate non-occupational methodology (did not use forms/ checklists for self-reflection), and the other half of participants supported occupational methodology (used

forms/ checklists for reflection). Finally, almost all participants had a formal

system for student self-reflection within clinical courses, reflecting compliance

with CODA mandates for dental hygiene program accreditation.

[Table 6]

 Table 7 shows the frequencies and percentages of supported

methodologies for clinical grading procedures. A vast majority of participants

seemed to support professional methodology through use of the following

methodologies: grading cumulatively for key clinical experiences in clinical

environments, grading with formative feedback in clinical environments, and

grading with pass/fail assessments in clinical environments. Contrarily, a vast

majority of participants indicated occupational methodology for the following:

grading tasks and procedures daily in clinical environments, and grading with

checklists with point values in clinical environments.

[Table 7]

 Table 8 shows the frequencies and percentages of supported

methodologies for student feedback and errors. For formative feedback with no

penalty on senior exam, about three quarters of participants indicated

nonprofessional methodology. For fundamental errors on the senior exam,

slightly more participants stated that the student's fundamental error was a failure

to assess, plan, or implement care, supporting a more professional perspective;

less participants indicated an occupational perspective identifying the student's

fundamental error as a failure to seek assistance in a difficult situation. For use

of course discussion of errors on senior exams, a majority of participants seemed

to indicate an occupational methodology of discussing the errors generically as a warning to others students of where their skill level should be. Additionally, almost all participants utilized a professional methodology of verbal questioning as a tool for identifying the errors committed with a large percentage of participants requiring the student to self-reflect about the errors in writing. For use of team discussion as feedback on senior exam, participants were more likely to use an occupational perspective of not discussing errors within a huddle-like setting than did participants who utilized such an experience as a learning moment for the team of students.

Also shown in Table 8, the majority of participants did not identify the need for remediation on senior exams, nor did they recommend penalizing daily/patient grade for errors on the senior exam (non-occupational methodology), although there was only a slight difference from those who would endorse a point deduction for errors committed (occupational). For providing feedback on instrumentation techniques on senior exams, more than three quarters of participants supported professional methodology of sitting with the student to identify and work through the fundamental errors; less than one quarter of participants supported nonprofessional methodology. Finally, for most weighted senior evaluation strategy in the final clinical course, a vast majority of participants seemed to indicate a professional paradigm of a completing capstone patient experience, a specific competency, or completion of all clinic/patient requirements and relatively few participants indicated an occupational perspective of using a mock clinical exam as the highest weighted strategy.

[Table 8]

The frequencies and percentages of methodologies for didactic evaluation strategies pertaining to exams, projects, and presentations are displayed in Table 9. A vast majority of participants indicated a professional perspective through varying degrees of use (used infrequently, somewhat, moderately, or high) and few participants supported an occupational perspective (did not use) for the following: use of case study/testlet in didactic courses, use of essay test in didactic courses, and use of independent research project in didactic courses. Contrarily, a vast majority of participants indicated an occupational perspective (did not use), and few of participants seemed to support a professional perspective (varying degrees of use) for the following: use of mock exam in didactic courses, use of multiple choice test in didactic courses, and use of oral presentation in didactic courses. For use of oral exams in didactic courses, the amount of participants who implied an occupational paradigm was almost the same as the amount of participants who inferred a professional paradigm. Finally, more participants seemed to indicate a professional perspective (varying degrees of usage) than they did occupational perspective (did not use) for use of OSCE in didactic courses.

[Table 9]

The frequencies and percentages of methodologies for didactic evaluation strategies pertaining to preparatory exercises are displayed in Table 10. A vast majority of participants supported professional methodology through varying degrees of use, and few participants supported occupational methodology of not

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using for the following: use of competencies in didactic courses, use of reflections in didactic courses, use of rubrics in didactic courses, and use of self-evaluations in didactic courses. More participants supported professional methodology than did participants who supported occupational methodology for the following: use of logic models in didactic courses, use of portfolios in didactic courses, and use of standardized patients in didactic courses. Finally, for use of observation checklists in didactic courses, about twice the amount of participants supported occupational methodology (used somewhat, moderately, or highly used) participants as the amount of participants who supported professional methodology (did not use or used infrequently).

[Table 10]

The frequencies and percentages of methodologies for critical thinking development in didactic courses are displayed in Table 11. Most participants supported professional methodologies (utilized the following exercises) for the development of critical thinking skills through reviewing and analyzing cases, self-reflection and assessment, individual or team learning activities/assignments, research assignments, treatment planning exercises, and writing assignments. Conversely, a greater percentage of participants supported nonprofessional methodologies (did not use) for the development of critical thinking skills through student development of cases. Participants were evenly split between endorsing occupational methodologies (utilizing) and non-occupational (not utilizing) methodologies for the development of critical thinking skills through quizzes on reading assignments in didactic courses.

[Table 11]

The frequencies and percentages of methodologies for self-reflection in didactic courses are displayed in Table 12. A majority of participants supported professional methodologies for self-reflection through the use of student verbal feedback and journal, blog/Wiki, or discussion board. Most participants supported occupational methodologies for self-reflection through the use of student forms or checklists.

[Table 12]

The frequencies and percentages of methodologies for didactic course teaching strategies are displayed in Table 13. A greater percentage of participants supported professional teaching methodologies for use of case studies, clinical application exercises, dialogues, group learning activities, research assignments, Socratic questioning, and writing assignments. However, a greater percentage of participants supported occupational teaching methodologies for use of PowerPoint presentations. Lastly, a slim majority of participants believed that occupational methodologies (multiple choice exams), carried more weight than did professional methodologies (completion of course objectives, research assignments, writing assignments, group learning activities) for evaluation strategies in didactic courses.

[Table 13]

Participants were asked what they believe is the most common reason research activities are not utilized or required in didactic courses. Approximately one fifth of participants chose not to respond (19.7%); however, most participants

felt that curriculum constraints were the reason that research activities were excluded from didactic courses (40.1%). A very small number of participants believed that research activities were excluded from didactic courses because the development of research skills is the responsibility of a specific faculty member (3.2%). Less than one fifth of participants cited either class time constraints (15.9%) or the instructor's lack of familiarity with research (13.4%) as the most common reason that research activities are not utilized or required in didactic courses.

Crosstab analyses using Pearson's chi square and Cramer's V tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for personal engagement activities. As shown in Table 14, the relationship between personal engagement in original research and degree awarded upon completion of program was significant ($p < 0.042$). A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies for personal engagement in original research compared to participants who worked for programs that grant Associate's Degrees. The relationship between personal engagement in scholarly publications and degree awarded was also significant ($p < 0.002$). A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies for personal engagement in scholarly publications compared to participants who worked for programs that grant Associate's Degrees. Degree awarded was not significantly related to any other personal engagement activities.

[Table 14]

      Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for educator resources. As shown in Table 15, the relationship between use of popular resources like *RDH* or *Hygienetown* and degree awarded upon completion of program was significant ($p < 0.001$). A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies of little to no use of popular resources compared to participants who worked for programs that grant Associate's Degrees.

      Also shown in Table 15, the relationship between use of product representatives as an educator and degree awarded upon completion of program was significant ($p < 0.042$). A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies for little to no use of product representatives as an educator compared to participants who worked for programs that grant Associate's Degrees. The relationship between participation in clinical education methodologies courses, workshops, or CE events and degree awarded upon completion of program was significant. A greater proportion of participants who worked for programs that grant Associate's Degrees supported professional methodologies for participation (utilized somewhat, moderately, or highly utilized) in clinical education methodology courses compared to participants who worked for programs that

grant Bachelor's Degrees (p < 0.049). Degree awarded was not significantly related to any other educator resources.

[Table 15]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for calculus removal importance. As shown in Table 16, degree awarded was not significantly related to calculus removal importance.

[Table 16]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for self-reflection in clinical courses. As shown in Table 17, degree awarded was not significantly related to incorporating self-reflection into clinical courses.

[Table 17]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for clinical grading procedures within clinical environments. As shown in Table 18, degree awarded was not significantly related to clinical grading procedures.

[Table 18]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of

program and supported methodologies for student type of feedback and errors. As shown in Table 19, the relationship between use of course discussion of errors on senior exams and degree awarded upon completion of program was significant. A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies for use of course discussion of errors on senior exams compared to participants who worked for programs that grant Associate's Degrees ($p < 0.040$). The relationship between use of point deduction from daily grades for senior exams and degree awarded was significant. A greater proportion of participants who worked for programs that grant Associate's Degrees supported occupational methodologies for use of point deduction from daily grades for senior exams compared to participants who worked for programs that grant Bachelor's Degrees ($p < 0.040$). Degree awarded was not significantly related to any other type of student feedback and errors.

[Table 19]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for didactic evaluation strategies pertaining to exams, projects, and presentations. As shown in Table 20, degree awarded was not significantly related to didactic evaluation strategies pertaining to exams, projects, and presentations.

[Table 20]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for didactic evaluation strategies pertaining to preparatory exercises. As shown in Table 21, the relationship between use of reflections in didactic courses and degree awarded upon completion of program was significant. A greater proportion of participants who worked for programs that grant Bachelor's Degrees supported professional methodologies for use of reflections in didactic courses compared to participants who worked for programs that grant Associate's Degrees ($p < 0.030$). Degree awarded was not significantly related to any other didactic evaluation strategy pertaining to preparatory exercises.

[Table 21]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for types of critical thinking development in didactic courses. As shown in Table 22, degree awarded was not significantly related to any type of critical thinking development in didactic courses.

[Table 22]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for self-reflection in didactic courses. As shown in Table 23, degree awarded was not significantly related to any type of self-reflection in didactic courses.

[Table 23]

Crosstab analyses using Pearson's chi square and Cramer's *V* tests were conducted to examine relationships between degree awarded upon completion of program and supported methodologies for didactic course teaching strategies. As shown in Table 24, degree awarded was not significantly related to any type of didactic course teaching strategies.

[Table 24]

CHAPTER V

DISCUSSION

This study suggests that concerns with the quality of dental hygiene education, as it currently stands, may be valid. This survey sought to discover the prevalence of "occupational" and "professional" educational methodologies utilized by dental hygiene educators, as well as possible differences that might exist between an associate degree program and a baccalaureate degree program. Frequencies and percentages were calculated for all educational methodologies. Overall, there was much variation in the endorsement of different occupational and professional methodologies. In general, professional methodologies appeared to be more popular among faculty than occupational methodologies. While the sample response rate was insufficient to infer to the population of dental hygiene educators at large, there was enough significance to reject the null hypothesis of the study that there was no difference between methodologies employed by dental hygiene faculty from programs awarding an associate's degree versus a bachelor's degree.

