Punctuated Equilibrium: A Qualitative Case Study of the Influence of American Medical Education's Structure, Governance, and Function on Curriculum Reform

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Abstract

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The efficacy, relevance, and primary objective of medical education to develop student competencies necessary for the modern practice of medicine in an ever-evolving and advancing society has been questioned frequently throughout the past four decades. Over a hundred years ago, Abraham Flexner's report (1910), under the aegis of the Carnegie Foundation for the Advancement of Teaching, was commissioned by the American Medical Association (AMA) to examine existing medical education institutions in the United States and Canada. Flexner's findings exposed a number of deficiencies in instruction, facilities, and most notably in educational and student outcomes (the primary supposition for the AMA's charge for the report). Since the Flexner Report, the reoccurrence of medical education reform efforts and major themes suggest that U.S. medical schools are resistant to change.

This single case study deduces that medical education reform tends to be mainstream and

recurrent, and renewal measures aiming to modify instructional methods or traditional curriculum schematics evolve into modest additions, extensions, and/or revisions to the curriculum. Further, changes to the curriculum are legitimized as efforts toward reform in a "classic adaptive mode," which maintains the status quo while adding and/or integrating curriculum content to include more humanistic, current "hot" topics (e.g. the integration of medical ethics, cultural competency, leadership and interpersonal communication, etc.) to give the overall impression of wide-scale, progressive institutional change. Yet, what results is institutionalized innovation whereby the conception of change is embedded as pioneering new norms without eliciting any radical modifications to the mode, instructional methodology, or process of medical education.

This qualitative research study explores the historical, administrative, organizational, and political structures that impact fundamental education reform within American medical schools. How governance structures influence the process of reform policymaking within medical education, and the extent to which existing medical education structures and politics can be altered or adapted to create core, foundational change within U.S. medical schools. Major reform themes are identified in the qualitative case analysis to evaluate the extent to which a medical school can stray from customary, sanctioned models of medical education and time-honored, core education practices while maintaining institutional stability and status.

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DEDICATION

for my parents, Frank and Annette

Chapter 1. Introduction

Medical schools across the nation, as well as residency training programs and healthcare establishments, face growing scrutiny on the preparation of medical students to competently manage increasing amounts of complex cases and clinic work. Particularly, medical school curricula have been significantly scrutinized about what is being taught, the methods by which content is delivered, and its propensity to incite lifelong learning skills in order to advance with rapid advances in science, technology, and knowledge. Although medical education is inundated with reports and various studies of its "major evolution" since the historic Flexner Report in 1910, markedly in recent years, many of the standards and norms that dictate the structure and organization of medical education today is not inconsistent with the "2+2" Flexner approach: two years of basic science instruction followed by two years of applied clinical science. In spite of over a century of rapid advances and ever-increasing knowledge in foundational and clinical science, not withholding progressive teaching approaches, the formulation and organization of curriculum remains largely the same since the adoption of the Flexner Method. As such, U.S. medical schools and post-graduate programs have been increasingly scrutinized as having a rigid and critically dated system for training modern-day physicians (Abrahamson, 1989; Cook, Irby, Sullivan & Ludmerer, 2006; Irby, Cooke & O'Brien, 2010; Lindgren, 2013.

This is only compounded by the mounting need for physician expertise in healthcare policy, public health, analytics and informatics in medicine; and multidisciplinary care has challenged medical schools to produce graduates with knowledge and competencies outside the basic science, anatomy, and pathophysiology curriculum, including vital physical examination and note-taking skills fundamental to clinical experiences (Finnerty, Chauvin, Bonaminio, Andrews, Carroll & Pangaro, 2010). Who determines this? The Association of American

Medical Colleges (AAMC) arranges a set of learning expectations for medical doctors and other healthcare professionals per the Physician Competency Reference Set (PCRS), which organizes medical education competencies, learning objectives, program milestones, and entrustable professional activities into nine required knowledge and performance domains. The nine domains include: patient care, knowledge for practice, practice-based learning and improvement, interpersonal and interdisciplinary communication skills, professionalism, systems-based practice, interprofessional collaboration, personal and professional development, and social accountability (Eckstrand, Potter, Bayer & Englander, 2016). It should be stated, however, that the emphasis on professional development and social accountability demands that present-day medical students obtain knowledge beyond the traditional 2+2 Flexner approach. Yet, the importance of professional development and social accountability as well as other efforts centering on medical education reform encounter significant resource constraints not only in time, facilities, faculty, and funding, but in context: the complexity of the U.S. healthcare system (Eckstrand et al., 2016).

Given that the practice of medicine has fundamentally evolved throughout the twentieth century via the steady transmission of knowledge and discovery provided by travel and studies across the Atlantic, and most recently by information technology over the past hundred years, it would be ideal for medical education to adapt accordingly and almost analogous with great advances and discoveries made in basic science and clinical research. Particularly in the United States, where institutions of higher education are largely decentralized and autonomous enough to define entrance requirements and grant degrees to maintain both research and academic freedom, variations (in accordance with advanced knowledge and medical practices) abound. Yet, particularly throughout the past fifty years, notable medical educators and many iterations

of the General Professional Education of the Physician and College Preparation for Medicine Reports (more commonly referred to as the GPEP Reports) commissioned by the Association of American Medical Colleges, AAMC, have noted a recurrent pattern of disconnection between medical education (socialization) and the practice of medicine. This inconsistency is even more perplexing given that major governing bodies, such as the Liaison Committee on Medical Education (LCME) and the AAMC, have led decade-long initiatives and pledges to transform the "socialization" of medicine (Christakis, 1995; Council on Medical Education, 2012).

This reoccurring paradox has not been overlooked or discounted. As early as 1966, Harvard Medical School's Dean legendarily testified before the AAMC's Conference on the Continuation of Medical Education, stating: "In whatever way the education of the physician is viewed, it is remarkable how little change has taken place in the fundamental organization of medical education over the past half century ("Ebert Criticizes Medical Education," 1966; Knowles, 1977; Ebert, 1977; Ludmerer, 2005). More so, sentiments about the format and instruction of medical education by current and past medical students (both predecessors and professors alike) have been compellingly similar over the course of almost fifty-five years, 1957 to 2011 (Fox, 1957; Greger, 2000; Cody, 2011). Even Stephen Abrahamson (1989) lamented in his popular *Myths and Shibboleth in Medical Education* editorial that one of the "diseases of the curriculum" consisted of "curriculum hypertrophy" (p. 8). Whereby, advancing and continuing knowledge is countered by faculty resistance and disinclination to remove old material from the curriculum.

In addition to testimonies, editorials, and other personal accounts, appointed studies by preeminent authorities in medical education transpiring throughout the past five decades. Including multiple GPEP Reports, have redundantly acknowledged the process of curriculum

reform:

> A review of past efforts to modify medical education reveals that most of the problems identified [in the course of the *Physicians for the Twenty First Century* (1984) research] are not new. Institutions intermittently have **changed their curricula**, but unfortunately little progress has been made toward a fundamental reappraisal of how physicians are educated. Thus, we do not claim novelty in the discovery of deficiencies (Association of American Medical Colleges (AAMC) GPEP Reports, 1984; Greenlick, 1995, Wear & Castellani, 2000; Horton, 2010).

Further studies substantiate this premise and note expanding disconnections between medical education and the competencies needed for modern physicians to address growing population, regional, and individual health concerns (Harden, Sowden & Dunn, 1984; Todd, 1992; Finnocchio, Bailiff, Grant & Oneil, 1995; Boaden & Bligh, 1999; Langdale, Schaad, Wipf, Marshall, Vontver & Scott, 2003; Emanuel, 2006; Frenk, Chen, Bhutta, Cohen, Crisp, Evans & Zurayk, 2010). Deeper analysis reveals that over the course of the past sixty-five years, as medical knowledge increased exponentially with the onset of documented scientific and clinical research, and even more recently via the ease and accessibility of world-wide information technology that affords the mass and immediate sharing of knowledge, research, data, and discoveries; no revolutionary changes in medical education have occurred other than the adoption of problem-based learning (Donner & Bickley, 1993). Further, it is estimated that the progression of medical knowledge advanced by fifty years by the year 1950, from 1929, and doubled every seven years thereafter by 1980. Within the past six years, it is estimated that medical knowledge has doubled every three and a half years since 2010. It is further projected that by 2020, medical knowledge will double every quarter year (0.2), which equates to every seventy-three days (McGaghie, 2011). Accordingly, students who entered medical school in autumn quarter 2010 have already experienced roughly twenty-one times the advancement in medical knowledge since their matriculation. In other words, what was studied in years one

through three of their medical school experience, 2010-2013, is only six percent of what will be known by 2020.

Hence, knowledge continues to advance much faster than teachers can successfully deliver it and students can usefully integrate it into their medical school experience. Medical education's tendency to add and integrate curriculum content, reallocate course and study time, supplement existing curricula with alternative instructional methodologies, and/or utilize additional assessment tools to "renew/reinvigorate/reform" medical education curriculum as a means to develop more competent twenty-first century physicians is not only greatly limited by time, but has not significantly impacted traditional educational practices that comprise the core of medical education. Even more, given the inability to keep up with all the advancements, such medical education reform efforts appear as more of an organizational coping strategy – simply making symbolic (peripheral) curriculum changes, rather than on developing methods to implement sustainable medical education improvements that impact core educational norms and conventions no longer in harmony with the progressive, evidence-based field of medicine. Fundamental medical education reform has never been more paramount given that the current focus of existing curriculum renewal processes appear to inhibit the ability to keep pace with advancing knowledge that impacts patients', as well as society's, livelihoods and quality of life.

British mathematician, logician, and philosopher Alfred North Whitehead (1929) bemoaned that civilization must ceaselessly invest in the upkeep of educational systems in order to evolve with the needs of society. Whitehead lamented that a lack of investment would certainly curtail the primary byproducts of education (discovery and societal improvements), for universal and fixed educational systems could not keep pace with growing societal needs and progress. Hence, civilization would be penalized by stagnant discoveries or plagued with the

propagation of unfounded knowledge. This could not be more relevant within a field and research discipline reliant upon scientific discovery and advances in knowledge.

How, amidst the cast of recurrent charges for medical education reform spanning decades, has the format and delivery of medical school curriculum remained largely intact and resistant to significant advances in knowledge, science, and technology? A logical approach to addressing this stagnation involves tracing the development of modern medical education in the United States.

1.1 History

Medical education in the United States once consisted of bedside instruction and apprenticeship paradigms propelled by primeval medical theory, which perpetuated monistic pathology and celestial therapeutic practices consisting of blood-letting and vomit-inducing herbs to remedy illness due to “imbalance” well into the seventeenth century (O’Malley, 1968). Imbalance defined as the excess or lack of bodily fluids in the bloodstream, a popular and prevalent notion widely cast about illness originating in 470-370 BC.