Faculty Characteristics

A key component of this study was to profile demographics of current dental hygiene educators in order to ascertain if there was a relationship with prevalence of various methodologies. Within the sample, common characteristics that emerged reflected an educator who is well experienced in the field of dental hygiene. Seventy-five percent of respondents held a master's degree or higher, of which one third reported their degree concentration was in dental hygiene.

Thirty-five percent of the sample had more than 21 years of teaching experience, and over one half of all participants (57 percent) anticipated finishing their educational career within the next 6-10 years. The majority of respondents were associated with a program awarding an associate's degree (81 percent), including a statistically significant number of respondents from proprietary schools. These findings confirm data first revealed by Nunn *et al*. (2004) ten years ago that cited an impending allied dental health faculty shortage due to the educator's age.[47] Little has changed in the last decade regarding the need for qualified dental hygiene educators. An interesting trend emerged from these demographics related to the small percentage of dental hygiene educators who could be labeled true "experts" in dental hygiene as a result of possessing a terminal degree in dental hygiene. There is no question that prominent leaders within dental hygiene have developed from complementary degrees in higher education or related health disciplines, serving the profession well; many of these leaders pursued their advanced education at a time when the terminal degree in dental hygiene was equal to the entry-level degree of an associate's or bachelor's degree, or a master's degree in dental hygiene was not readily accessible to them.

As of March 2014 though, twenty-two programs existed to provide the terminal degree for the discipline, a Master of Science in Dental Hygiene (MSDH) and efforts have progressed with the development of the first Ph.D. in Dental Hygiene program.[48] The majority of MSDH programs today are online or a hybrid of online and face-to-face instruction, leaving qualified candidates with ample

opportunity to pursue expertise in the field. In order to move the discipline

forward in terms of being recognized as a profession, recruitment of new faculty

members who are experts in the discipline of dental hygiene, as evidenced by

rigorous scholarship and possession of the terminal degree, will play a crucial

role.

The second notable finding of this study related to the value placed by

the faculty on non-teaching related activities. Results indicated that participants

were more likely to take a professional approach to, or proactive development of,

the following non-teaching related activities: they showed higher levels of

personal engagement in community service, institutional service, service to the

profession, and scholarly activities such as presenting continuing education (CE)

courses or workshops. Additionally, the frequency of use for educator-focused

continuing education courses (such as those offered by ADEA, ADHA, or various

universities), clinical education methodology workshops or CE events, peer-

reviewed journals like *Journal of Dental Hygiene* or *Journal of Dental Education*,

and peer-reviewed resources like *Dimensions of Dental Hygiene* or *Access* was

utilized moderately or highly by the participants. This could be due to the fact that

most of the participants (more than three fourths of the sample) possessed a

master's degree or higher. The exposure to research principles and the

experience of using rigorous scientific journals during the course of graduate

studies instills an appreciation for quality academic resources; ideally, it should

inform the importance of making solid, evidence-based recommendations within

clinical and didactic instruction. The need for evidence-based educational

practice is, and will continue to be, an influential component in defining faculty scholarship and development.[49,50, 51]

Conversely, additional findings revealed that while dental hygiene educators appreciate the value of reputable academic resources as demonstrated by varying degrees of utilization, a significant gap existed when it came to participating in original research or scholarship. Forty-three percent of respondents had engaged in original research within the last year, with a slightly higher percentage (53%) contributing to scholarly publications during the same academic year. If this sample were anywhere close to a realistic representation of dental hygiene educators at large, the number of faculty currently engaging in original research would be less than 3 percent of all dental hygiene educators - a concerning statistic indeed! Educators participating in scholarly activities were primarily from baccalaureate-granting institutions; this statistically significant finding confirmed common knowledge regarding the values held by universities versus community colleges or proprietary institutions towards members of the academy.[53,54] Excellence in teaching for university faculty members has historically been exemplified through scholarly contributions, while community college educators have taken the alternate approach to invest their commitment of time into serving their local community.[51,53,54] These variations in priorities reflect the missions of the institutions as a whole, and should not necessarily be generalized to all faculty members within those respective environments.[51,53,54] However, the concern with this polarization relates to the crucial importance of scholarly values when considering the development of professional roles within

society. Even leaders within the American Association of Community Colleges have started to identify gaps between the skills imparted in a two-year degree and professional abilities required within the workforce today.[51] Educators cannot instill within their students a value they themselves do not model or possess; a lack of research values translates into ineffective, evidence-based practice resulting from deficient, fundamental skills in understanding and applying scientific knowledge.[22]

As a result of differences in the values of four-year universities versus two-year institutions, colleagues in associate degree programs face heavy limitations in the number and type of courses they can offer in their curriculum. This "curriculum crunch" appeared to have an effect on the professional development of the faculty member, according to survey responses. From this small study, educators were more likely to take an occupational approach to the following methodologies: limited to no engagement in faculty practice/ private clinical practice; limited to no involvement in original research, and higher utilization of dental CE courses and popular resources like *RDH* or *Hygienetown* for educational materials.

The majority of participants explained this discrepancy between research appreciation and personal application by citing the obstacle of curriculum constraints when trying to include research activities within their courses (50%); the perception of many, particularly in two-year programs, centered on the vast number of other topics requiring attention in a didactic course; due to the overwhelming volume of material, participants felt inhibited from including

research activities as a key course component. Approximately 20 percent of participants believed that class time limitations were the biggest challenge, and 16 percent were personally uncomfortable or unfamiliar with research principles, and thus avoided incorporating the development or application of research skills altogether. A growing consortium of dental education experts are challenging the notion that reliance on vast personal clinical or educational experience alone is sufficient for imparting the necessary knowledge and skills for clinical practice.[49,50,52] Dental hygiene leaders are recognizing that oral health care is so much more than technical ability- students must be able to use higher level thinking as a means for problem solving, and addressing complex situations from a evidence-based perspective, necessitating an impartation of strong research knowledge base from the start.[30,33,34,42,43,49,50,52]

Clinical Instruction

The majority of respondents in this survey held teaching responsibilities within a clinical course during the 2012-2013 academic year (84% of participants). This was noteworthy because three-fourths of participants viewed calculus removal to be a moderately to highly important part of the patient care experience, providing further detail that errors in clinical care would result in point deductions for the student. It is a natural assumption that students would apply the most effort to course components weighted the heaviest when considering a course's final grade; logically, if the summative emphasis is placed on technical ability, a student will subsequently focus on mechanical abilities and the resulting outcomes of instrumentation. Thorough debridement is important but needs to be

rightfully placed within the context of contributing to overall health. If basic risk assessment and management is overlooked within the process of care, quality instrumentation does little to solve the underlying root issues of low oral health values.

Didactic Methodologies

Another finding from this study pointed to the type of classroom strategies utilized by many dental hygiene faculty members as being significant. Educators surveyed from two-year programs heavily utilized traditional pedagogical strategies like multiple-choice examinations, power-point lectures, observation checklists, and checklist-like forms for student self-reflections within the classroom. It is acknowledged that heavy teaching loads necessitate efficient strategies for teaching and time management; this goes along with the "curriculum crunch" imposed by the system of two-year degree programs and the need to cover a broad array of subjects in a short amount of time. Strategies for learning should be considered though, for their overall effectiveness versus for their convenience of use.[53] Traditional pedagogical assessments do little to develop critical thinking skills in the student. Instead, the student is positioned in a passive learning role, responsible for content retention instead of critical thinking application.[53,54]

An andragogical approach, by nature, develops stronger critical thinking abilities because it shifts the emphasis on learning from the teacher to the student, and from the content to the process.[53, 54] These principles are translated into strategies for active learning (group learning) and experiential learning

because it necessitates ownership of one's actions in the process of learning.[54] Interestingly, higher numbers of educators from both associate and baccalaureate degree programs were more likely to consider the following strategies as effective in developing critical thinking skills, whether or not they utilized them: use of formative feedback, team learning activities/ assignments, research assignments, reviewing and analyzing cases, self-reflection and assessment, treatment planning exercises, and writing assignments. This confirms what many educational studies have stated to be effective ways for developing critical thinking skills.[6-13,55-57] When it came to applying such strategies in person, the trend showed positive efforts to incorporate many of these learning techniques into the classroom. Significance was noted in the prevalence of educational strategies within didactic courses such as the use of case studies, writing assignments, group learning activities, questioning and dialogue interactions, incorporation of research-based assignments, and self-reflection exercises using verbal feedback, journals, blogs, or discussion board entries. The aforementioned methodologies were utilized in varying degrees but still represent significance because of the value in developing critical thinking and problem solving skills. Even minimal incorporation of such activities pushes students to move past content retention into an active learning mode. [6-13,55-57]

Development of an active student learner requires intentional development of the educational abilities and professional growth as a faculty member.[12,53] Traditional pedagogy has historically demanded minimal educational methodology in order to deliver the necessary content to a homogenous group of

students.[54,57] Lecture-style presentations have done little to engage students in higher ordered thinking skills necessary for employment as a healthcare provider, much less a professional practitioner. [54,56] Because today's classroom represents a completely diversified student body, including higher numbers of non-traditional students, faculty must move beyond heavy reliance on convenient, pedagogical strategies like power point presentations and challenge themselves and their students through active and experiential learning strategies in order to achieve desired professional outcomes. [54,58]

Limitations

Limitations of this study related to the technical aspects of conducting survey research. Inadequate response rate of 10.5% (n= 157 participants) inhibited any significant findings from being inferred to the population of dental hygiene educators at large. Despite their ease of use and convenience for reaching a mass audience, survey research literature has identified that electronic or web-based surveys generally receive a lower response rate than paper surveys (33% and 56% comparatively). [47,59] Time saved in utilizing a web-based survey must be offset with additional measures to increase response rates; such actions could include additional personalization features; advanced email notifications of the upcoming survey; shorter email introductions; longer time frame for participation; and additional reminder emails dispatched.[47,59] Multiple recommendations were employed with this survey that potentially increased the participant response rate. Successful components included use of an incentive; brief, colorful survey pages; simple instructions for participation; and

a reminder email for participation. Contact information for lead course instructors was not readily available from the list of program contact sources; thus, reliance on program administrators through the snowball sampling technique was necessary for involving other faculty members.

Future Research

Considering the overall response rate from this study, the prevalence of educational methodologies oriented towards an occupational or professional paradigm may be under-estimated. This highlights the need to refine and repeat this research design in such a way as to better assess the methodologies of dental hygiene educators' nation-wide. In response to the open-ended question at the end of the survey, participants expressed enthusiasm about the topic and were eager to hear strategies for moving the dental hygiene education forward. Additionally, while faculty members do well to stay abreast of current educational methodologies, many find difficulty in applying those strategies to their individual courses and teaching responsibilities. Educational practices need to be evidenced-based; however, if many educators within two-year programs liken research activities to rocket science with regards to complexity, forward progress will be difficult to attain. Devising ways to apply research principles and active learning strategies across the curriculum could strengthen the overall progression of critical thinking skills development within dental hygiene educational programs. Finally, advocating for the development of the professional dental hygienist requires establishing the reliability of the theorem applying Darby and Walsh's model to dental hygiene education. Consensus is

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needed on what constitutes best practices for the educational development of today's dental hygiene professional.

Summary

Dental hygiene education is making small steps forward in the quality of patient care delivered by oral health care providers. Yet, the system of dental hygiene education itself is in need of transformation, just as the climate of health care finds itself rapidly evolving. Dental hygiene education must embrace an andragogical, research driven perspective if dental hygienists are ever to take a more prominent role within health care as primary care providers. Although these research results were small in number, they were significant in reminding oral health educators what other allied health professions have long known: an associate's degree is not enough. Professional skills require development through the process of obtaining a professional degree- a bachelor's degree or higher.

APPENDIX A

DARBY AND WALSH'S ORIGINAL

OCCUPATIONAL VERSUS PROFESSIONAL MODEL

Darby, M.L. and Walsh, M.M. (1993) Table I: sample propositions from two conceptual models of dental hygiene. Taken from A proposed human needs conceptual model: part I. *J Dent Hyg, 67*(6). 326-334.

Table I
Sample propositions from two conceptual models of dental hygiene.

Occupational	Professional
Hygienist implements preventive treatment plans developed by dentist	Hygienist implements self-generated preventive treatment regimens
Secondary care providers: Hygienist carries out isolated duties as indicated by supervising dentist	Primary care providers: Hygienist uses process of care to assess needs, plan and implement care, and evaluate client
Hygienist is auxiliary of dentistry	Hygienist is professional who collaborates with dentistry and other health professionals
Hygienist is responsible for less complex, easier oral healthcare services	Hygienist is responsible for services which include some of the more difficult techniques to master in dentistry
Hygiene care involves oral prophylaxis every six months at a 30–45 minute appointment	Hygiene care involves multiple interventions which may require multiple appointments and appointment lengths
Hygienist is responsible for less valued services, leaving dentist time for important services	Hygienist is responsible for preventive and oral maintenance care which is most valued by today's wellness-oriented consumer
Unsupervised dental hygiene practice reduces the quality of oral healthcare and increases patient risks and care costs	Unsupervised dental hygiene practice increases public access to oral hygiene care and lowers healthcare costs
Dentistry is responsible for making decisions about dental hygienists	Dental hygiene is responsible for making decisions about dental hygienists
Dental hygienists are accountable to the dentist	Dental hygienists are accountable to the client (consumer)
Client is passive since dentist is responsible for the client's oral health	Client is active since client is responsible for his/her own oral health
Hygienist fulfills specialist role through function of a clinician	Hygienist fulfills specialist role through functions of clinician, educator/health promoter, manager, change agent, consumer advocate, and researcher
Dental hygiene is technically based	Dental hygiene is knowledge-based

From Darby ML, Walsh MM: *Dental Hygiene Theory and Practice*, Philadelphia, W.B. Saunders Co. (In press).

APPENDIX B

CRITICAL THINKING THEOREM
Application of Darby and Walsh's Occupational Versus Professional Model to
Dental Hygiene Education

Occupational Model			
	Classroom	**Clinic**	**Faculty Attitudes**
Philosophy of Learning	Pedagogical • Reliance on traditional lecture format • Instructor led • Responsible for designing and dictating learning experiences	Task- oriented • Quota based • Checklist mentality	Towards students: • Paternalistic
Strategies for Promoting Learning	Emphasis on: • Foundational knowledge • Devaluing of research skills and application • Little emphasis on problem-solving and critical thinking skills	Emphasis on: • Technical skills and abilities • Calculus removal • Achieving quota of quadrants/ types of patients • Dependent on the dentist/ instructor for direction	Towards colleagues: "Dental hygienists who teach" • Individualistic • Inflexible • "My way is right"
Course Components	Incorporation of: • Lower-level performance verbs for course objectives • Lectures, quizzes, memorization/ regurgitation	Emphasis on: • Summative feedback • "Teach to the test"- clinical courses structured towards passing clinical licensing exam • "Every man for himself"- individualistic mindset	Towards the program: • Individualistic • Personal agendas and biases • Resistant to change • Satisfied with the status quo
Grading	• Centers on quantitative evaluation- little to no qualitative component • Traditional quizzes, exams, and projects • Competitive	• Grading is punitive • Culture of perfection • Competitive • "I have Mrs. X today; okay, I know how to act."	
Role of the	• Passive participants	• Technicians	• "Do what I say"-

Student	in learning (hidden culture of learning) • Clinical care is the ultimate goal		subversive message to students
Role of the Faculty	• Lecturer	• Teacher, task master	• Clinicians who teach (no formal educational methodology background_

Professional Model			
	Classroom	**Clinic**	**Faculty Attitudes**
Philosophy of Learning	Andragogical Approach • Conference style learning • Learner directed • Use of questioning • Group interactions	Competency based • Critical thinking and application	Towards students: "Colleagues in training"
Strategies for Promoting Learning	Emphasis on: • Research skills and application • Evidence-based decision making • Problem-based learning • Case studies	Emphasis on: • Process of care • Critical thinking and problem solving • Student-directed patient experiences	Towards colleagues: "Dental hygiene educators working together" • Equality • Team mentality • Professionalism
Course Components	Emphasis on: • Incorporation of higher-ordered performance verbs for course objectives • Writing assignments • Teamwork/ group assignments • Opportunities for creativity	Emphasis on: • Use of student self-reflections • Formative feedback • Group learning environment • Fostering leadership and teamwork	Towards the program: • Supports the mission of the program • Respects the established hierarchy of authority • Willing to take risks and try new ideas
Grading	• Quantitative AND qualitative evaluation • Thinking outside of the box for evaluation strategies- not limited to traditional quizzes/ exams • Utilization of portfolios, journals	"It's ok to make mistakes" • Mistakes are viewed as learning opportunities. • Decreased emphasis on summative feedback	• Not "out to get" the student • Supports and encourages budding professionals
Role of the Student	• Active participants in learning.	Student clinicians are co-therapists	

	• Self-direct learning experiences • Clinical care is the starting point- encouraged to take an active role in their institution, community, and profession	and members of an inter-professional health care team	
Role of the Faculty	• Facilitator	• Teacher, coach, mentor, and role model	• Professional dental hygiene educators

APPENDIX C

CRITICAL THINKING THEOREM WITH EXAMPLES

EXAMPLES

	Occupational	**Professional**

Didactic Learning	• Traditional lecture
	• Relies on power points and textbooks
	• Lack of application (lecture>clinical care)
	• Passive learning
	• Teacher-centered learning
		• Socratic/ conference style learning
		   o Asking questions
		   o Solving problems
		   o Case-based seminars
		   o Problem-based learning
		   o Small group discussions
		• "Flipped classroom"
		• Alternative/ creative modes of learning (i.e. multi-media, guest speakers, hand-on learning activities)
		• Active learning
		• Self-directed learning
		• Service learning

Student Assignments	• Reading assignments and quizzes • Fact-focused power point presentations • Memorizing/ regurgitating for multiple choice tests	• *Searching, evaluating, and applying scientific literature • *Writing assignments • *Self-assessment • *Reflection • Developing case studies • Application of ethics • Treatment planning exercises • Researching, evaluating, and applying new technologies and products • Compare and contrast • Role playing
Clinical Learning	• Goal: passing clinical licensing exam • Teacher-dominated instruction • Focused on calculus removal • Task/ procedure oriented	• Goal: developing and demonstrating entry-level competency • Self-directed learning • Focused on ADPIE process of care • Emphasis on risk assessment • Service-based learning

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		•
Evaluation Strategies	• Subjective rating scales and checklists • Inconsistent standards • Multiple choice questions • Memorization • Instructor evaluation; limited to no student self-assessment • Student self-assessment uses pre-defined checklists ("satisfactory/ unsatisfactory/ needs improvement") that limit honest reflection	• Objective, valid criteria, rating scales, and rubrics utilized • Clear performance standards and criteria communicated • Essay questions • Critical thinking and problem-solving skills required • Case study development and critique • Self, peer, and instructor evaluation
Grading	• Checklists with point values marked if errors are committed. • Summative daily grades for clinical courses • Division between faculty members leads to unnecessary penalties (ex. Mrs. X is offended and counts off if student follows what Mrs. Y suggested)	• Formative feedback provided for areas of deficiency • Pass/fail assessments • Grades for key clinical experiences/ evaluations only

Faculty	• Not engaged in scholarly activities
	• Limited to no community service
	• Limited to no faculty practice
	• May or may not possess an advanced degree
	• Infrequent/ inconsistent calibration sessions
	• Relies on CE events and some moderately reputable journals (Dimensions, RDH etc.) to stay current with science and technology
		• Engaged in scholarly activities
		   o Conducting original research
		   o Contributing to reputable journals
		   o Scholarly presentations
		• Engagement in community service
		• Faculty practice
		• Possess a graduate degree
		• Frequent calibration sessions
		• Subscribes to and reads rigorously reputable journals (JDE, JDH etc.), in addition to CE events, to stay current on science and technology

APPENDIX D

UNM HUMAN RESEARCH REVIEW COMMITTEE

STUDY PROTOCOL APPLICATION

1) **Protocol Title**

The Making of a Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate

2) **IRB Review History***

N/A

3) **Objectives***

This study builds upon Darby and Walsh's theoretical model of Occupational versus Professional Characteristics of the dental hygienist. The research hypothesis is as follows: " Based on a pre-defined list of occupational and professional characteristics within dental hygiene education, what is the prevalence of educational methodologies oriented towards the Occupational Model versus the Professional Model?

4) **Background***

With society's healthcare system rapidly evolving to address the growing crisis of access to care, specifically oral health care, dental professionals must be equipped with the critical thinking and problem solving skills necessary to adapt to a changing environment. This evolution of care includes clinical environments outside of the traditional private practice setting; population groups with specific physical, emotional, and mental needs; and disadvantaged communities who lack the quantity and quality of responsible health care providers. The dental hygiene professional should be represented as one who can assume responsibility for much of this burden as a member of the primary health care team. Yet, it is unknown if dental hygiene programs are really educating students to meet these lofty standards as future professionals.

No previous research has examined how this theoretical model applies to dental hygiene education. This model is highly applicable to dental hygiene education because the values and practices of dental hygiene educators will greatly influence the perspective and trajectory of students under their tutelage. In order to best prepare dental hygiene students for an evolving healthcare climate, it is critical to understand current dental hygiene educational practices and recognize areas where educators are doing well, in addition to as areas that need renewed attention.