However, the rise of laboratory science endorsing scientific methods of discovery and the emergence of clinical specializations influenced the U.S. to abandon ancient, celestial practices of medicine and adopt an amalgamated model of both the British and German medical school prototypes by the nineteenth century. During this period, British medical schools were hospital-oriented and German schools were university-oriented. Whereas, medical institutions throughout the U.S. were disjointed, proprietary, and largely apprentice-based (Cox, Irby, Cooke, Sullivan & Ludmerer, 2006). In fact, by the early nineteenth century, medical education varied greatly across the U.S. frontier. American medical schools were primarily proprietary organizations, the majority private for-profit organizations, with yielding entrance requirements, inadequate facilities, and divergent curricula. American physicians, particularly those trained in the practice

of medicine at premier institutions overseas such as Oxford University and Ludwig University of Freiburg in Breisgau, Germany, recognized the need to improve medical education in the U.S. due to its lack of unified instructional practices, poor professional conduct, inadequate entrance standards, markedly pedestrian scientific breakthroughs, and production of incompetent surgeons in comparison to Europe (Rothstein, 1987). Following the gathering of a national medical convention in 1845, the American Medical Association (AMA) was established in 1847 to improve public health, promote the advancement of scientific discovery, and establish guidelines for medical education ("AMA History," 2017). The inception of the AMA initiated the critical appraisal of medical education and practitioners in the U.S. By 1860, the AMA's Committee on Education recommended universal standards for medical education institutions and the curriculum, including higher entrance requirements, lengthening of terms to nine months spanning over four years (an increase from four terms over two years), the adoption of a graded curriculum, and a major reform of medical licensing laws to require a final exam separate from the school attended; *i.e.*, state-based board examinations (Fishbein, 1947; Beck, 2004; McAlister & Claydon, 2012.

The scarcity of medical school reform by 1904 prompted the AMA to form a Council on Medical Education, the CME. The CME's main purpose was to improve the quality of medical practitioners by reforming American medical education. The CME's first charter meeting produced two initiatives: 1) minimum education requirements for admission, and 2) a four-year curriculum requisite comprised of two years of anatomy and physiology instruction followed by another two years of clinical exposure in teaching hospitals (Davis, 1933; Johnson & Green, 2010). To endorse its reform agenda, following five years of lackadaisical adoption of the new CME standards by U.S. medical schools, the CME commissioned the help of Henry Pritchett, a

tenacious benefactor for medical education reform and President of the Carnegie Foundation for the Advancement of Teaching, to survey the American medical education system (Enarson & Burg, 1992; Cox, Irby, Cooke, Sullivan & Ludmerer, 2006). Pritchett recommended Abraham Flexner, PhD, given his specialization and pedigree in higher education outside the discipline of medicine. Pritchett felt Flexner's extensive experience in education and lack of familiarity with medical education structures made him both qualified and well-suited to impart an objective assessment, free from implicit bias, of U.S. and Canadian medical institutions (Hiatt & Stockton, 2003). Flexner surveyed all 155 schools throughout the U.S. and Canada, and observed vast differences in each school's admission and graduation requirements, curriculum, and modes of student assessment.

Flexner's report was published in 1910 became practically synonymous with the dismal state of medical education and flood of incompetent, poorly trained medical practitioners in the U.S. Flexner's unabashed portrayal and stanch perspective of medical education establishments throughout the U.S. provided the CME with compelling evidence to initiate education reform (Beck, 2004). Excerpts of Flexner's passages describe the majority of U.S. medical schools as: "a disgrace to the State whose laws permit its existence […] indescribably foul […] the plague of the nation" ("Carnegie," 1910, pp. 207-214). Yet, Flexner did afford commendation to a few schools that served as a "model for medical education" (p. 45). The schools with honorable mention as "bright spots," exemplars of preeminent medical education practices and facilities, amid the vast "darkness cast by the dreary state of [American] medical education" were Case Western Reserve (Cleveland, Ohio), John Hopkins (Baltimore, Maryland), the University of Michigan, and Wake Forest in Winston-Salem, North Carolina (p. 280). Flexner made five main recommendations for the reformation of all U.S. medical schools based upon his immersion and

perception of forefront educational practices at the aforementioned universities, particularly the John Hopkins School of Medicine. These recommendations endorsed the closing of 120 of the 155 medical schools, the adoption of a rigorous science curriculum (referred to as the "Flexner prescription:" two years of basic science followed by two years of clinical experience, endorsing the recommendation of the CME in 1904), the utilization of state and private funds rather than a proprietary financing system, and strict national and state licensing examinations (Hiatt & Stockton, 2003).

Ten years following the circulation and almost universal acceptance of the Flexner Report, what was once a largely frontier-oriented and two-year apprenticeship model of education had transitioned to encompass the best educational practices of England, France, and Germany (Barzansky & Gevitz, 1992). This amalgamation consisted of extensive academic and clinical instruction in classrooms with well-equipped laboratories and university-affiliated teaching hospitals. Today, over a century later, this general structure of medical education and instruction has endured and produced specialists with a scientific basis of knowledge, but engrossed in an ever-evolving, complex, and technologically-advanced environment. General practices of a physician have now advanced to include further exposure to a variety of patient ailments and diagnoses, and extends training in clinical specialties, provided by three to five years of post-graduate study (residency).

After World War II, circa 1950, medical education began to slightly stray from Flexner's two by two approach (two years of basic science followed by two years of clerkships) to an integrated model of instruction exhibited by Case Western Reserve University School of Medicine. The integrated method applied four main concepts: 1) assimilation of the basic science disciplines, referred to as "horizontal integration," often presented in a block format; 2) the

combination of early clinical experiences (preceptorships/"shadowing" experiences) and the incorporation of science in future clinical work, "vertical integration" (Bradley & Mattick, 2008); 3) the full process of human development from conception, birth, and death as an all-inclusive, biological model of study; and 4) the comprehensive clinical care of patients. Since 1950, the majority of medical schools have adopted this educational model and included behavioral science as a required clerkship experience; *i.e.,* psychiatry (Funkenstein, 1978; Brauer & Ferguson, 2015). Even though these minor alterations in educational methodology have been residual, Flexner's fundamental prescription has remained intact. The primary level of medical education is still comprised of basic science instruction in graduate classrooms with threads of anatomy and dissection labs. Even though medical school programs have gradually afforded students with opportunities to take electives focusing on humanism, wellness, and complementary or alternative medicine courses that meet graduation requirements, students are still expected to master knowledge in anatomy, biochemistry, epidemiology, histology, microbiology, pathology, pharmacology, physiology, and the associated sub-disciplines. Until recently, due to information becoming ubiquitous, this phase of instruction involves an extensive amount of memorization and didactics. This initial two-year phase of basic science instruction was followed by clerkship experiences where students transitioned from the classroom to clinical encounters in medical subspecialties, such as: emergency medicine, family medicine, internal medicine, obstetrics and gynecology, neurology, and surgery.

The spersistence of Flexner's two by two educational formula may be attributed to a greater focus on the ideology behind the traditional methods of medical education rather than on practice, referred to as the common contest between teaching the science or practicing the art of medicine – whether medicine is "art based on science" or simply an art (Panda, 2006). It is a

belief system similar to that of the art or science of teaching where faculty attempt to balance the development of instructional tactics based on sound science and evidence-based research along with integrating humanism as an applied science (Marzano, 2007). The ideology behind medicine's status as a science or an art is prominent and well-disputed amongst faculty, particularly when students transition from basic science studies into the clinical realm of medicine (clerkships) and direct patient care.

As early as 1978, Dr. Edmund Pellegrino[i] described the current state of medical education as a primarily "scientific endeavor to be taught in the university by fulltime academicians who are specialists" with students selected mainly for their scientific and quantitative competence (p. 863). Pellegrino further described instruction as inculcating scientific method as the prime strategy for problem solving. "The physician is to be trained as an applied **biological** scientist if he is to be kept abreast of the continuous flow of biomedical information" (Pellegrino, 1978, p. 864). The instructional focus on biological science in contrast to clinical experiences persists today, and Flexner's 2+2 prescription is somewhat concealed, but remains intact.

Additionally, since 1920, admissions' requirements for medical school have steadily increased to include more extensive biology plus improved basic behavioral science comprehension, using more student-centered education modalities. Students enter with greater

[i] Edmund Pellegrino, MD, was a Professor Emeritus of Medicine and Medical Ethics at the Kennedy Institute of Ethic at Georgetown University and Founding Director of the Center for Clinical Bioethics. Throughout his professional career, Dr. Pellegrino researched and authored a number of journals pertaining to educational philosophy and medical humanities, in addition to serving as Chairman of the President's Council on Bioethics in Washington, D.C., a John Carroll Professor of Medicine and Medical Ethics, the Executive Director of the Kennedy Institute of Ethics, and Director for the Center for the Advanced Study of Ethics at Georgetown University. His work, much of which was conducted during his tenure at Georgetown University, is so influential and significant in the area of heath care that the Center for Clinical Bioethics at the University also bears his name.

biological science knowledge and zealous to engage in active learning and problem-based learning formats (Gwee, 2017). Yet, despite the endorsement of social and behavioral sciences (humanities), the incorporation of theme and thread content, and commendation of interactive learning and problem-based learning programs, the Liaison Committee on Medical Education (the LCME) maintain standards that uphold the established Flexner model of medical education[ii] (LCME, 2017).

Today, public health and patient needs have been elevated as major principles in the study of medicine. Medicine has shifted to incorporate and place greater importance on addressing an institution's respective community health needs, and not solely on alleviating common illnesses and developing treatments for disease. Hence, medical education has expanded to include the study of epidemiology, population health, and the humanities, but these disciplines have most often taken an auxiliary role within medical educations curricula and designated as electives that supplement the foundational, deep-seated basic science courses (Cox, Irby, Cooke, Sullivan & Ludmerer, 2006; Batistatou, Doulis, Tiniakos, Anogiannaki & Charalabopoulos, 2010). Even more, themes (a main topic interwoven into a single course) and threads (topics linked and revisited in multi-semester or multi-quarter courses) have been supplemented into many a program's curriculum, but nevertheless tend to be intermingled within the first year and a-half or first two years of basic science instruction. Theme and thread content has taken more of a complementary and purposeful function in medical education curricula to ensure that modern aspects of medicine are incorporated in clinical clerkship phases as well; such as information literacy, biomedical informatics, and analysis of comprehensive data

[ii] The Liaison Committee on Medical Education, LCME, is the main accreditation and governing body recognized by the U.S. Department of Education for medical education programs leading to the medical doctor (M.D.) degree, and sponsored by the Association of American Medical Colleges (AAMC) and the American Medical Association.

collection sets afforded by technological advances and utilized readily for medical decision-making and evidence-based medicine (Wylie & Holt, 2010). Although there is a growing emphasis on incorporating evidence-based practices in educational reform to substantiate curriculum renewal efforts, in other words referring to the best evidence available (most readily accessed through information technology) with the intention of making the most beneficial medical decisions for the care of similarly-situated patients, evidence-based medicine has not been fully accepted nor well-adopted or integrated into students' foundational basic science and clinical experiences (Gill, Dowell, Neal, Smith, Heywood & Wilson, 1996; Silvermann, 1998; Masic, Miokovic & Muhamedagic, 2008). Therefore, what is considered to be improvements and/or the result of reformation efforts and the modernization of medical education in correlation with the times is little more than ornamental.