The significance of this study is to establish the prevalence of educational methodologies currently practiced which would orient students towards the anticipated professional dental hygiene role or if standards and strategies merely provide technical instruction.

5) **Inclusion and Exclusion Criteria***

Participants are eligible for inclusion in this study if they are currently employed as faculty members in good standing with a dental hygiene program. The final study sample will be targeting lead course instructors from among the entire population of dental hygiene educators. Lead course instructors may include pregnant women if they meet the crieteria established for the study. This study sample will not include adults who are unable to consent, individuals who are not yet adults, or prisoners.

6) **Study-Wide Number of Subjects***

The total number of participants who will be invited to participate is estimated to include 1,000-1,500 individuals.

7) **Study-Wide Recruitment Methods***

Through a snowballing- like sampling technique, study recruitment efforts will target dental hygiene program directors through a mass email. Program directors will be instructed to then forward the study invitation on to their lead course instructors for participation. See **Attachment 1** for a script of the invitation email.

8) **Study Timelines***

The study timeline for participants is two weeks time from when the initial email invitation is sent out. Individuals will be directed to a web-based survey link if they choose to participate; total participation time is estimated to be 15-20 minutes. The estimated completion date for this study, including data analysis, is November 2013.

9) **Study Endpoints***

The primary endpoint for data analysis and reporting is estimated to be November 2013. Secondary reporting and presentation of results is expected to continue through the end of 2015.

10) **Procedures Involved***

This study is designed to utilize a web-based survey instrument to collect descriptive data about participant's educational methodologies. The participant will click on the survey link from the invitation email and will be directed to the survey page housed within the PsychData website. Participants will be required to read the initial page of the survey, detailing the involved procedures,

risks, benefits, protection of confidentiality, and time commitment. They will be given the option to participate at the end of the first page. If they voluntarily choose to participate, they will click the "Continue" button located at the bottom of the page to start the survey. The survey consists of 29 questions addressing various aspects of clinical and didactic dental hygiene education, as well as participant demographics. Participants will be provided opportunity at the conclusion to include additional comments and thoughts pertaining to the study. At no portion of the survey will the participant be able to identify themselves. See **Attachment 2** for a copy of the survey instrument. See **Attachment 3** for the PsychData Security Statement detailing steps taken to protect the confidentiality of their survey participants and risk reduction of participant identification.

11) **Data and Specimen Banking***

All survey data is stored on the PsychData internal database and can only be accessed by authorized personnel. See **Attachment 3** for details regarding data storage by PsychData. The Principal Investigator (PI) and the designated proxy PI will be the only individuals able to access subsueqent survey data. The data will be downloaded to a secure private computer belonging to the proxy PI for analysis. The private computer is secured in a locked personal office and can only be accessed by the proxy PI. The data will be stored for 5 years following completion of the study and then will be deleted from the harddrive of the personal computer by the proxy PI.

12) **Data Management***

Upon completion of the survey timeline for participation, the data will be downloaded into the proxy PI's personal computer via the SPSS software package. The data will be analyzed using descriptive statistical tests in consultation with a statistician. Power anaylsis for this population recommends a minimum of 306 participants for 95% confidence rate with an alpha level of 0.05.

All questions and responses entered through PsychData's survey engine are encrypted and the unique key code is possessed only by authorized PsychData personnel. All survey pages are constructed such that a completed survey cannot be viewed by simply pressing the "Back" button (thus greatly reducing the chance that someone could "back up" to see previously entered data). PsychData's secure survey environment incorporates additional security measures to ensure that a participant's responses are not retrievable from their computer. First, all survey pages are entirely dynamic and database-generated (instead of static web pages that could be stored by the participant's computer). Second, all surveys

have redundant server-side code to ensure that they always load directly from our server and not from a prior cached version. Finally, upon completion of the survey, the survey window encourages the participant to close this browser window.

All surveys hosted with PsychData are encrypted using 256-bit SSL Technology (Secure Socket Layer) that is equivalent to the industry standard for securely transmitting credit card information over the Internet. This technology encrypts BOTH the questions displayed to the participants and their responses. Thus, all responses are instantly encrypted and remain so until they are received at the PsychData database. Interception of data when it is being transmitted between the Internet browser (i.e., Internet Explorer, FireFox, Safari, Chrome) and the PsychData database is HIGHLY unlikely. However, should interception of encrypted data occur, that data could not be decoded without the unique encryption key that is held only by PsychData.

Once research data is stored on a PsychData server, it is held in an isolated database that can only be accessed by a researcher with the correct username and password. PsychData employees do NOT examine customer data unless requested to do so by the account owner; additionally, those employees are trained in the ethics of research involving human subjects.

The PI has full control over the data including the ability to delete all data at the completion of their survey. All data stored at PsychData is backed up on a daily basis, held in a tightly secured facility (See **Attachment 3**- **PyschData's** **Security Statement**), and typically overwritten after seven days. Therefore, once a user has deleted their data, it will be permanently deleted from PsychData backups in about one week.

No identifiable information related to the participant will be included in the survey at any point. Additionally, the PI has taken the step of excluding IP addresses from the data collection to ensure the security and anonymity of the participants.

Survey data will only be limited to information regarding participant demographics (excluding identifiable information) and their educational methodologies within a dental hygiene program. The proxy PI is responsible for receipt and transmission of the data, including transmission of the data to a statistician trained in the ethics of research involving human subjects. The statistician will be provided access to the data via the proxy PI's PsychData account in the presence of the proxy PI and will provide consultation assistance in the analysis of the data.

13) **Provisions to Monitor the Data to Ensure the Safety of Subjects***

N/A- this study does not involve more than minimal risk to the participants

14) **Withdrawal of Subjects***

Participants may terminate or withdraw their participation at any point in the study by closing their browser window. Instances in which a participant may need to withdraw include insufficient time to committ to completing the survey or mental/ emotional fatigue in recalling specific examples of education methodologies from the previous academic year. Participants will be encouraged in the email invitation to complete the survey when they have sufficient time (15-20 minutes) to devote to answering questions. Participants will also be forewarned that survey questions will include methodologies practied in the previous academic year and will be encouraged to thoughtfully reflect on past strategies prior to engaging the survey. Participants will not be penalized or future educational services jeapordized in any manner should they choose to withdraw their participation early.

15) **Risks to Subjects***

Some questions may require detailed remembrance of course activities and procedures from the previous academic year (2012-2013).There are risks of stress, emotional distress, inconvenience and possible loss of privacy and confidentiality if participation is conducted on a public computer or mobile device.

16) **Potential Benefits to Subjects***

There is no direct benefit to the participants from engaging in this survey. Indirect benefits include contribution to the creation of best practices in dental hygiene education; expansion of the dental hygiene knowledge base, and growth in the recognition and respect of dental hygiene as a professional healthcare role.

17) **Vulnerable Populations***

This research is NOT conducted, funded, or otherwise subject to regulation by DHHS, EPA, or VA. This research, while possessing the potential to include pregnant women who meet the study criteria, involves no more than Minimal Risk to pregnant women and fetuses.

18) **Multi-Site Research***

N/A

19) **Community-Based Participatory Research***

N/A

20) **Sharing of Results with Subjects***

Results will be disseminated to the participants via publication of findings in a scholarly journal and potentially shared via public venues at professional association meetings.

21) **Setting**

The survey will be administed from the proxy PI's personal office via the web-based survey engine PsychData. Participants will have the freedom to choose their place of participation; possible choices could include their personal office, home, or mobile device in any setting of their choosing.

22) **Resources Available**

The PI and proxy PI have over 20 years of combined experience in dental hygiene educaton and administration. Educational expertise includes web-based modes of communication and distance learning. The PI and proxy PI are both licensed as dental hygienists and their combined wealth of experiences in dental hygiene education situates them as well-qualified individuals to oversee research into dental hygiene educational methodologies.

Participants will be recruited from a publicly avaliable list of dental hygiene program directors. The number of potential participants could be as many as 1000-1,500 faculty members. Due to the convenience and accessibility of the Internet, it is highly feasible to contact all entry-level dental hygiene program directors via a mass email and request their assistance in recruiting their faculty members to participate in this study. The short time commitment for participation (15-20 minutes) does not mandate a long time frame to leave the survey available. Participants will receive 2 reminder emails within the 2 week window, encouraging them to participate in the survey.

As incentive for participation, individuals will be given the opportunity to enter into a drawing for one (1) of three (3) iTunes giftcards upon completion of the survey. To protect confidentiality, upon completion of the last survey question, participants will be directed to either close their browser window if they do not wish to enter the drawing or to click "continue" to be taken to a separate survey where they can choose to enter their personal contact information. The two surveys are linked together but participants will not be able to press the "back" button on their web browser to re-access the research survey. The drawing will request contact information from the participant, which will include their first and last

name, best contact email address, and best contact phone number. Winners will be notified via email and then by phone if necessary no later than 2 weeks after the endpoint of the survey. The proxy PI will oversee the drawing (see **Attachment 4- Incentive**).

The proxy PI will be dedicating significant man hours over the course of this semester to oversee this research study as part of the requirements for the Masters level Thesis course.

23) **Prior Approvals**

N/A

24) **Recruitment Methods**

Through a snowballing- like sampling technique, study recruitment efforts will target dental hygiene program directors through a mass email. Contact information for the program directors is obtained from a publicly available list of all dental hygiene programs on the American Dental Hygienists' Association website. Participants will be recruited upon receipt of IRB approval. The number of potential participants could be as many as 1000-1,500 faculty members. Due to the convenience and accessibility of the Internet, it is highly feasible to contact all entry-level dental hygiene program directors via a mass email and request their assistance in recruiting their faculty members to participate in this study. Program directors will be instructed to forward the study invitation on to their lead course instructors for participation. See **Attachment 1** for a script of the invitation email.

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25) **Local Number of Subjects**

The local number of participants to be enrolled is unknown at this point.

26) **Confidentiality**

N/A- This is not a multicenter study.

27) **Provisions to Protect the Privacy Interests of Subjects**

Participants will be encouraged to participate in the privacy of their personal office or home. Participants will receive explaination of the privacy and confidentiality measures incorporated into the PsychData survey when reading the survey introduction and consent on the first page of the survey. Participants will be instructed to thoughtfully reflect on their previous and current educational methodologies in hopes of bringing to light effective educational strategies they have adopted.

28) **Compensation for Research-Related Injury**

N/A

29) **Economic Burden to Subjects**

N/A

30) **Consent Process**

Participants will be invited to participate in the survey via an email containing a study introduction, invitation to participate, and a web-based link to the survey instrument. Any waiting period between reading the email and participating in the survey is dependent upon the choice of the participant. Participants will be informed that they have two weeks to participate in the survey from the date of email receipt.

Consent procedures will follow *HRP-090 SOP: Informed Consent Process for Research*. Upon clicking on the survey link from the invitation email, participants will encounter the first page of the survey detailing survey procedures and information related to informed consent. Participants will be instructed to click the "continue" button if they have read and understand the previous paragraphs detailing the study information. Participants will be notified in writing above the "continue" button that by clicking the button, they are providing their voluntary consent to participate in the research study. Participants are provided the contact information for the PI and proxy PI on the initial page should they have any questions or concerns about the research study prior to engaging in the survey. Ongoing consent will be demonstrated by the participant's continual response to survey questions.

31) **Process to Document Consent in Writing**

Consent procedures will follow *HRP-090 SOP: Informed Consent Process for Research*. This research involves no more than minimal risk of harm to

the research participants. Participants will be providing voluntary consent to participate in this research study (see **Attachment 5- Consent**).

32) **Drugs or Devices**

N/A

APPENDIX E

HRRC APPROVAL LETTER

UNM HEALTH SCIENCES CENTER

Human Research Review Committee Human Research Protections Office

November 5, 2013

Demetra Logothetis dlogothetis@salud.unm.edu

Dear Dr. Logothetis: On 11/5/2013, the HRRC reviewed the following submission:

Type of Review: Title of Study:

Investigator: Study ID: Funding: Grant ID: IND, IDE, or HDE:

Submission Summary: Documents Reviewed:

Review Category: Determinations/Waivers:

Initial Study The Making of a Professional: How Dental Hygiene Education is

Preparing for a Changing Health Care Climate Demetra Logothetis 13-492 None

None None-510-HRRC_TEMPLATE_LETTER_Approval Approve

New Study submission • Consent and Attachment 2 Psych Data Survey submitted: 09.11.13

• HRP Protocol v09.10.13 • Attachment 1 Script Invitation for Participation submitted: 09.11.13 • Attachment 3 PsychData Security Statement submitted: 09.11.13 • Attachment 4 Survey Incentive submitted: 09.11.13

EXEMPTION: Categories (1) Educational settings(2) Tests, surveys, interviews, or observation Waiver of consent documentation HIPAA does not apply

The HRRC approved the study from 11/5/2013.

Because it has been granted exemption, this research is not subject to continuing review. To document consent, use the consent documents that were approved and stamped by the IRB. Go to the Documents tab to download them. This determination applies only to the activities described in the submission and does not apply should any changes be made to these documents. If changes are being considered and there are questions about whether HRRC review is required, please submit a study modification to the HRRC for a determination. A change in the research may disqualify this research from the current review category. You can create a modification by clicking Create Modification / CR within the study.

The University of New Mexico • MSC08 4560 • 1 University of New Mexico • Albuquerque, NM 87131-0001 • Phone 505.272.1129 • Fax 505.272.0803 • **hsc.unm.edu/som/research/hrrc** • BMSB B71

In conducting this study, you are required to follow the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library.

Sincerely,

Mark Holdsworth, PharmD

Executive Chair

The University of New Mexico • MSC08 4560 • 1 University of New Mexico • Albuquerque, NM 87131-0001 • Phone 505.272.1129 • Fax 505.272.0803 • **hsc.unm.edu/som/research/hrrc** • BMSB B71

APPENDIX F

RECRUITMENT LETTER

Dear Fellow Dental Hygiene Educators,

My name is Connie Beatty RDH, BSDH and I am a candidate for the Master of Science in Dental Hygiene degree at the University of New Mexico, Department of Dental Medicine, Division of Dental Hygiene. I am conducting a survey evaluating dental hygiene educational methodologies and would like your participation.

My survey is titled: "The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate " It studies the application of Darby and Walsh's Occupational versus Professional Model to dental hygiene education. For those not familiar with the model, the Occupational component essentially states that dental hygiene is a task-oriented, procedure driven field where the clinician assumes little to no responsibility for his or her actions, instead focusing on disease management. The Professional paradigm of that model then theorizes the opposite: dental hygiene is a knowledge-driven professional role, which utilizes critical thinking and problem solving skills to address overall wellness through oral health prevention and intervention.

This model is highly applicable to dental hygiene education because the values and practices of dental hygiene educators will greatly influence the perspective and trajectory of students under their tutelage. In order to best prepare dental hygiene students for an evolving healthcare climate, it is critical to understand current dental hygiene educational practices and recognize areas where we as educators are doing well as well as areas that need renewed attention.

Please take a few minutes to evaluate if this is a research study in which you would feel comfortable participating. Participation is completely voluntary and the survey itself should take 15-20 minutes of your time. Eligible participants who complete the survey will be able to enter a drawing to win 1 of 3 iTunes gift cards. All comments, concerns, or questions about participation may be directed to my email address (cbeatty@unm.edu) and I will gladly provide assistance, as I am able. Your generous contribution of time and knowledge to this research study is greatly appreciated1

To participate, please click on the following link: Please complete this no later than 2 weeks from receipt of this email, or September 27th, whichever comes first.

https://www.psychdata.com/s.asp?SID=155956&Data=EnterData

Sincerely,
Connie Beatty RDH, BSDH
Candidate, Master of Science in Dental Hygiene
The University of New Mexico
cbeatty@unm.edu

SURVEY INSTRUMENT

The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate

You are being asked to participate in a research study that is being conducted by Connie E. Beatty RDH, BSDH in part to fulfill requirements for the Master of Science in Dental Hygiene degree from the University of New Mexico. The Principal Faculty Investigator for this study is Demetra Logothetis RDH, MSDH. This research is studying Educational Methodologies.

This study seeks to apply Darby and Walsh's Occupational versus Professional model to dental hygiene education in order to ascertain how dental hygiene programs are best preparing students for a changing healthcare environment. No previous research has been conducted on this topic, so your responses may help generate recommendations for best practices in dental hygiene education.

You are being asked to participate in this study because of your experience as a lead course instructor within a dental hygiene program. This study is recruiting educators from all dental hygiene programs across the United States.

This form will explain the research study, and will also explain the possible risks as well as the possible benefits to you. If you have any questions, please ask one of the study investigators.

If you agree to participate, the following things will happen:
You will be asked questions regarding your past and current educational methodologies regarding clinical and didactic components of dental hygiene education.

Participation: This study will take a total of 15-20 minutes; this survey may be conducted at any time of your choosing. There are a total of 29 questions with an

optional space for comments at the end. Please take your time to thoughtfully and honestly answer each question based on your past and current educational experiences. You are encouraged to talk to friends, family, or fellow coworkers about your participation in this study if you have any concerns or questions.

Risks: Some questions may require detailed remembrance of course activities and procedures from the previous academic year (2012-2013).There are risks of stress, emotional distress, inconvenience and possible loss of privacy and confidentiality if participation is conducted on a public computer or mobile device. For more information about risks and side effects, ask the investigator.

Benefits: Your responses will contribute to the creation of best practices in dental hygiene education; expansion of the dental hygiene knowledge base, and growth in the recognition and respect of dental hygiene as a professional healthcare role.

Privacy: We will take measures to protect the security of all your personal information. All responses entered into the survey become encrypted information that cannot be converted without the unique key possessed by PsychData authorized personnel. PsychData surveys are constructed so that you or someone else cannot press the "back" button on your internet browser and thus view your confidential information. Furthermore, this survey is designed so that information is not stored on your computer or mobile device via "cookies" or other cached sources of data. The survey is database driven and coded so that it loads directly from the server website. You will be encouraged to close your browser window upon completion of the survey. Information contained in your study records is used by study staff and, in some cases it will be shared with the sponsor of the study. The University of New Mexico Institutional Review Board (IRB) that oversees human subject research and/or other entities may be permitted to access your records. There may be times when we are required by law to share your information. However, your name will not be used in any published reports about this study. All survey responses will be anonymous. No portion of this survey will be able to identify you in any manner, including IP addresses of the computer or mobile device used to participate in the study.

Cost: The only cost to you for your participation is the 15-20 minutes of your time to answer questions.

Compensation: Upon completion of the survey, all study participants will be eligible to enter a drawing for one (1) of three (3) iTunes gift cards.

Funding Source: This study is being funded in its entirety by the graduate student investigator, Connie E. Beatty RDH, BSDH.

Participation: Your participation in this study is completely voluntary. You have the right to choose not to participate or to withdraw your participation at any point

in this study. If you should choose to withdrawal from the survey before completing it, you may exit the survey webpage or close your browser.

Contact Information: If you have any questions, concerns or complaints at any time about the research study, Demetra Logothetis or her associates will be glad to answer them at (505) 272-4513. If you need to contact someone after business hours or on weekends, please email Connie Beatty at cbeatty@unm.edu. If you would like to speak with someone other than the research team, you may call the UNMHSC HRPO at (505) 272-1129. If you have questions regarding your rights as a research participant, you may call the UNMHSC HRPO at (505) 272-1129. The HRPO is a group of people from UNM and the community who provide independent oversight of safety and ethical issues related to research involving human participants. For more information, you may also access the IRB website at http://hsc.unm.edu/som/research/hrrc/irbhome.shtml.

You will be informed of any significant new findings that become available during the course of the study, such as changes in the risks or benefits resulting from participating in the research or new alternatives to participation that might change your mind about participating.

CONSENT
You are making a decision whether to participate in this study. If you have read and understand the above statements, please click on the "Continue" button below to indicate your consent to participate in this study.

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The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate
Personal Demographics

*
1. Please identify your highest educational credential:

--Select--
 - A. Bachelors Degree [Value=1]
 - B. Masters Degree [Value=2]
 - C. Doctorate Degree (please identify type of degree: DDS, DMD, EdD, PhD) [Value=3]
 - Other (please specify) [Value=4]
Other:
*
2. Please identify the major concentration of your highest degree:

--Select--
 - Dental Hygiene major/ concentration [Value=1]
 - Non-Dental Hygiene major/ concentration [Value=2]
*
3. How many years of experience do you have in dental hygiene education?

--Select--
 - 0-5 years [Value=1]
 - 6-10 years [Value=2]
 - 11-15 years [Value=3]
 - 16-20 years [Value=4]
 - More than 21 years [Value=5]
*
4. What type of institutional setting do you work?

--Select--
 - Community College [Value=1]
 - Proprietary School (career college/ technical institute) [Value=2]
 - University, dental school [Value=3]
 - University, non dental school [Value=4]
 - Other (please specify) [Value=5]
Other:
*
5. Identify your faculty status for the 2013-2014 academic year:

--Select--
 - Adjunct [Value=1]
 - Full time [Value=2]
 - Part time [Value=3]
 - Retired, teaching part time [Value=4]
 - Retired, no longer teaching [Value=5]
 - No longer teaching [Value=6]
*
6. How much longer to you anticipate yourself actively teaching?