Even with adaptations to the conventional model of medical education, the experiences of medical students remain substantively unchanged over the hundred years following the publication of the Flexner Report. The experience constellation persists throughout periods of meticulous evaluation and reconsideration of instructional practice, and concurrently in times where knowledge requirements steadily increase to meet swelling admission criterion. Yet again, the predominant model of medical education perseveres.

An exhaustive review of various peer-reviewed journals and field studies concerning the purpose of U.S. medical education reform efforts[iii] spanning from the mission of academic medical centers to clinical research establishments, including special conference proceedings and

[iii] Please see Appendix E for a detailed listing of reports, literature, and corresponding reform initiatives researched and consulted against a variety of sources adapted from "An Overview of Reform Initiatives in Medical Education" in the *Journal of the American Medical Association, 268*(2), pp. 1141.

meetings commissioned by the major governing organization (the LCME), reveal intermingled propositions for this stagnation discussed in Chapter 2.

1.2 The Development and Impact of the Impervious Model of U.S. Medical Education

Flexner's Report (1910) initiated a radical reform of the American medical education system and the recommendations contained therein still serve as the foundation for scientifically-centered teaching institutions throughout the United States and Canada (Carnegie Foundation, pp. 20-27). The researcher, Abraham Flexner, advocated for a model of medical education that mirrored the advanced instructional practices most affluent in Germany. A country with a renowned medical education program due to monumental discoveries, e.g. the scientific method, germ theory, and surgical sterilization; and exceptional production of graduates, the likes of Herman Friedberg, Robert Koch, and Erich Lexer (Bonner, 1963; Langone, 2003). From 1865 to 1918, German medical schools' premier reputation for forefront laboratory science and medical study lured approximately fifteen thousand American medical students over the Atlantic Ocean (Sabin, 1934). As such, it has been debated as to whether Flexner's analysis of medical education and unabashed accounts of America's destitute system and inadequate quality of instruction and teaching facilities were drawn in direct comparison to German methods (Ludmerer, 1985). Nevertheless, the publishing and wide dissemination of the Flexner Report caused the major reformation and development of an American model of medical education by 1920, which has been relatively impervious to reform ever since. Many have denoted Flexner's recommendations as the universal adoption of the time's leading "Hopkins Model" of medical education, originally devised by the founding medical professors of John Hopkins University and referred to collectively in literature as the "Four Horseman" (Cooke, Irby, Sullivan & Ludmerer, 2006). Although the structure and practice of medical education under the "Hopkins Model" has been

scrutinized by the twentieth century's greatest medical educators and practitioners, it has remained relatively unchanged since the wake of Flexner's report. Therein lies both the problem and question that has plagued medical education reform attempts since the dawn of transportation and increasing ease to transmit, access, and share knowledge. As time progresses and knowledge expands, perhaps developments and advancements in technology do not require the reorganization of medical education curriculum or the structure and delivery of content. The model of medical education is certainly not broken. However, the need to produce lifelong learners in an environment riddled with innovation and progress that has certainly evolved the field and practice of medicine is compulsory. But, is it feasible given the historical precedent of medical education and the structure of governance and oversight provided by the LCME that has strongly influenced the legitimization and congruence of educational structures, customs, and procedures across medical schools nationwide.

In accordance with the Hopkins Model, the Flexner Report (1910) endorsed a four-year program as the paradigm for progressive medical education, equally split into two years of rigorous biomedical and basic science study followed by two years of mentored and closely monitored clinical experiences remains largely in-part today with slight fluctuations in the length of basic science study and earlier clinical exposure (Ludmerer, 1985; Langone, 2003). Hence, curricula became arduous, homogenous, and subject to rapid advances in biomedical science. The basis of medical education focused on the practice of medicine encompassing a comprehensive overview of treatments, diagnosis, as well as the systematic understanding of the biological basis of disease. The clinical phase incorporated consenting patients in teaching hospitals as a means to expose students to multiple ailments, complex cases, and witness to outcomes of extended treatments. This was feasible, for prior to World War II expenses

associated with in-patient care was low and, as such, patients stayed an average of one to two-weeks in the hospital (Starr, 1982; Randolph, 2009).

By 1924, the primary purpose of medical school was to receive a science-based education (Duffy, 1993). Even though the Flexner Report had advised schools against this, encouraging a balance between rigorous basic science study and arduous clinical training while incorporating elements of humanism and the promotion of health, the emphasis on basic biomedical science ensued. Another untended consequence of the Report, resulting from Flexner's recommendation to close institutions with poor educational qualities, such as inadequate faculty-to-student ratios and dismal teaching facilities, was the closing of 122 schools – the majority of which were primarily homeopathic and cared for large underserved minorities (Blumberg & Davidson, 2009). Contrary to Flexner's intention, the proliferation of the Hopkins model of medical education fostered the development of an exceedingly demanding, specialized, elitist, and traditional system of medical education that hasn't changed dramatically since 1920.

With the onset of World War II and thereafter, America's domestic interests focused on industrialization, prompting scientific discovery, medicine, and the number of warfront doctors. The B-12 and V-12 military training programs, which originated in the early 1940s to supplement the war with physicians and commissioned officers, freed physicians and officers from their service commitments following the end of the war (Spaeth, 1985). These programs, accompanied with the Servicemen's Readjustment Act of 1944, the GI Bill, created a wave of homeland medical practitioners and specialists. Even more so, the federal government made unparalleled pledges in support of medical research, health promotion, and disease prevention via the establishment of the National Science Foundation, National Institutes of Health, and the Centers for Disease Control and Prevention (Bush, 1945; Parascandola, 1996, NIH, 2016).

Medical schools vied for the funding these organizations expended and erected infrastructures to obtain funding and train principal research investigators (PIs) to sustain and secure future funds.

Thereafter, in the 1960s through 1970s, greater financial support for clinical care was brought about by the establishment of federally-sponsored healthcare policies and financing (Medicare and Medicaid), as well as employer-sponsored health insurance programs. The creation of federal healthcare programs and the rise of private insurance companies supplemented the operational expenses affiliated with the clinical aspect of medical education (Healthcare.gov, 2015). It also sparked concerns pertaining to the teaching objectives and purposes of medical schools. Research by Ernest Boyer (1995), commissioned by the Carnegie Foundation for the Advancement of Teaching, substantiates these concerns. Boyer's work deduced that universities undervalued teaching as the top priority in relation to other measures that prioritized funding for research, facility improvements, and/or promotion above instruction. Further, Diana Beattie's (2000) examination of universities' academic reward systems and classifications for promotion underestimated the value of teaching and professional development, and undermined efforts centered on the reformation of teaching practices as well as the alignment of shared goals, missions, and purposes (pp. 874-875).

Studies throughout the 1980s and early 1990s persistently acknowledged academic medicine's dulling obligation to preserve teaching's precedence as a top institutional priority. The Louis Harry survey of 1989, which sampled over 1,300 hundred medical school deans, basic scientists, research clinicians, and specialized clinical scientists, unearthed unrivaled concurrence that essential changes were needed in the American medical education system; including, the vital need to develop a mechanism by which to incentivize, identify, and increase faculty merit for exhibiting excellence in teaching (Marston, 1992). Nevertheless, the survey failed to summon

or report the types of changes or thoughts these major stakeholders had about the core structure of medical education.

Prior to the turn of the twenty-first century, a substantial number of leading medical education associations and academics attempted to address concerns about teaching's falling preeminence as medical school's main purpose and objective, and appraised the current model of professional medical education. These studies offered reform recommendations based on the current state of medical education, as well as included suggestions published in previous reports spanning decades. Particularly and most prominently, the Association of American Medical Colleges (AAMC) organized a board of renowned medical educators and nationally-recognized researchers to examine medical education and propose improvements and modifications to the system. The General Professional Education of Physicians and College Preparation for Medicine (GPEP) panel noted the main deficiency in schools' clerkship phases, consisting of required clinical specialty rotations in emergency medicine, family medicine, internal medicine, obstetrics and gynecology, neurology, pediatrics, psychology, and surgery that occur in students' third and fourth years of medical school, were inadequately managed and monitored. Most notably, the GPEP reported that clinical experiences did not sufficiently provide students with longitudinal patient care experiences, necessary to cultivate deeper understandings of disease processes and related treatment interventions, or proper evaluations and timely performance feedback (GPEP Report, 1984).

Although the GPEP Report (1984) is recognized as the ultimate keystone for the critical evaluation and assessment of core medical education curriculum, many of the Report's major recommendations have yet to be universally incorporated into medical programs. A plethora of succeeding research and reports, especially those contracted by the AAMC, have acknowledge

this lack of progress. Notably, in compilations of studies and accounts of medical education reforms and proposed policies, commentaries have repeatedly express blatant concern about the field's overall negligence in assessing and attending to deep-seated deficiencies in their educational programs and overall student preparation prior to professional practice (Jencks, Cuerdon & Burwen, 2000; Milbank, 2000; AAMC, 2014; Ellaway, Albright, Smothers, Cameron & Willet, 2014). That said, despite the fact that several medical schools have implemented significant reforms efforts predominantly in the basic science phase (first two years) of the curriculum like that of the University of Washington School of Medicine in 2015, many others have reported it exceedingly problematic:

> […] difficult, if not impossible, to make fundamental changes in the last two years of the curriculum [clinical education phase] … The lack of innovation in the last two years is almost certainly due to the fact that many members of the clinical faculty do not believe that changes are necessary or needed. […] The attitude that change is not needed in the design and organization of the last two years of the curriculum ignores certain current realities. It is contradicted by reports indicating that, at the time of graduation, medical students too often lack fundamental clinical skills that they should have acquired during their clinical education (Whitcomb, 2001 as cited in Greenberg, 2003).

This excerpt expands further to describe the deep-rooted disinclination and literal aversion to reforming required specialty rotations and electives imbedded in institutions' clinical cultures, belief interests, and departments – possibly propelled by economics and the fear of being the lone institution descending from recognized, prevailing methods of eminent medical education.