--Select--
 - 0-5 years [Value=1]
 - 6-10 years [Value=2]
 - 11-15 years [Value=3]
 - 16-20 years [Value=4]
 - More than 21 years [Value=5]
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The Making of A Professional: How Dental Hygiene Education is Preparing for a
Changing Healthcare Climate
7. In the **2012-2013** academic year, what was your level of personal engagement

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in the following, non-teaching related activities?

	No Involvement	Little Involvement	Involved	Moderately Involved	HIghly Involved
A. Community Service	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
B. Faculty Practice/ Private Clinical Practice	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
C. Institutional Service	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
D. Original Research	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
E. Presenting Continuing Education Courses or Workshops	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
F. Professional Service	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
G. Scholarly Publications	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

8. Please rate the following resources according to your frequency of use as an educator during the **2012-2013** academic year:

	Did Not Utilize	Utilized Very Little	Utilized Somewhat	Utilized Moderately	Highly Utilized
A. ADEA, ADHA, or university-sponsored dental hygiene educator CEs	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
B. Dental or dental hygiene CEs (scientific and/or technical as required for licensure)	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
C. Popular resources like RDH or	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

Hygienetown

D. Peer reviewed resources like Dimensions of Dental Hygiene or Access	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
E. Peer reviewed journals like JDE or JDH	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
F. Textbooks and publisher resources	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
G. Product representatives	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

9. How many credit hours are in your entire curriculum, including non-dental hygiene requirements?

10. How many credit hours are in your dental hygiene- specific curriculum?

11. What degree is awarded upon completion of your entry-level dental hygiene program?

--Select--
 - Associate of Applied Science in Dental Hygiene [Value=1]
 - Associate of Science in Dental Hygiene [Value=2]
 - Bachelor of Applied Science in Dental Hygiene [Value=3]
 - Bachelor of Science in Dental Hygiene [Value=4]
 - Other (please specify) [Value=5]
Other:
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The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate
Clinical Instruction

12. For the 2013-2014 academic year, will you be teaching in a clinical course- either as the course lead instructor or as an assistant clinical instructor?

A. Yes, course lead instructor [Value=1]

B. Yes, assistant clinical instructor [Value=2]
C. No [Value=3]
13. How important is calculus removal as part of the patient care experience?

	Not Important	Of Little Importance	Important	Moderately Important	HIghly Important
Calculus removal is	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

14. Which one (1) evaluation strategy carries the most weight towards the final grade in a senior student's final clinical course?

A. Capstone patient experience [Value=1]
B. Mock board exam [Value=2]
C. Specific competency or performance evaluation (please specify) [Value=3]
Other (please specify) [Value=4]

*
15. Please rank the following strategies according to your frequency of use for developing critical thinking skills within your clinical courses.
(1 = most frequently used; 6 = little to no use)

  Research assignments (can be scientific literature, new products, or new technology)
  Reviewing and analyzing cases
  Self reflection and assessment
  Student development of cases
  Treatment planning exercises
  Writing Assignments

16. How are self-reflection and assessment skills incorporated within your clinical courses (select all that apply)?

A. Students complete a form or checklist [Checked=1]
B. Students create a journal, blog entry, or wiki entry [Checked=1]
D. Students generate a portfolio throughout the semester [Checked=1]
C. Students provide verbal feedback [Checked=1]
D. There is no formal system for self assessment within the clinical courses [Checked=1]
Other (please specify) [Checked=1]

17. Which of the following represents grading procedures within your clinical environment (select all that apply)?

	Not Utilized	Very Little Utilization	Utilized	Moderate Utilization	Highly Utilized
A. Checklists with assigned point values	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
B. Daily grading of all tasks and procedures	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
C. Formative feedback	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
D. Pass/ fail assessments	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
E. Summative grades for key clinical experiences	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

18. Within the past two (2) years, have you participated in a clinical education methodologies course, workshop, or continuing education event?

A. Yes [Value=1]
B. No [Value=2]

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The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate

Clinical Vignette

A senior student in their last semester has just completed non-surgical periodontal therapy in the lower right quadrant for a client with an advanced classification of disease. The student has requested your review and approval to move forward. Upon examination, you find three (3) large subgingival deposits still present, and the marginal tissue around the lower anterior teeth is showing signs of trauma from incorrect instrumentation.

19. What do you believe is the best type of feedback to give the student in this situation (select all that apply)?

Formative feedback identifies the student's fundamental errors with no penalty given [Checked=1]
Points are deducted from the student's daily grade for the calculus errors and

trauma [Checked=1]
The student's daily grade/ patient grade is penalized [Checked=1]
The student is identified as needing remediation [Checked=1]
The instructor should make time to sit with the student and provide feedback on observed instrumentation techniques [Checked=1]
Other (please specify) [Checked=1]

20. What was the student's fundamental error in this situation?

A. Failure to ask for assistance in a difficult situation [Value=1]
B. Failure to properly assess the patient [Value=2]
C. Failure to properly plan implementation of care [Value=3]
D. Failure to properly implement care [Value=4]
Other (please specify) [Value=5]

21. Identify strategies you currently use in similar situations to help students maximize the experience of making a mistake.

	Not Utilized	Utilized Very Little	Utilized	Utilized Moderately	Highly Utilized
A. The errors are generically discussed as a team after the clinic session and all students are invited to contribute feedback	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
B. The errors are discussed in the clinical seminar course as a reminder to the class of where their skill level should be	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
The student is required to reflect in writing why the error occurred and how he or she could do things differently next time	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

The student is verbally asked why the error occurred and how he or she could do things differently next time	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

22. How does thorough calculus removal, or the lack thereof, reflect the competency level of a clinician?

A. Thorough calculus removal is the defining demonstration of a clinician's competency in providing patient care [Value=1]
B. Thorough calculus removal is a component of competent patient care but not the defining quality [Value=2]
C. Thorough calculus removal is not at all reflective of a clinician's competency in providing patient care [Value=3]

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The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate

Didactic Instruction

23. In the **2012-2013** academic year, rate the following evaluation strategies according to your frequency of use in your didactic courses:

	Do Not Use	Used Infreque ntly	Used Somew hat	Used Moderat ely	Highly Used
Case Study/ Testlet	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Competencies	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Decision Tree	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Essay Test	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Independent Research Project	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Logic Model	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

	]	]	]	]	]
Mock Exam	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Multiple Choice Test	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Observation Checklists	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Oral Exam	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Oral Presentation	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
OSCE	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Portfolio	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Reflections	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Rubrics	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Self Evaluations	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Standardized Patient	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

24. Rate the effectiveness of the following strategies in assessing critical thinking and problem solving skills:

	Not Effective	Very Little Effectiveness	Effective	Moderately Effective	Highly Effective
Case Study/ Testlet	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Competencies	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Decision Tree	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Essay Test	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Independent Research Project	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Logic Model	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Mock Exam	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Multiple Choice Test	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Observation Checklists	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Oral Exam	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Oral Presentation	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
OSCE	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Portfolio	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Reflections	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Self Evaluations	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Standardized Patient	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

25. How are critical thinking skills developed within your didactic courses (select all that apply)?

Individual or team learning activities/ assignments [Checked=1]
Quizzes over reading assignments [Checked=1]
Research assignments (scientific literature, new products and/or new technology) [Checked=1]
Reviewing and analyzing cases [Checked=1]
Self reflection and assessment [Checked=1]
Student development of cases [Checked=1]
Treatment planning exercises [Checked=1]
Writing assignments (paper or electronic) [Checked=1]
Other (please specify) [Checked=1]

26. How are self reflection and assessment skills incorporated within your didactic courses? Rate the following methodologies according to your frequency of use.

	Not Used	Used Very Little	Used	Used Moderately	Highly Used
Students create a journal, blog/wiki entry, or discussion board entry	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Students fill out a form or checklist	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Students provide verbal feedback	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

27. Which one (1) evaluation strategy usually carries the most weight towards the final grade in your didactic courses?

A. Completion of course objectives or competencies [Value=1]
B. Learning activities or assignments [Value=2]
C. Multiple choice exam(s) [Value=3]
D. Oral presentation (i.e. power point) [Value=4]
E. Research project or paper [Value=5]
F. Group assignment [Value=6]
G. Writing assignment (paper or electronic) [Value=7]
Other (please specify) [Value=8]

28. Based on the courses you taught during the **spring 2013 semester**, please identify the following **teaching** strategies you used to conduct a typical didactic class session.

	Did Not	Used	Used	Used	Highly

	Use	Infrequently		Moderately	Used
Case Studies	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Clinical Application Exercises	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Dialogues	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Group Learning Activities	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Individual Learning Activities	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Power Point Presentation (Traditional Lecture Format)	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Research Assignments	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Writing Assignments	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]
Socratic Questioning	[Value=1]	[Value=2]	[Value=3]	[Value=4]	[Value=5]

*

29. What do you believe is the most common reason research activities are not utilized or required in didactic courses?

A. Class time constraints [Value=1]
B. Curriculum constraints- too many other topics to cover [Value=2]
C. Developing research skills is the responsibility of a specific faculty member (does not fall within my teaching responsibilities) [Value=3]
D. Instructor's lack of familiarity or comfort with research skills [Value=4]
Other (please specify) [Value=5]

(Optional)
Please provide any additional comments you have regarding dental hygiene educational methodologies, or the application of Darby and Walsh's Occupational vs. Professional Model to dental hygiene education.

(1000 characters remaining)

Thank you for your participation in this survey!
This now concludes all the questions for this survey.

If you wish to enter your name into a drawing for one (1) of three (3) iTunes gift cards, please click the "continue" button below. Once you click "continue," you or someone else will not be able to go back and view information entered into the survey. If you do not wish to be entered into the drawing, you may exit the survey at this time by closing your browser window.

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The Making of A Professional: How Dental Hygiene Education is Preparing for a Changing Healthcare Climate
Thank you for your participation in this survey!
This now concludes all the questions for this survey.

For maximum confidentiality, please close this window.

SURVEY INCENTIVE

iTunes Drawing

This drawing is for eligible participants who completed the previous survey, ***"The Making of A Professional: How Dental Hygiene Education is Preparing for A Changing Healthcare Climate."***

*1)
Please provide your first and last name:

*2)
Please provide a current email address:

*3)
Please provide a current daytime phone number:

Winners will be contacted within two (2) weeks of the survey completion date by the graduate student investigator, Connie E. Beatty RDH, BSDH.

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iTunes Drawing
Thank you!

For maximum confidentiality, please close this window.