This is even more judiciously analyzed in case studies conducted throughout the 1990s and early 2000s of ten medical schools selected for their insistent curriculum reform efforts.[iv]

[iv] From 1995 to 2000, extensive case studies of medical education curricular reform initiatives and implementation processes were analyzed at: Boston University School of Medicine (Boston, MA); Case Western Reserve University School of Medicine (Cleveland, OH); Cornell University Medical College (Ithaca, NY); John Hopkins University School of Medicine (Baltimore, Maryland); McMaster University Medical School (Ontario, Canada); Northwestern University

Evidence confirmed that the educational structures and methodologies applied at these institutions were unsatisfactory and inattentive to essential competencies required for modern physicians to proficiently practice twenty-first century medicine (Kellogg Foundation, 2001; Ludmerer, 2005). Unremarkably, three main deficiencies were noted throughout these studies. Foremost, medical schools have been bequeathed with obsolete equipment and laboratories, and a basic science faculty unable to continually teach at the front-line of biomedical science due its ever-evolving and advancing progress. Secondly, competencies and professional entrustment levels of medical students, chiefly in the clinical phase of the curriculum, are fragmented and, consequently, do not adequately prepare contemporary physicians for the management or treatment of chronic illnesses – much of which will likely dominate physicians' medical practices and overall patient care. Thirdly, the purpose of teaching hospitals/academic medical centers and their affiliated medical schools differ, and the quality of teaching and instruction is successive to financial obligations, liabilities, and interests (Alpert, 1995; AHRQ, 2003; Ludmerer, 2005). Accordingly, all ten of the institutional structures studied neglected to develop strong teaching-centered merit systems or offer education-based incentives to core faculty members, and the influx of market-oriented forces continually reprioritized the instructional objectives and interests of their respective clinical departments (Kellogg Foundation, 2001).

The Flexner Report instigated the creation of university-based, American medical schools. Over time, this has given rise to academic medical centers (AMCs) that house other allied health programs, e.g. physician assistant, nursing and public health programs, which are anchored to medical schools and the clinical specialties/departments by which they operate.

Feinberg School of Medicine (Chicago, IL); the University of Michigan Health System (Ann Arbor, MI); Temple University School of Medicine (Philadelphia, PA); the University of Colorado School of Medicine (Denver); and, the University of North Carolina at Chapel Hill School of Medicine.

Under the structure of an AMC, the professional programs direct learning over the first to three years of the curriculum. In medical school, the first two years are standardized. Basic science faculty, often in rotations based upon their area of expertise, teach the rudiments of basic bioscience through lectures or active learning formats. This is intended to provide medical students with the fundamentals crucial in becoming a scientific and clinical thinker, and advancing to the clinical training phase. Clinical education is directed and supervised by specialized clinical faculty within the university's own or associated AMC/teaching hospital, as well as affiliated clinics scattered throughout the community. It is important to note that a student's clinical phase of training is largely taught and monitored by faculty with little to no formal schooling as an educator. This is compensated by years and years of clinical experience as medical practitioners, residents, and/or in fellowships. Hence, the clinical stage is distinctly grounded upon the circulation and inculcation of traditions, ideals, habits, and ethics gathered from each clinical faculty member's previous educational experiences, patient encounters, ad lib approach to practicing medicine, and/or from the respective specialty's professional society. Particularly, professional societies and organizations are highly influential in creating educational policy and regulating practices for specialized practice and certifications. Board certifications verify that a high level of training in a clinical specialty has been completed, and measure competency by performance on standardized examinations in specialized domains. Certifications do not evaluate a physician's clinical performance or their patients' outcomes, but board certification standards do strongly influence what clinical departments elect to teach and require in terms of training and exposure to patient encounters (Grosch, 2006; Darling-Hammond, 2004).

Additional findings, resulting from research conducted institutionally and commissioned

by the AAMC and the Lancet Health Commissions, indicate that the initial basic science component of medical education curriculum does not affix or effectively transition students into the clinical phase.[v] For, the majority of students surveyed were unable to ascertain or recognize the relevance of basic science knowledge presented by faculty in the first two years of medical school, and its relationship and application in the subsequent phase of clinical training (Ludmerer, 2005; AAMC, 2014). This research not only suggests the existence of basic medical science subdivisions that resemble and present similar, if not the same, content delivered in undergraduate science courses, but mainly underscores the pronounced divide between medical schools' basic science departments and clinical clerkships. Even more, clinical training is subject to heavy consumer demand. Teaching hospitals, ambulatory, and community clinics treat a high volume of patients daily. Since emphasis is placed on the immediate care of waiting patients, as well as the management and discharge of as many patients as possible for fiscal and occupancy purposes (maintain low facility overhead and tender maximum billing), teaching is circumstantial and not privy to evidence-based practices (Muthaura, Khamis, Ahmed & Hussain, 2015). Time is a major currency, and developing evidence-based behavior and teaching its application in medical practice entails careful case selection, the formulation of advanced clinical questions, and research of the best evidence and resources available, including the practitioner's expertise. Evidence-based, clinical decision-making for a novice involves painstaking contemplation of various treatment options and approaches to patient care, all of which is compounded by the patient's traits, beliefs, and preferences (Chambless & Hollon, 1998; Thomas & Pring, 2004).

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[v] The Lancet Health Commissions are convened and assembled by authorities in all specialized clinical specialties and sciences. The Lancet Commissions are tasked with assembling forefront medical scientists and practitioners to conduct advanced, original research throughout the globe. The Commissions are derived from *The Lancet*, which is considered the oldest and most well-known, weekly peer-reviewed general medical journal in the world.

Further, the failure of the twentieth century's federally-endorsed healthcare plan, the Health System Reform Act of 1993, resulted in severe government cuts in healthcare spending. The Reform Act mandated employers to provide all employees with health insurance by means of competitive and heavily regulated managed care associations. (Health maintenance organizations (HMOs), independent practice associations (IPAs), and preferred provider organizations, (PPOs) are considered managed care organizations.) With the federal government freed from providing substantial healthcare funding, managed care organizations and insurance companies bore the brunt of healthcare financing. Efforts to minimize and justify healthcare expenditures lead managed care organizations and insurance companies to impose strict cost control and productivity mandates (Hoffman, 2003; Taylor, 2014) on their clientele, which included academic medical centers.

Government cuts in healthcare spending had already imposed financial constraints on academic medical centers. This amassed with the new marketplace forces (managed care organizations) significantly impacted academic medical centers' teaching objectives, for greater demand was placed on fee-based clinical procedures and system-based measures to gauge levels of physician productivity and efficiency. Academic medical centers responded by investing in neoteric information systems (data banks) as an attempt to analyze and develop more efficient processes to reduce administrative practices and free clinical faculty's time for more profit-generating activities. This has only been aggregated with the onset of the Affordable Healthcare Act (2010), which has placed even greater attention on academic medical centers to remodel and develop larger, more efficient practice plans that accommodate universal healthcare objectives, generate revenue, and maximize physicians' time (Taylor & Clinchy, 2012). These conditions have remained relatively unchanged, just more engrained and accepted as a part of the day-to-

day practice of modern medicine. Hence, limited institutional resources, decreased government funding, increased pressure on faculty to produce revenue, and little to no incentives for teaching have placed even greater constraints on academic medical centers and the overall health profession's mission to modernize and reform medical education.

The impact of managed care associations in providing quality healthcare services have raised questions as to whether modern-day physicians are being competently trained to address present-day issues, such as the safe, effective, and efficient care of patients in a resource-restricted and profit-motivated environment. Yet more, the fundamental and underlying question remains: **why hasn't the education and training of physicians adapted to meet the ever-evolving needs of society?** Ultimately, to adequately scrutinize this analysis of reform given the context, UWSOM's curriculum renewal process, it is important to acknowledge the purpose, problems, and ultimate outcome of an American medical education: professional qualification (impart adequate knowledge, skill, tenet, and mindset necessary for medical practice as a primary physician, generalist, or specialist); competence in practice (acquire the ability to perform basic and complex procedures, as well as employ keen interpersonal/inter-professional communication skills and practice advanced clinical reasoning); and aptitude for lifelong learning (ensure physicians remain proficient in the professional practice of medicine throughout their careers). This is compounded by external forces that vie for economic resources and are influenced by both internal and external stakeholders' competing interests.

Chapter 2: A Review of the Literature in Context

Medical education is a national myriad of medical schools, teaching hospitals, academic medical centers, affiliated community clinics, and accompanying faculty, professional staff, students, and resident physicians. These academic entities and professionals perform multilayered functions – the delivery of quality health and patient care, as well as instruction and research. The multifaceted enterprise of academic medicine is marginally demarcated from the healthcare system based upon the communal responsibility to provide future generations of physicians, scientists, and biomedical researchers with proficient education and professional training to foster advances in the alleviation of pain and suffering, injury rehabilitation, and the prevention of disease, illness, and untimely death (Miles, 2004). Overall, the healthcare system aims to capture the outcomes and byproducts of academic medicine/medical education; *e.g.,* advancing clinical knowledge, research, and physician competency, to ensure quality patient care and delivery to the public, preferably the insured public. Academic medical centers (AMCs), such as the University of Washington School of Medicine (UWSOM), vary slightly from traditional healthcare systems with established medical schools, affiliated teaching hospitals, and community-based clinics in organizational structure; for, AMCs are university-based and integrate academic missions along with clinical and research purposes (AMCs, 2015). Hence, AMCs host and are comprised of an amalgamation of education, research, and patient care objectives. AMCs share a commitment to the delivery of quality patient and healthcare along with objectives to provide professional education and opportunities to students as a means to propel innovation, discovery, continuous quality improvement, instruction, and scholarship.

AMCs mark a significant evolution in the structure of medical education since the establishment of the very first medical school, the University of Pennsylvania School of

Medicine in 1765, and even more so when it comes to the new era of mapping educational program objectives, expected competencies, research activities, and the multifaceted healthcare system (Fee, 2015). Medical education reform efforts have initiated changes in the multidimensional domains of education, research, and patient care, yet even with these steady changes, stagnation in the format and structure of education remain largely the same. A thorough review of the literature reveal seven major propositions for this lack of progress.

2.1 Stagnation

Foremost, medicine is fundamentally viewed as a scholastic endeavor. Although the study of medicine is comprised of many scientific disciplines, the educational emphasis remains on knowledge retention, recall, and performance. The apprenticeship training model furtively endures and accordingly, medical schools mainly focus reform efforts on instruction and pedagogy; for example, on adopting teaching methods or evidence-based, "best" practices that influence students' acquisition of new knowledge and reinforce competency sets. Consequently, the recital and performance of time-honored professional practices and behaviors supersede objectives to enhance students' generation and communication of new ideas, as well as the development of lifelong learning capacities. Medical education curricula relies on the postulation that competency is constructed upon a strong foundation of basic science knowledge and fundamental acts and behaviors expected of a physician.