APPENDIX I

STATISTICAL TABLES

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Table 1

Frequencies and Percentages for Categorical Demographic Variables
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	n	%
Education Level		
Bachelor's Degree	18	11.5
Master's Degree	118	75.2
Doctorate Degree (e.g., DDS, MD)	20	12.7
Other	1	.6
Degree Concentration		
Dental Hygiene	52	33.1
Non-Dental Hygiene	105	66.9
Years of Dental Hygiene Education Experience		
0–5 years	17	10.8
6–10 years	30	19.1
11–15 years	28	17.8
16–20 years	27	17.2
21 years or more	55	35.0
Institutional Setting		
Community College	89	56.7
Career College or Technical Institute	16	10.2
University with Dental School	24	15.3
University with No Dental School	26	16.6
Other	2	1.3
Faculty Status (2013–2014)		
Adjunct	3	1.9

Full-time	149	94.9
Part-time	4	2.5
No Longer Teaching	1	.6
Future Years of Teaching		
0–5 years	43	27.4
6–10 years	57	36.3
11–15 years	25	15.9
16–20 years	23	14.6
21 years or more	9	5.7

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Table 2

Frequencies and Percentages for Demographics by Degree Awarded Upon Completion of Program

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	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ^2	*p*
Education Level					3.13	.373
Bachelor's Degree	16	13.7	1	3.8		
Master's Degree	85	72.6	23	88.5		
Doctorate Degree (e.g., DDS, MD)	15	12.8	2	7.7		
Other	1	.9	0	.0		
Degree Concentration					1.09	.297
Dental Hygiene	37	31.6	11	42.3		
Non-Dental Hygiene	80	68.4	15	57.7		
Years of Dental Hygiene Education Experience					5.06	.281
0–5 years	14	12.0	3	11.5		
6–10 years	19	16.2	8	30.8		
11–15 years	25	21.4	2	7.7		
16–20 years	20	17.1	3	11.5		
21 years or more	39	33.3	10	38.5		
Institutional Setting					75.38	< .001
Community College	81	69.2	0	.0		
Career College or Technical Institute	14	12.0	0	.0		
University with Dental School	6	5.1	17	65.4		
University with No Dental School	15	12.8	9	34.6		
Other	1	.9	0	.0		

Faculty Status (2013–2014)					.80	.851
Adjunct	2	1.7	0	.0		
Full-time	111	94.9	25	96.2		
Part-time	3	2.6	1	3.8		
No Longer Teaching	1	.9	0	.0		
Future Years of Teaching					1.91	.752
0–5 years	34	29.1	5	19.2		
6–10 years	41	35.0	12	46.2		
11–15 years	19	16.2	3	11.5		
16–20 years	16	13.7	4	15.4		
21 years or more	7	6.0	2	7.7		

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Table 3

Frequencies and Percentages for Methodologies of Personal Engagement

	n	%
Community Service		
Occupational	31	21.2
Professional	115	78.8
Faculty Practice/Private Practice		
Occupational	74	51.0
Professional	71	49.0
Institutional Service		
Occupational	23	15.9
Professional	122	84.1
Original Research		
Occupational	81	56.3
Professional	63	43.8
Presenting CE Courses or Workshops		
Occupational	44	30.1
Professional	102	69.9
Professional Service		
Occupational	20	13.8
Professional	125	86.2
Scholarly Publications		
Occupational	93	63.7
Professional	53	36.3

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Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

Table 4

Frequencies and Percentages for Methodologies of Educator Resources

	n	%
ADEA, ADHA, or Dental Hygiene Educator CEs		
Occupational	17	11.7
Professional	128	88.3
Dental CEs		
Occupational	125	86.2
Professional	20	13.8
Peer-Reviewed Journals Like JDE or JDH		
Occupational	17	11.7
Professional	128	88.3
Peer-Reviewed Resources Like Dimensions of Dental Hygiene or Access		
Occupational	19	13.1
Professional	126	86.9
Popular Resources Like RDH or Hygienetown		
Occupational	76	52.8
Professional	68	47.2
Product Representatives		
Occupational	52	35.9
Professional	93	64.1
Clinical Education Methodology Courses		
Occupational	13	9.4
Professional	126	90.6

Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

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Table 5

Frequencies and Percentages for Methodologies of Calculus Removal Importance

	n	%
Importance of Calculus Removal		
Occupational	129	92.8
Professional	10	7.2
Importance of Calculus Removal in Clinician's Competency		
Occupational	14	10.2
Professional	123	89.8

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Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

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Table 6

Frequencies and Percentages for Methodologies of Self-Reflection in Clinical Courses

	n	%
Student Journal, Blog, or Wiki Entry		
Not Professional	82	52.2
Professional	75	47.8
Student Portfolio		
Not Professional	95	60.5
Professional	62	39.5
Student Verbal Feedback		
Not Professional	96	61.1
Professional	61	38.9
Students Completing Form or Checklist		
Not Occupational	76	48.4
Occupational	81	51.6
No Formal System		
Not Occupational	153	97.5
Occupational	4	2.5

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Table 7

Frequencies and Percentages for Methodologies of Clinical Grading Procedures

	n	%
Cumulatively for Key Clinical Experiences		
Occupational	12	8.8
Professional	125	91.2
All Tasks and Procedures Daily		
Occupational	124	89.2
Professional	15	10.8
Checklists With Assigned Point Values		
Occupational	103	78.0
Professional	29	22.0
Formative Feedback		
Occupational	2	1.4
Professional	137	98.6

Note. Frequencies not summing to $N = 157$ and percentages not summing to 100 reflect missing data.

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Table 8

Frequencies and Percentages for Methodologies of Student Feedback and Errors

	n	%
Formative Feedback With No Penalty on Senior Exam		
Not Professional	120	76.4
Professional	37	23.6
Fundamental Error on Senior Exam		
Occupational	53	43.8
Professional	68	56.2
Course Discussion of Errors on Senior Exam		
Occupational	100	74.6
Professional	34	25.4
Self-Reflective Writing After Senior Exam		
Occupational	50	37.0
Professional	85	63.0
Team Discussion as Feedback on Senior Exam		
Occupational	80	59.7
Professional	54	40.3
Verbal Questioning About Errors on Senior Exam		
Occupational	3	2.2
Professional	133	97.8
Identifying Needed Remediation on Senior Exam		
Not Occupational	106	67.5
Occupational	51	32.5
Penalizing Daily/Patient Grade for Senior Exam		
Not Occupational	125	79.6

Occupational	32	20.4

Point Deduction From Daily Grade for Senior
Exam

Not Occupational	85	54.1
Occupational	72	45.9

Providing Feedback on Instrumentation
Techniques on Senior Exam

Not Professional	33	21.0
Professional	124	79.0

Most Weighted Senior Evaluation Strategy
in Final Clinical Course

Occupational	19	18.3
Professional	85	81.7

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Note. Frequencies not summing to *N* = 157 and percentages not summing to
100 reflect missing data.

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Table 9

Frequencies and Percentages for Methodologies of Didactic Evaluation Strategies: Exams, Projects, and Presentations

	n	%
Case Study/Testlet		
Occupational	1	.8
Professional	132	99.2
Essay Test		
Occupational	29	21.8
Professional	104	78.2
Independent Research Project		
Occupational	11	8.3
Professional	121	91.7
Mock Exam		
Occupational	109	82.0
Professional	24	18.0
Multiple Choice Test		
Occupational	125	95.4
Professional	6	4.6
Oral Exam		
Occupational	66	49.6
Professional	67	50.4
Oral Presentation		
Occupational	120	90.9
Professional	12	9.1
OSCE		
Occupational	54	41.9
Professional	75	58.1

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Table 10

Frequencies and Percentages for Methodologies of Didactic Evaluation Strategies: Preparatory Exercises

	n	%
Competencies		
Occupational	11	8.4
Professional	120	91.6
Logic Model		
Occupational	58	44.3
Professional	73	55.7
Observation Checklists		
Occupational	91	68.9
Professional	41	31.1
Reflections		
Occupational	25	18.9
Professional	107	81.1
Rubrics		
Occupational	3	2.3
Professional	129	97.7
Self Evaluations		
Occupational	22	16.9
Professional	108	83.1
Standardized Patient		
Occupational	59	45.0
Professional	72	55.0

Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

Table 11

Frequencies and Percentages for Methodologies of Critical Thinking Development in Didactic Courses

	n	%
Reviewing and Analyzing Cases		
Not Professional	35	22.3
Professional	122	77.7
Self-Reflection and Assessment		
Not Professional	59	37.6
Professional	98	62.4
Individual or Team Learning Activities		
Not Professional	33	21.0
Professional	124	79.0
Quizzes on Reading Assignments		
Not Occupational	76	48.4
Occupational	81	51.6
Research Assignments		
Not Professional	45	28.7
Professional	112	71.3
Student Development of Cases		
Not Professional	102	65.0
Professional	55	35.0
Treatment Planning Exercises		
Not Professional	51	32.5
Professional	106	67.5
Writing Assignments		
Not Professional	58	36.9
Professional	99	63.1

Table 12

Frequencies and Percentages for Methodologies of Self-Reflection in Didactic Courses

	n	%
Journal, Blog/Wiki Entry, or Discussion Board Entry		
Occupational	42	32.3
Professional	88	67.7
Student Form or Checklist		
Occupational	92	72.4
Professional	35	27.6
Student Verbal Feedback		
Occupational	22	17.3
Professional	105	82.7

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Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

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Table 13

Frequencies and Percentages for Methodologies of Didactic Course Teaching Strategies

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	n	%
Case Studies		
Occupational	8	6.1
Professional	123	93.9
Clinical Application Exercises		
Occupational	11	8.5
Professional	118	91.5
Dialogues		
Occupational	20	15.4
Professional	110	84.6
Group Learning Activities		
Occupational	4	3.1
Professional	124	96.9
PowerPoint Presentation		
Occupational	118	90.1
Professional	13	9.9
Research Assignments		
Occupational	14	10.9
Professional	114	89.1
Socratic Questioning		
Occupational	23	37.1
Professional	39	62.9
Writing Assignments		
Occupational	6	4.7
Professional	123	95.3

Most Weighted Evaluation Strategy

Occupational	74	59.7
Professional	50	40.3

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Note. Frequencies not summing to *N* = 157 and percentages not summing to 100 reflect missing data.