Secondly, when major concerns regarding the efficacy of medical education structures and training have been raised, the curriculum is presumed to be the only apparatus that directs and governs instruction, as well as the acquisition of knowledge, proficiency, values, and attitudes. Thus, reform efforts and continuous quality improvement measures only target to change or modify the existing curriculum. Yet, medical schools' curricula are more often

representations of the institutions' educational ideologies, *i.e.* a preeminence on scientific knowledge, primary care, clinical practice; and/or on education methodology – a discipline by discipline (block) or problem-based curriculum. From this perspective, the social organization of medical school is minimized, but extremely significant in terms of initiating and sustaining effective patterns for lasting change. An overwhelming amount of evidence gathered from studies of educational reform, instructional innovation, and organizational management cite social values, measured by shared institutional visions and rhetorical statements affirming goals, as levying and implementing viable organizational or curricular changes (Bloom, 1973; Burnes, 2011; Levine, 1980; Fullan, 2002; Awbrey, 2005; Branson, 2008; Kotter & Schlesinger, 2008; Smollan & Sayers. 2009; Coutts, 2016)

Third, reform efforts assume that all faculty are onboard in spite of their role, rank, and relation in the institution (Hecker & Violato, 2009). There are three distinct roles of medical educators: basic scientists, research clinicians, and specialized clinical scientists. An unforeseen outcome of Flexner's Report (1910) was the continued division of faculty and clinical departments. Decentralization remains an organizational characteristic of medical education due to the multi-faceted, specialized, and complex nature of training and requisite patient encounters as required by the LCME. Flexner expected modern medical schools to consolidate their laboratories, clinical branches, and teaching hospital in order to provide students with a comprehensive educational experience, as well as unify values among faculty and the university as a whole. This would ease the facilitation of faculty development and the sharing of teaching ideals, methods, principles, and ethics. However, the structural division of medical schools are far too large and necessary for the fulfillment of educational requirements per the LCME (Carnegie, 1910; Johnson & Green, 2010).

Fourth, given medical schools tend to be sizeable and decentralized organizations, they typically operate similar to industrial bureaucracies. For, the model of medical education is systematically organized around specific, codified criteria for admittance, performance as an indication of competency measured through milestones, and promotion to subsequent grade-levels. Weight is placed on the impersonal attainment and replication of technical and procedural standards – much like that of an assembly line where a series of workers perform in succession and produce identical matter using the same methodology as a means to progressively assemble or approach tasks. The advantage of this approach relies in minimizing the risk of descent from customary practices, student insubordination, as well as limiting isolation or alienation of minority or marginalized students. During times of reform, efforts that threaten this instructional and assessment constructs tend to be invalidated and overwhelmed by pressure not to change. Actions to alter the U.S.'s traditional medical education structure and processes are thwarted by what is perceived to be the globe's most preeminent training model, as well as the most consistent architype in providing equal educational experiences for all students and the reliable production of competent physicians (Ludmerer, 1999; Beck, 2004; Norman, Van der Vleuten & Newble, 2012). This notion is corroborated by Hans Weiler's (1983) theory of compensatory legitimization, which contends that the government procures legitimacy via public goods and services; *e.g.,* public education, medical insurance programs, *etc*. To be deemed an educated country, the government must provide and maintain a formidable educational prototype that sets, meets, or exceeds domestic and/or international standards. Consequently, it is in the best interest of a government and its municipality to set consistent, measurable standards to ensure the quality and condition of its educational systems. For this reason, the State and governing bodies become large stakeholders in reform processes to maintain the perceived legitimacy of its educational

structures.

Fifth, the bureaucratic and decentralized structure of medical education conflicts with its ideology. Medical schools are gradually expanding and, as such, demand increasing resources that exceed revenue collected via tuition, subsidies, grants, endowments, or state and federal dollars. Therefore, schools must generate income to sustain day-to-day operations. This is amassed through support of major research and/or technology initiatives accompanied with hefty funding, and specialized care that advances profitable medical care billing (American College of Physicians, 2009). This state of affairs subordinates the aims of medical education reform policies to the financial requisites necessitated by the institution and its operating structure.

What is more important? An average, ordinary medical education program or an expanding organizational structure that ensures the institution's sustainment, vitality, and livelihood. Hence, policy developed to alter or modify the structure of medical education by external parties is of little interest or perceived benefit to clinical department heads or laboratory scientists who produce sizable revenue or obtain bountiful research grants for the university (Hafferty & Franks, 1994; Densen, 2011). This pattern of bureaucracy and industrialization of medical education, coupled with decreased state and federal funding, has altered administrative policies and implemented cost-control strategies. This has swayed both clinical specialties and departments chairs' priorities and perspectives of medical education reform proposals. Most notably and often cited policy trends in medical education depict the superseding and succession of community-focused reform goals to those objectives with the yield to reap greater financial benefit or additional resources. This has been attributed with what is perceived as the "dehumanization" of medical care and why some calls for educational reform have been initiated (Haque & Waytz, 2012).

Sixth, educational policy and standards are determined nationally by a constituency-

based governing body. William Rothstein, a leading historian of American medicine, stresses the impact of the voluntary organization of professional physicians, the American Medical Association (AMA), on academic medicine. Rothstein (1987) emphasizes the role and clout of the AMA in deciding national healthcare and government policies, and through its subsidy (the LCME), perpetuates and establishes medical education trends. Even if the AMA's influence is indirectly entrusted by the authority of the LCME, the reality is that educational reform must be condoned and match the AMA's philosophy, expected knowledge and competency standards, and biomedical initiatives. Once more, it appears that educational reform efforts aimed to develop more humanistic and competent, modern physicians are secondary to the interests of authoritative external groups (Kassebaum, Cutler & Eaglen, 1997; Burke & Butler, 2012).

Seventh, overarching problems have emerged vis-à-vis medical education reform efforts and futile attempts to adapt curriculum to meet the ever-advancing and ever-evolving state of modern medicine. It appears that organizational and governing interests, whether by authority to influence decision-making processes or via control of the distribution and/or availability of resources, may serve to encourage or impede educational reform endeavors. Lone approaches to modify curriculum in order to manifest new and innovative educational methods without attention or efforts directed toward changing the organization structure of medical schools have consistently proven to be ineffective – suggesting that reform efforts must be coordinated along with actions to reform institutional structures. Truly a daunting enough undertaking to synchronize without added deliberations or contentions concerning overhead expenses, faculty buy-in, and auxiliary operational costs inflicted by supplemental time needed by professional staff and faculty to evaluate and reform the curriculum.

Nevertheless, a main question still endures: why has the format and delivery of medical school curriculum remained largely intact and resistant to change despite significant advances in

knowledge and technology spanning over one hundred years? It is touted that medical education is subject to those with access to scarce pecuniary resources and thus, determinant upon their own interests. Hence, the challenge to change U.S. medical schools may be greater than its structural impediments. The claims presented herein suggest that three divisions among medical educators' interests (between the basic scientists, research clinicians and specialized clinical scientists) separate, compete, and outweigh medical education reform policies. For instance, research capitalist organizations and specialized medical centers have teamed together to form commanding lobbying parties that craft and preserve government entities committed to research and/or support research enterprises. The most prominent example is the National Institute of Health, NIH. NIH was designed to foster cooperation and alliance between government and scientific inquiry via extensive funding (NIH, 2016).

2.2 Declining Pecuniary Resources

The reliance on state and federal support for medical education institutions has decreased substantially since the 1960s, but it has increased sizably for academic exploration and specialized medicine (Rothstein, 1987; Densen, 2011). Additionally, this reliance mirrors the for-profit sector, for companies in the medical industry have forged government partnerships to support the generation of new information, as well as fund research in biotechnology and outpatient care (Pettijohn, 2013). Although ambivalence exists between laboratory scientists and teaching physicians regarding these sorts of contracts, the fiscal benefits afforded to each party and their respective institutions have perpetuated for-profit organizations and university pacts. While these partnerships enhance institutional research purposes and provide funding for facility improvements, they have not altered conventional medical education structures or educational practices. Research conducted by the AMA, and recurrently cited in the AAMC's GPEP Reports

(1984; 1985; 1991; 1995; 2004; 2013; 2016), identify the internal schisms and varying interests concerning the goals of medical school reform: "Despite frequent assertions that the general professional education of medical students is the basic mission of medical schools, it often occupies last place in competition for faculty time and attention" (The GPEP Report, 1984, p. 15). Further,

> [Specialization] has let to aggregates of semiautonomous units that […] often become further and further separated from the educational philosophy of the parent discipline. The [funding and assets are] emphasized at the expense of the broad education needed by graduates […] to provide general medical care (Hannigan & Eldredge as cited in Wood, 2014, pp. 43-44).

The American medical education system is not exclusive in this respect. This trend is transnational only with different and rivaling interest groups. Therefore, I suspect that the answer to why the format and delivery of medical school curriculum has remained largely intact and resistant to change lies in the institutional structure (processes, content, and context) of medical education. The integration of basic science and clinical specialties for the purpose of medical education entails the amalgamation of multi-purposed, organizational and department structures – all of which have diverse and often competing interests. In order to propel and protect their distinct interests, which are associated with compulsory operational requirements for their respective division's sustainment and prosperity, basic science and clinical domains subordinate the shared mission and goals of the medical education institution for that of their own department's livelihood. This phenomenon is referred to in organizational theory as "social dominance," which explains the evolution of hegemonic groups and creation of hierarchies within organizations, and herein implies that medical schools' curriculum renewal goals and missions are somewhat window dressing (Pratto, Sidanius & Levin, 2006). Social dominance is a branch of social network theory that examines organizational networks and structures that

impede an organization's efforts to evolve or adapt to changes, and offers a deeper perspective into the structure of relationships that impact organizational goals, values, and behaviors. Social network theory provides insight into an organization's communication impediments or obstructive operational habits that impact efficiency, attitudes, and/or opportunities for reform; especially with consideration to perceived organizational hierarchy (Daly & Finnigan, 2010). Under the application of social network analysis, medical schools encompass the capacity for great structural reform given its social capital. Employees, in this case faculty and professional staff, are all highly educated and derive from a wealth of diverse and specialized professional experiences. Even more, faculty and staff are intrinsically motivated by shared commitments to the public's welfare and speculatively, to their organization's mission and/or purpose. Taking all of this into consideration, medical education reform efforts stall given the division between basic scientists', research clinicians', and specialized clinical scientists' varied interests and vie for shared, limited resources – all of which gives rise to the implicit perception of organizational hierarchy among the groups.

Yet, medical schools strive to preserve the integrity (legitimacy) of its conventional educational structure while faculty and professional staff expend efforts to maintain and expand their respective departments. By all accounts, revising the curriculum is the most common semblance for addressing rational calls for change in medical education. However, it appears that distinct interests associated with medical educator roles (consisting of basic scientists, research clinicians, and specialized clinical scientists) may overshadow and foil institutional reform processes. Hence, underlying preferences of researchers and clinical specialists overwhelm education renewal efforts; perhaps inadvertently due to reform efforts and aims to incorporate advances in modern medical science with time-honored medical education practices. To some

degree, medical education reform has become a routine activity prior to periodic assessments of medical schools and their curriculum, which occurs in up to eight-year cycles per LCME sanctions. Certainly, in this respect, medical schools need medical students, but perhaps more so to justify (legitimize) the institutional apparatus and its existence; rather than for purposes of elevating instruction and promoting greater scientific discovery.

Nonetheless, the populace needs competent physicians, but the objectives of medical educators and medical education structures do not reach or impact core didactic customs that could most effectively revolutionize the training of modern physicians to meet the contemporary needs of the population.

2.3 Purpose for the Research

All of this is nothing new. The Carnegie Foundation for the Advancement of Teaching, the body responsible for inciting the need for medical education reform as well as financing Abraham Flexner's research of medical education resulting in The Flexner Report (1910), has continually noted "ossified curricular structures" in addition to antiquated assessment methods that obstruct institutions and stakeholders in major curriculum reform efforts in bidecadel reports (Cooke et al., 2006). Even a reexamination of The Flexner Report, revisited one hundred years later (2010), found that although "modernized" curriculum models exist, consisting of advanced medical equipment and instruction, the structure of medical education hasn't often differed significantly from Flexner's 2+2 prototype of 1910. In fact, the report suggests that the abundance of "integrated" curriculum models is merely a deliberate guise and "buzzword" to give the appearance of a more conventional structure and delivery of competency-based medical education programs (Page & Baranchuk, 2010). The appearance and popularity of "integrated curricula" have significantly increased since its inception at McMaster University in Canada, and

in one of the first U.S. iterations at Hofstra at Nothwell University in New York and Harvard University (Neufeld, Woodward & MacLeod, 1989). Integrated curriculum models of medical education purport linkages between basic science disciplines that improve students' retention, and complement the development of clinical skills and proficiencies through interdisciplinary instruction, as well as thematic and synergistic teaching methods (Brauer & Ferguson, 2015).

Much of the rise in medical education renewal efforts focused on integrating the curriculum is attributed to the Liaison Committee on Medical Education's (LCME) updated accreditation standards that mandate "coherent and coordinated" and "integrated with and across the academic periods of study" (LCME, 2009, 2013). More so, since 2004 proposals for the enactment of integrated curricula across the nation have been endorsed by the AAMC (AAMC, 2001; AFMC, 2012; Ambrose, Bridges, DiPietro, Lovett & Norman, 2010). Even more noteworthy, the AAMC and LCME rarely provide detailed guidelines, and/or suggestions on how to institutionally develop, implement, and assess standards other than general criteria due to considerable variability of institutions and context. Institutional leaders and their stakeholders therefore rely on general definitions and applications of standards to formulate curricular innovations. For example, application of proposed "integrated curriculum" models include the integration of "theme" and "thread" content (*e.g.*, ethics, primary and palliative care experiences, patient safety, *etc.*) throughout all four years of the curriculum, along with the amalgamation of basic science and physician shadowing rotations, substantially increasing clinical exposure within the first two years of medical school (Schwartz, Loten & Miller, 1999; Ogur, Hirsh, Krupat, Bor, 2007; Yu, Xu, Lu, Luo & Wan, 2009; Drybye, Starr, Thompson & Lindor, 2011). This is coupled by a full spectrum of curricular changes with various implementation tactics, guiding philosophies, and disjointed definitions of integration among administrators, curriculum

coordinators, faculty, clinicians, and students (Klement, Paulsen, & Wineski, 2011; Radwany, Stovsky, Frate, Dieter, Friebert, Palmisano & Sanders, 2011; Brunger & Duke, 2012). Collectively, the lack of clarity stemming from modernized educational standards endorsed by the LCME and literature published of other institutions' practices, applications, and approaches to curriculum renewal processes only complicate the process of curricular reform and adaptation to meet the demands of extensive and ever-increasing advancements in science and clinical information.

This complexity is only compounded by medical research's predisposition to produce substantial revenue and economic growth, which casts a shadow over educational efforts. The efforts aim to change traditional curriculum structures or practices necessary for core instructional improvement. It is surprising, considering medical education's capacity to generate profits for federal and state public health research mandates, that there has been a lack of research comparing medical institutions to large revenue-producing business enterprises; since from an industry and commerce perspective, they are. Medical schools are substantial economic contenders in the "big" business of training and illness prevention. Furthermore, medical institutions generate revenue, and have sizable payrolls and market share, *i.e.,* students and patients (customers). The importance of identifying and examining organizational structures and dynamics is abundantly stressed within business literature, especially pertaining to an organization's need to build an adaptable and cross-functional infrastructure that maximizes human capacity and marketing for longevity in a global economy (Densen, 2011). Yet, a lack of formal research and evaluation studies exist examining similar human capacity and structural components in large, complex medical education institutions. With a wealth of research and literature highlighting the vital importance of adaptable organizational frameworks on traditional

decision-making hierarchies within the business community, there has yet to be a trail of directed studies exploring the "big" business of medical education and curriculum renewal efforts or in the development of innovative medical education programs. An abundance of research in higher education stresses the importance of curriculum revitalization, yet minimal studies exist examining how institutional structures influence the process of reform policymaking in medical education, and to what extent existing medical education structures and politics can be altered or adapted to create core, foundational change within medical schools (Densen, 2011; Ivankova & Stick, 2007; Davis & White, 2002; Tierney, 1988)?

Therefore, an overlooked aspect of medical education research exists within the realm of existing practices and medical schools' organizational structures, which are widely shared among institutions nationwide and governed by the LCME accrediting body. Given the voids in literature pertaining to academic medicine and the process of reform policymaking within medical education, and in spite of variations made to curriculum design and integrated instructional measures, there is evidence that large scale modifications in the content and format of medical curricula has not resulted in sustainable medical education reform, or substantial quantifiable improvements is student outcomes. Hence, the purpose of this research is to gain greater insight and a deeper understanding of the historical, administrative, organizational, and/or political structures that limit fundamental reform within American medical schools? How do these structures influence the process of reform policymaking within medical education? To what extent can existing medical education structures and politics be altered or adapted to create core, foundational change within medical schools?

2.4 Background

In 2010, the University of Washington School of Medicine (UWSOM) embarked on a curriculum renewal process initiated by new national standards culminating from two decades of changing paradigms relating to the rise of information technology, advances in medical knowledge, and its implementation in day-to-day medical practices. This was notable given UWSOM's establishment as a "pre-eminent [regional] academic medical center" and as a "national leader in biomedical research" drawing international attention, and the institution's distinction for providing exceptional education and training opportunities for future physicians and scientists (UW Medicine, 2016). Executive leaders, Dr. Paul G. Ramsey, Dean of UWSOM and CEO of UW Medicine, and the Vice Dean of Academic Affairs, Dr. Ellen Cosgrove, maintained that curriculum renewal efforts were necessary to maintain UWSOM's educational mission promoting institutional and continuous improvement measures that alight staff, faculty, and all other regional stakeholders' (regional partners and affiliated clinical sites throughout the Pacific Northwest: Washington, Wyoming, Alaska, Montana, and Idaho, jointly referred to as the WWAMI program) interests towards the enhancement and sustainment of an advancing and nationally ranked, top-tier academic medical center providing outstanding patient care and research for an advancing healthcare community.

UWSOM's organizational objectives aim for the continual modernization and advancement of medical education via a scholastic environment filled with students, professors, and researchers that share progressive attitudes and embrace ingenuity, technology, and innovation. The institution consistently maintains its national ranking by the U.S. News & World Report as a top-tiered medical school, and steadily receives an ample proportion of research funding from the National Institute of Health, NIH, currently amounting to almost half a billion dollars per year (U.S. News Report, 2016; Blue Ridge Institute, 2015). UWSOM's national

prominence aided measures to welcome and inaugurate the process of curriculum renewal, eventually implemented during the 2015-2016 academic year. Although a number of adult learning theories were cited, the utmost relevance of the Oversight Committee, the main governing committee for the many (14) subcommittees formed to attend to and drive many components of the curriculum renewal efforts, was the approaches and proposed curriculum models of other similarly-situated medical education institutions – of which, heavily relied upon and cited the need for modern, "integrated" approaches to medical education to keep pace with ever-increasing advances in basic and clinical science. In an executive report submitted to the Joint Labor, Health, and Socials Services Committee by September of 2014, UWSOM legitimized its commendation for a curriculum renewal process over the five-year evaluative period:

> "75% of medical schools in the United States are in the process of or have already transitioned to integrated curriculum models…instruction plans will impact core [educational] practices that will enable [students] to develop the same level of skills as those [other medical students] graduating from the nation's most prestigious universities" (WWAMI Executive Report, 2014).

The report furthered substantiated its recommendation by noting the importance of training medical students in an institution ranked as a top medical school in the U.S. for over twenty years and receiving several billion dollars in state and federal research funding, especially from the National Institute of Health, NIH (ibid, 7). This is significant, for the UWSOM is consistently ranked on a national level and steadily receives one of the largest proportions of research funding from the NIH annually (U.S. News Report, 2016; Blue Ridge Institute, 2015). The Committee unanimously agreed that curriculum renewal efforts were justified in order to maintain UWSOM's status as a top-tier medical school.

It is also important to note the emphasis and focus of national attention on curriculum renewal efforts advocating "integrated curriculum" models. Updates in the LCME's

accreditation standards in 2012 placed requisites on content that "is coordinated and integrated within and across academic periods of study" (LCME, 2013, p. 14). Correspondingly, its umbrella organization, the Association of American Medical Colleges (AAMC), sanctioned integrated curriculum measures to meet modern-day accreditation paradigms and produce "evidence of purposeful curriculum design which demonstrates horizontal and vertical integration and articulation [of content] with subsequent stages of training" to maintain licensure status as a medical doctorate degree granting program (AAMC, 2012, P. 8). Although the reverence of an "integrated curriculum" boasted great benefits for students' knowledge retention and overall training, the development and definition of "integration" lacked consistency and clarity nationwide. UWSOM defined its new integrated curriculum as a synchronous, interdisciplinary delivery of knowledge from basic to applied sciences over the course of the four-year medical program (WWAMI Curriculum, 2015). Previously published literature pertaining to integrated medical school curricula did not resemble UWSOM's definition. Even more ominous was the dearth of literature on the longitudinal effectiveness of integrated curriculum models (Lowitt, 2002; David & Harden, 2003; Brunger & Duke, 2012; Brauer & Ferguson, 2015). A basic literature keyword search of 'integrated curriculum' revealed no controlled studies, but nostalgic commentary, reviews, and opinions collected via group feedback sessions and surveys of students in an integrated setting. Again, an "integrated" setting carrying different connotations among varying groups.

Given the push for integration as a symbol of medical schools evolving and adapting to meet technological advances, as well as the ever-increasing demands of the healthcare system, well-intentioned faculty (course directors) find themselves reformulating instructional plans by adding new material and/or implementing alternative teaching and learning methods without completely eradicating prior practices or old material. Determining what content should be

reviewed and taught is yet another challenge – let alone what knowledge should **not** be imparted (Watson, Suter, Romrell, Harman, Rooks & Neims, 1998). This suggests that despite the push for and implementation of "renewed" medical education curricula, changes do not reach core instructional practices. Thus, peripheral changes to the curriculum maintain the status quo and give the overall impression of wide-scale, progressive institutional changes. What results can be perceived as institutionalized innovation whereby the conception of change is embedded as pioneering new norms without eliciting radical modifications to core, instructional methodology, or the process of medical education.