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Table 14

Frequencies and Percentages for Methodologies of Personal Engagement by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree		χ^2	p
	n	%	n	%		
Community Service					3.56	.059
Occupational	21	17.9	9	34.6		
Professional	96	82.1	17	65.4		
Faculty/Private Practice					.26	.608
Occupational	60	51.7	12	46.2		
Professional	56	48.3	14	53.8		
Institutional Service					.02	.901
Occupational	19	16.4	4	15.4		
Professional	97	83.6	22	84.6		
Original Research					4.14	.042
Occupational	70	60.3	10	38.5		
Professional	46	39.7	16	61.5		
Presenting CE Courses or Workshops					1.58	.209
Occupational	37	31.6	5	19.2		
Professional	80	68.4	21	80.8		
Professional Service					.17	.680
Occupational	17	14.7	3	11.5		
Professional	99	85.3	23	88.5		
Scholarly Publications					9.27	.002
Occupational	82	70.1	10	38.5		
Professional	35	29.9	16	61.5		

Table 15

Frequencies and Percentages for Methodologies of Educator Resources by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	n	%	χ²	p
ADEA, ADHA, or Dental Hygiene Educator CEs					.45	.500
Occupational	15	12.8	2	8.0		
Professional	102	87.2	23	92.0		
Dental CEs					2.58	.108
Occupational	103	88.8	20	76.9		
Professional	13	11.2	6	23.1		
Peer-Reviewed Journals Like JDE or JDH					.01	.940
Occupational	14	12.1	3	11.5		
Professional	102	87.9	23	88.5		
Peer-Reviewed Resources Like Dimensions of Dental Hygiene or Access					3.11	.078
Occupational	12	10.3	6	23.1		
Professional	104	89.7	20	76.9		
Popular Resources Like RDH or Hygienetown					14.77	< .001
Occupational	70	60.9	5	19.2		
Professional	45	39.1	21	80.8		
Product Representatives					4.15	.042
Occupational	47	40.5	5	19.2		
Professional	69	59.5	21	80.8		

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Clinical Education Methodology Courses					3.86	.049
Occupational	8	7.2	5	20.0		
Professional	103	92.8	20	80.0		

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Table 16

Frequencies and Percentages for Methodologies of Calculus Removal Importance by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ²	*p*
Importance of Calculus Removal					2.07	.150
Occupational	106	95.5	22	88.0		
Professional	5	4.5	3	12.0		
Importance of Calculus Removal in Clinician's Competency					1.37	.243
Occupational	13	11.9	1	4.0		
Professional	96	88.1	24	96.0		

Table 17

Frequencies and Percentages for Methodologies of Self-Reflection in Clinical Courses by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree		χ^2	p
	n	%	*n*	%		
Journal, Blog, or Wiki Entry					.04	.844
Not Professional	56	47.9	13	50.0		
Professional	61	52.1	13	50.0		
Portfolio					.84	.358
Not Professional	70	59.8	13	50.0		
Professional	47	40.2	13	50.0		
Verbal Feedback					.23	.632
Not Professional	66	56.4	16	61.5		
Professional	51	43.6	10	38.5		
Completing Form or Checklist					1.32	.250
Not Occupational	55	47.0	9	34.6		
Occupational	62	53.0	17	65.4		
No Formal System					.13	.720
Not Occupational	114	97.4	25	96.2		
Occupational	3	2.6	1	3.8		

Table 18

**Frequencies and Percentages for Methodologies of Clinical Grading
Procedures by Degree Awarded Upon Completion**

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	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ²	*p*
Cumulatively for Key Clinical Experiences					.57	.451
Occupational	9	8.1	3	13.0		
Professional	102	91.9	20	87.0		
All Tasks and Procedures Daily					.77	.380
Occupational	100	90.1	21	84.0		
Professional	11	9.9	4	16.0		
Checklists With Assigned Point Values					.07	.798
Occupational	85	78.7	16	76.2		
Professional	23	21.3	5	23.8		
Formative Feedback					.46	.499
Occupational	2	1.8	0	.0		
Professional	109	98.2	25	100.0		
Pass/Fail Assessments					.71	.400
Occupational	24	22.2	7	30.4		
Professional	84	77.8	16	69.6		

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Table 19

**Frequencies and Percentages for Methodologies of Student Feedback and
Errors by Degree Awarded Upon Completion**

	Associate's Degree		Bachelor's Degree			
	n	%	n	%	χ^2	p
Formative Feedback With No Penalty on Senior Exam					.53	.467
Not Professional	89	76.1	18	69.2		
Professional	28	23.9	8	30.8		
Fundamental Error on Senior Exam					.40	.526
Occupational	42	44.7	9	37.5		
Professional	52	55.3	15	62.5		
Course Discussion of Errors on Senior Exam					4.23	.040
Occupational	84	78.5	14	58.3		
Professional	23	21.5	10	41.7		
Self-Reflective Writing After Senior Exam					.63	.429
Occupational	38	35.5	11	44.0		
Professional	69	64.5	14	56.0		
Team Discussion as Feedback on Senior Exam					.00	.959
Occupational	63	59.4	15	60.0		
Professional	43	40.6	10	40.0		
Verbal Questioning About Errors on Senior Exam					.43	.515
Occupational	2	1.9	1	4.0		
Professional	106	98.1	24	96.0		

						X^2	
Identifying Needed Remediation on Senior Exam						1.98	.160
Not Occupational	73	62.4	20	76.9			
Occupational	44	37.6	6	23.1			
Penalizing Daily/Patient Grade for Senior Exam						.18	.670
Not Occupational	90	76.9	21	80.8			
Occupational	27	23.1	5	19.2			
Point Deduction From Daily Grade for Senior Exam						4.20	.040
Not Occupational	55	47.0	18	69.2			
Occupational	62	53.0	8	30.8			
Providing Feedback on Instrumentation Techniques on Senior Exam						.36	.548
Not Professional	17	14.5	5	19.2			
Professional	100	85.5	21	80.8			
Most Weighted Senior Evaluation Strategy in Final Clinical Course						.61	.434
Occupational	16	20.3	3	13.0			
Professional	63	79.7	20	87.0			

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Table 20

Frequencies and Percentages for Methodologies of Didactic Evaluation Strategies: Exams/Projects/Presentations by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ^2	*p*
Case Study/Testlet					.24	.624
Occupational	1	1.0	0	.0		
Professional	104	99.0	25	100.0		
Essay Test					2.01	.157
Occupational	20	19.0	8	32.0		
Professional	85	81.0	17	68.0		
Independent Research Project					.48	.489
Occupational	8	7.7	3	12.0		
Professional	96	92.3	22	88.0		
Mock Exam					.13	.724
Occupational	85	81.0	21	84.0		
Professional	20	19.0	4	16.0		
Multiple Choice Test					3.72	.054
Occupational	100	97.1	22	88.0		
Professional	3	2.9	3	12.0		
Oral Exam					.34	.561
Occupational	53	50.5	11	44.0		
Professional	52	49.5	14	56.0		
Oral Presentation					.06	.803
Occupational	94	90.4	23	92.0		
Professional	10	9.6	2	8.0		
OSCE					.77	.380
Occupational	44	43.1	8	33.3		

Professional	58	56.9	16	66.7

Table 21

Frequencies and Percentages for Methodologies of Didactic Evaluation Strategies: Preparatory Exercises by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ^2	*p*
Competencies					.01	.906
Occupational	9	8.7	2	8.0		
Professional	94	91.3	23	92.0		
Logic Model					.36	.550
Occupational	45	43.3	12	50.0		
Professional	59	56.7	12	50.0		
Observation Checklists					.03	.859
Occupational	73	70.2	18	72.0		
Professional	31	29.8	7	28.0		
Portfolio					.40	.527
Occupational	40	38.8	8	32.0		
Professional	63	61.2	17	68.0		
Reflections					4.70	.030
Occupational	24	23.1	1	4.0		
Professional	80	76.9	24	96.0		
Rubrics					.74	.390
Occupational	3	2.9	0	.0		
Professional	101	97.1	25	100.0		
Self Evaluations					1.44	.230
Occupational	19	18.4	2	8.3		
Professional	84	81.6	22	91.7		
Standardized Patient					.23	.633
Occupational	44	42.7	12	48.0		
Professional	59	57.3	13	52.0		

Table 22

**Frequencies and Percentages for Methodologies of Critical Thinking
Development in Didactic Courses by Degree Awarded Upon Completion**

	Associate's Degree		Bachelor's Degree			
	n	%	n	%	χ^2	p
Reviewing and Analyzing Cases					.01	.915
Not Professional	19	16.2	4	15.4		
Professional	98	83.8	22	84.6		
Self-Reflection and Assessment					.40	.527
Not Professional	39	33.3	7	26.9		
Professional	78	66.7	19	73.1		
Individual or Team Learning Activities					.36	.548
Not Professional	19	16.2	3	11.5		
Professional	98	83.8	23	88.5		
Quizzes on Reading Assignments					.46	.500
Not Occupational	50	42.7	13	50.0		
Occupational	67	57.3	13	50.0		
Research Assignments					.01	.926
Not Professional	28	23.9	6	23.1		
Professional	89	76.1	20	76.9		
Student Development of Cases					.28	.597
Not Professional	74	63.2	15	57.7		
Professional	43	36.8	11	42.3		
Treatment Planning Exercises					.20	.658
Not Professional	31	26.5	8	30.8		
Professional	86	73.5	18	69.2		

Writing Assignments					2.44	.118
Not Professional	41	35.0	5	19.2		
Professional	76	65.0	21	80.8		

Table 23

Frequencies and Percentages for Methodologies of Self-Reflection in Didactic Courses by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ²	*p*
Journal, Blog/Wiki Entry, or Discussion Board Entry					.72	.397
Occupational	35	34.0	6	25.0		
Professional	68	66.0	18	75.0		
Student Form or Checklist					.77	.380
Occupational	75	74.3	15	65.2		
Professional	26	25.7	8	34.8		
Student Verbal Feedback					.86	.354
Occupational	15	14.7	5	22.7		
Professional	87	85.3	17	77.3		

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Table 24

Frequencies and Percentages for Methodologies of Didactic Course Teaching Strategies by Degree Awarded Upon Completion

	Associate's Degree		Bachelor's Degree			
	n	%	*n*	%	χ²	*p*
Case Studies					2.56	.109
Occupational	4	3.9	3	12.0		
Professional	99	96.1	22	88.0		
Clinical Application Exercises					.02	.882
Occupational	8	7.8	2	8.7		
Professional	95	92.2	21	91.3		
Dialogues					.03	.871
Occupational	15	14.7	4	16.0		
Professional	87	85.3	21	84.0		
Group Learning Activities					.12	.729
Occupational	3	2.9	1	4.3		
Professional	99	97.1	22	95.7		
PowerPoint Presentation					.12	.734
Occupational	93	90.3	22	88.0		
Professional	10	9.7	3	12.0		
Research Assignments					3.15	.076
Occupational	9	8.8	5	21.7		
Professional	93	91.2	18	78.3		
Socratic Questioning					.62	.430
Occupational	20	40.0	3	27.3		
Professional	30	60.0	8	72.7		
Writing Assignments					.01	.918
Occupational	5	4.9	1	4.3		
Professional	98	95.1	22	95.7		

Most Weighted Evaluation Strategy					.01	.911
Occupational	59	59.6	14	60.9		
Professional	40	40.4	9	39.1		

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