In this context, the UWSOM served as an outstanding opportunity to conduct an exploratory case study on the reformation of curriculum processes in an established, multifaceted system, and examine the development and implementation of curriculum renewal efforts in-pace with incessant advances in the progressive, ever-evolving field of medicine.

In spite of variations made to curriculum design and integrated instructional measures, there is evidence that large scale modifications in the content and format of medical curricula has not resulted in sustainable medical education reform. Taking into consideration all of these components, the following three research questions were posed: What are the historical, administrative, organizational, and/or political structures that limit fundamental reform within American medical schools? How do these structures influence the process of reform policymaking within medical education? To what extent can existing medical education structures and politics be altered or adapted to create core, foundational change within medical schools?

UWSOM's efforts to reform educational practices and integrate content across basic science (organ-based systems) and clinical experiences presented an opportunity to evaluate a medical school's curriculum undergoing renewal, prior to and during its implementation.

UWSOM's case was that the analysis would be beneficial for the preservation of the School's organizational mission founded on the advancement and commitment to excellence in biomedical education, research, and healthcare, and national status as a top-tier medical school (UW Medicine, 2011; 2016). For, there has yet to be a comprehensive analysis of curriculum renewal processes for a single institution over the course of time spanning major educational initiatives, national legislation, and groundbreaking research (*i.e.*, Higher Education Act of 1965, Jean Piaget's *The Science of Education* and research of the learning cycle, the Equal Educational Opportunities Act of 1974, James Banks' work focusing on *Multicultural Education: Transformative Knowledge and Action*, reinstatements of the No Child Left Behind Act (2001), and the amended and reauthorized Higher Education Act, 2005). Other than the compilation of accreditation records and reports composed for the LCME, the nationally recognized governing body for medical education programs in the United States and Canada, to assess standards of educational quality, there has yet to be a documented analysis of changes made in a single school's medical education curriculum longitudinally to gauge the degree of change (to the core), and the fidelity of reforms over time. This is significant, for such an examination has the potential to evaluate an individual educational program's effectiveness in meeting prescribed national standards, which promote institutional self-evaluation, and provide invaluable data that may be utilized for the identification and efficient implementation of continuous quality improvement measures that afford competitive advantages, identify areas needing improvement, highlight best practices, reduce costs, as well as provide greater influence in adapting educational models to meet demands in a rapidly changing and growing healthcare environment.

Chapter 3: Research and Methodology

Medical education research aims to expand the understanding of learning processes and competencies by examining student cohorts, relationships between teachers (preceptors) and learners (apprentices), as well as instructional environments. Recent medical education research suggests that major challenges exist with the development and implementation of innovative teaching practices, and the integration of creative planning strategies that facilitate instructional reform and curriculum renewal measures. Yet, few studies address the influence of national governance structures and internal, organizational frameworks on curriculum renewal efforts aimed to keep pace with advances in medicine that effect the competency and training of twenty-first century physicians.

Purpose

The purpose of this study is to examine the organizational factors of an accredited U.S. medical school, subject to the Liaison Committee on Medical Education's (LCME's) legislation, and federal and state funding, during the development and implementation of a curriculum renewal process. The University of Washington, School of Medicine's (UWSOM) regional WWAMI Program serves as the study's unit of analysis from 2012 to 2015. UWSOM's organizational framework afforded opportunities to thoroughly investigate the institutional attributes of a top-tier, accredited U.S. medical school, and examine the existence and nonexistence of salient themes/patterns in the organization's structure, curricula approaches, and educational objectives during a curriculum renewal period. The following research questions were posed: what are the historical, administrative, organizational, and/or political structures that limit fundamental reform within American medical schools? How do these structures influence the process of reform policymaking within medical education? To what extent can existing medical education structures and politics be altered or adapted to create core, foundational change within medical

schools?

Research Design/Approach/Methods

A qualitative case study suited the research's purpose, design, and analysis. The use of an intrinsic case study methodology suited the study's exploratory approach and rationale – to acquire a breadth of understanding pertaining to the influence of an organization's structure, governance, and function on medical education curriculum. Methods associated with case study analysis offered the means to navigate the intertwined, multifaceted redevelopment of a medical school's curriculum. Record/document/narrative analyses affirmed with observations of day-to-day operations and informal, semi-structured interviews provided for the revelation and emergence of major themes, the triangulation of initial findings, as well as deeper insight and exploration of decision-making processes and organizational dynamics.

3.1 Synthesis of Literature Substantiating the Research

Throughout the past four decades the efficacy, relevance, and often cited primary objective of medical education to develop student competencies necessary for the modern practice of medicine in an ever-evolving and advancing society have been frequently questioned (Ebert & Ginzberg, 1988; Abrahamson, 1989; Mennin & Kaufman, 1989; Cantor, Cohen, Barker, Shuster & Reynolds, 1991; Christakis, 1995; Petersen, 1999; Sargent, 2001; Davis & White, 2002; Lawley, Saxton & Johns, 2005; Halperin, Perman & Wilson, 2010; Densen, 2011; Mehta, Hull, Young & Stoller, 2013; Drake, 2014; Quintero, 2014; Heritage Foundation, 2014; See Appendix A). Over a hundred years ago, Abraham Flexner's report (1910), under the aegis of the Carnegie Foundation for the Advancement of Teaching, was commissioned by the American Medical Association (AMA) to examine existing medical education institutions in the United States and Canada. Flexner's findings exposed deficiencies in instruction, educational

facilities and, most notably, in educational and student outcomes (the primary supposition for the AMA's charge for the report).

Since the Flexner Report, content analysis of nineteen other major reports concerning undergraduate medical education reform in the United States, as well as initial document analysis of two esteemed medical schools, reveal five consistent, major objectives for the progression and continuous demand for medical education reform:

1. Yield a physician workforce committed to improving public healthcare and its delivery system;
2. Better serve the public interest;
3. Address physician workforce and community/public health needs;
4. Manage burgeoning, ever-advancing medical knowledge and research; and
5. Increase the focus and emphasis on broad and holistic perspectives of patient problems/ailments (Christakis, 1995; Kirstein, 2015; See Appendix H).

The reoccurrence of these themes throughout the past one hundred and six years, and especially during periods of curriculum renewal development and planning, is nothing new. In spite of extensive modifications to medical school curricula emphasizing professionalism and humanism in the care of patients to better serve respective communities and address public health needs (this includes the supplementation of ethic courses, focus on interpersonal communication, and development of lifelong learning skills to meet the unrelenting progression of medical knowledge), the core structure, format, and delivery of medical education has not substantially changed since the aftermath of the Flexner Report (1910). In fact, evidence suggests that in lieu of large scale reform efforts and a wealth of research findings affirming concerns to modernize medical education, medical schools have not and do not literally change (Abrahamson, 1989; Christakis, 1995; Patel, 1999; Guilbert, 2001; Fish & Coles, 2005; McGaghie, Issenberg, Cohen, Barsuk, & Wayne, 2011; Mehta, Hull, Young & Stoller, 2013). This phenomenon in the field of medical education has been referred to by Samuel W. Bloom (1988), an esteemed Harvard education sociologist, and expanded upon via the research of Noel

Boaden and John Bligh (1999), as "reform by modest curriculum extension" (as cited in Spencer & Jordan, 2001). Bloom (1988) described medical education reform as cyclical, and both Boaden's and Bligh's (1999) research affirms this claim as well as the four recurrent appeals for reform. Collectively, Bloom's, Boaden's and Bligh's studies find that changes made in medical schools' curricula are legitimatized as efforts towards reform, but in a "classic adaptive mode" (as cited in Spencer & Jordan, 2001). "Classic adaptive mode" maintains the status quo while adding and/or integrating curriculum content to include more humanistic topics; *e.g.* medical ethics, cultural competency, leadership and interpersonal communication, *etc.*, to give the overall impression of wide-scale, progressive institutional change. Therefore, what results is institutionalized innovation whereby the conception of change is embedded as pioneering new norms without eliciting radical modifications to the function, instructional methodology, or process of medical education (Bloom, 1988; Boaden & Bligh, 1999; Spencer & Jordan, 2001).

Another possible proposition for the reoccurrence of the four main themes compelling reform efforts may be attributed to medical curriculum renewals that target and focus efforts mainly on the lessons and academic content taught throughout the program of study. Much of Trevor John Gibbs', Steven Durning's, and Cees Van Der Vleuten's (2011) grounded theories on medical education research cite disillusionment with continually focusing curriculum renewal efforts on instructional reinvention of the curriculum wheel without making changing to the enduring Flexnerian "2+2" education model – two years of basic science study followed by two years of clinical practice. Gibb states, "we need to make the wheel adaptable to a dynamically changing and real-world environment. We need to design programs that are not dependent on stability or tradition, but are sustainable by adapting to change" (p. 183). So, why has the focus to develop new integrated courses and curricula superseded the development of flexible and adaptable curriculum structures and/or formats that accommodate the ever-progressive field of

medicine?

How is it that given the surmounting and ever-progressive advances in scientific knowledge, that it often seems the traditional structure, format, and delivery of medical education has not adapted well? There have been modern, peripheral changes to curriculum that advocate for the addition of courses centered around humanism, integration of content among disciplines, shorter basic science instruction, and increases in clinical encounters, but the core Flexnerian model of medical education has remained largely intact.

Hence, despite variations made to curriculum design and integrated instructional measures, there is evidence that large scale modifications in the content and format of medical curricula has not resulted in sustainable medical education reform. Therefore, to what extent can a medical school meet the need to restructure and transform an antiquated model of education while maintaining enough institutional stability and institutional status to deviate from core, time-honored medical education curriculum formats and customs? For, outdated medical education practices and customs appear resilient to continual institutional changes in the content, format, and delivery of curricula.

3.2 Rationale for the Research Methodology

My research question seeks to examine a phenomenon (reform), within a bounded system – an accredited U.S. medical school subject to LCME legislation and federal funding. The unit of analysis is UWSOM's organizational framework; more specifically, UWSOM's internal organization of relative ranks, roles, positions, management, and duties on decision-making processes and implementation of curriculum renewal efforts. To acquire a holistic understanding of UWSOM and examine efforts towards curriculum renewal aims (modifications, variations, the evolution, reformation, adaptability, development, and progression – all elements of change), a case study methodology offers the means to investigate a present-day phenomenon (state of the

organization, management and decision-making processes) in context and over time, as well as analyze group behaviors and identify causal mechanisms or transitional patterns within a single case (Stake, 1995; Yin, 2003). Especially given UWSOM's distinct regional program attribute, as the largest regional medical education program in the country responsible for the education and training of a fixed number of medical students for five states: Washington, Wyoming, Alaska, Montana and Idaho (referred to collectively as the WWAMI medical education program), a holistic case study approach facilitates the exploration into UWSOM's change process over a longitudinal period to examine changes or adaptations of the organization and management to facilitate curriculum renewal processes in an esteemed educational program from multiple vantage points.

Hence, a case study methodology provides the means to conduct an exploratory study and apply both descriptive and diachronic comparative analyses of UWSOM's organizational infrastructure prior to and following the intervention – curriculum renewal efforts to develop and incorporate updated LCME (national governing body) standards and implement a revamped curriculum with innovative instructional and assessment plans. A case analysis affords opportunities to thoroughly investigate the existence or nonexistence of structural differences, and compare what the data reveals over a given period of time. That is, the impact of the organizational infrastructure on the timeline and implementation of curriculum renewal initiatives during the 2014-2015 academic term. Further, a qualitative case study suits the research design and analysis, since I seek to acquire a breadth of understanding pertaining to the influence of an organization's infrastructure (the governance, structure and function) on medical education curriculum using document analysis and observation as the major data collections methods, and informal interviews with UWSOM stakeholders to afford deeper insight and for clarification (member checks).

3.3 Sampling Strategy

Upon commencing this study, four eminent medical schools were considered for this case study: Vanderbilt University School of Medicine, Johns Hopkins University School of Medicine, Duke University School of Medicine, and UWSOM. To determine which prominent school to study, I formulated a criterion sampling strategy by means of predetermining criteria of significance: national ranking/reputation, federal funding for research, and accreditation status (Patton, 2003). I utilized primary data collected by national agencies (the LCME, the National Board of Medical Examiners, NBME, the Federation of State Medical Board, FSMB, and the Accreditation Council for Graduate Medical Education, ACGME) that either establish and/or influence core medical education competencies as well as the quality of research initiatives at accredited and licensed U.S. medical schools. Although controversial, secondary data was gathered from the *U.S. News and World Report*'s education rankings, which quantify school standings using a formula that measures indicators of academic quality and takes into consideration the Carnegie Classification System developed by the Carnegie Foundation for the Advancement of Teaching (Shulman, 2000). Even though the *U.S News*' data collection and analysis processes are heavily criticized for the selection of "poor" perceived indicators and the overall annual study's vigor and validity, the agency and its reports are publically recognized by prospective students and their parents as a comprehensive valuation of a schools' academic quality, faculty size, financial resources, research/institutional capacities, and expected student outcomes (Strauss, 2017). These rankings offer a publically accessible and measurable account of factors that reflect the structure, size, and availability of existing and incoming resources of medical schools in comparison to each other.

The *U.S. News*' rankings were averaged with National Institutes of Health's (NIH) total research funds awarded by institution for the year 2015 (Blue Ridge Institute, 2015). To examine

the relationship between institutions' national standings and total NIH funding, I averaged the overall number of applications and grant money NIH awarded per institution, and weighed the total amount of funding provided by the FSMB Foundation in 2015. Since NIH funding applications judge a research project's feasibility by the investigators' (faculty) credentials, time specifications, and the capacities of institutions' facilities and lab spaces, many smaller schools opt to apply for FSMB funding due to inadequate facility space, insufficient lab equipment, and/or other building limitations and faculty time constraints; for substantial NIH research grants place a greater demand on human and institutional resources (FSMB Annual Report, 2015). Hence, the addition of total FSMB funding distributions offers weight to smaller institutions comparable in educational quality according to LCME accreditation statuses, but are not justly reflected by *U.S. News*' rankings due to their inability to apply and receive substantial NIH[vi] funding grants.

The *U.S. News*' rankings, NIH funding, and FSMB data sets were compared to LCME accreditation ratings. LCME ratings are applied to all 130 medical schools within the U.S. to indicate accreditation in adherence to core educational competencies. LCME ratings for this study were classified as: 'accredited' (1) or 'non-compliance'/'transitional' (0), and demarked (See Appendix B). Without consideration of these significant criterions, the sampling basis for this qualitative study would have appears ambiguous or convenient.

The results derived from the *U.S. News* rankings, total NIH funding, FSBM distributions, and LCME statuses in 2015 were combined to produce a composite score that provided an overall ranking of U.S. medical schools, which were stratified into top, mid- (most represented), and lower-tiered institutions. The aggregation of the ranking, accreditation status, and funding

[vi] Funding provided by the FSMB's Foundation for the year 2015 accounts for smaller schools' reliance on FSMB endowments rather than on NIH funding.

results placed UWSOM as the top medical institution by a significant margin. Congruent with the Patton's (2003) definition of extreme or deviant case sampling, the selection of UWSOM's organizational infrastructure was reinforced given its prospect for serving as an illuminative case and likely to provide opulent data as well as deeper insight into the people and conditions substantiating its curriculum renewal process.

UWSOM was ultimately selected as the paradigm for a case study given its regional context, diversity of students and class size, research funding, and educational scope. UWSOM's mission focuses on the education and training of physicians, clinical scientists, and researchers for a five-state region. Its regional attribute is unique, for UWSOM is committed to educating and producing physicians for a territory (the WWAMI Program) that occupies twenty-seven percent of the U.S.'s land mass (WWAMI Region, 2018). The prospect of conducting a case study of a nationally prominent and internationally renowned research institution affiliated with four other major universities (Washington State University, University of Alaska, Montana State University, and University of Idaho in addition to UW) was far too great to surpass.

3.4 Methodological Approach

An intrinsic case study methodology provides the means to conduct an exploratory study and collect evidence pertaining to the influence of UWSOM's infrastructure on curriculum renewal efforts. An intrinsic case study affords opportunities to thoroughly investigate the institutional attributes, and reveal the existence or nonexistence of salient themes or patterns between the organizational infrastructure and curricula approaches or educational objectives (Stake, 2000 as cited in Glesne, 2010). Even more, an intrinsic case study suits the research's purpose, to acquire a greater and transferable understanding of the similarities or differences in UWSOM's infrastructure prior and following curriculum renewal processes. Additionally, case analysis provides the best means to navigate the intertwined, multifaceted development of

medical school curriculum. That said, it would not have been rigorous or realistic to expect that research of medical education infrastructures can produce adequate explanations or reveal underlying themes that are universal among other similarly-situated institutions; due to the amalgamated nature and community-based focus of medical education given the context and variability of resources.

3.5 Data Collection & Analysis

Consistent with the practices of qualitative inquiry, just prior to initiating the data collection stage, I embarked upon a critical self-reflection process of my own philosophical, generational, and preexisting biases and personal assumptions. This exercise in reflexivity was followed with the composition of memos and outlines pertaining to data collection, interviewing, and coding procedures, as well as the organization of field notes taken during preliminary site visits and observations. Subsequently, the collection of UWSOM's official curriculum-relevant meeting minutes and other archival, documentary data (curriculum outlines, mission and vision statements, course catalogues, professional staff and Dean lists, educational program objectives, as well as public/published records such as newspaper articles, journals, and school evaluations) were reviewed for a comprehensive document and theme analysis in context (Marshall & Rossman, 2006). In accordance with Robert Stake's (1995) recommendations for data analysis, all of the documents were 1) organized by curricular phases: Foundations phase = basic science instruction, Patient Care phase = clinical exposure, and Explore & Focus phase = advanced clinical practice and career exploration of the UWSOM educational program (See Appendix C); 2) reviewed for the emergence of initial codes/themes; 3) given a description of the setting and its context; and, followed with 4) the "categorical aggregation" of themes to identify connections or patterns exposed by the accumulation of data (as cited in Creswell, 2007, pp. 156-7). Document analysis of archived documentation and public/published information presented

valuable insight during the data collection and analysis stages, and in preparation for this research study. This was compounded by observation protocol that documented the setting, location, date and time, participant(s), and detailed descriptions of the phenomenon under inspection, along with notes of self-reflection.

To substantiate the emergence of themes and triangulate the initial findings, as well as acquire a deeper understanding of decision-making processes and organizational dynamics, one-on-one (informal) semi-structured interviews were conducted to supplement document analysis. Semi-structured interviews provided deeper insight and richer descriptions of the phenomenon under study – the change process under the scope of curriculum renewal in the 2014-2015 term (Bogdan & Biklen, 1997; Drever, 1995). As such, interviews occurred with the Vice Dean of Education, the Vice Dean for Academic and Regional Affairs, the Associate Dean and the Director of Curriculum, and at least three faculty leaders that lasted approximately thirty minutes to an hour. Only the Vice Dean of Academic and Regional Affairs, the Associate Dean and Director of Curriculum agreed to be audio-taped, of which were both transcribed. Nonetheless, all of the interviews were subsequently member-checked by the interviewees to obtain respondent validation within four weeks following the encounter (Merriam, 2009). All other informal interviews were conducted upon each informant's informed consent, and resulted in notes that were recorded within three to four hours following the encounter. Open-ended interview questions and prompts focused on key themes related to the research question:

(1) the focus of curriculum efforts during the 2013-2014 academic term leading-up to the curriculum renewal's implementation in 2015;
(2) issues that enabled or constrained a school's ability to meet LCME's core competencies;
(3) attention/impact of federal funding on school's core curriculum practices;
(4) the addition/subtraction/reorganization of personnel or human capacities to support or enhance curricular goals; *and*
(5) tactics and strategies for creating buy-in among leadership and relevant stakeholders (Deans, directors, faculty, professional staff, and students) during 2014-2015 curriculum renewal efforts.

In addition to informal interview transcripts and notes, document analysis of curriculum renewal archives, released e-mail correspondence between the Associate Dean of Curriculum and executive leadership pertaining to curriculum renewal objectives, and meeting minutes of various curriculum committees spanning from autumn quarter 2011 to autumn quarter 2015 were systematically coded to expose similar characteristics, themes, and patterns (See Appendix D). This method of categorical aggregation, coupled with the purposeful searching for themes and patterns that differ across institutional types (in this case, prior to and after UWSOM's curriculum renewal intervention), strengthened the findings revealed in the systematic coding processes (See Appendix F). On the contrary, failure to examine disconfirming evidence and/or consider alternative or contrary explanations gathered from various documentation about emerging findings threatened the study's credibility (Creswell, 2007). As such, I purposely employed a method of negative/discrepant case analysis using narrative gathered through informal interviews with faculty and professional staff members involved in curriculum renewal processes and its organization/delivery. The importance of seeking alternative or unconsidered explanations for emergent themes materializing via data analysis aided my methodical aggregation of topics and categorization, and reinforced the overall reliability of the findings.

Even more, to ensure that sufficient time was spent in the field to attain data representativeness/saturation, on-site visits were conducted for one-week durations for a total of eight weeks over the course of a year to provide enough time for observations, field notes, interviews, attendance at curriculum meetings, and the collection, review and analysis of official meeting documents/minutes (Merriam, 2009). Additionally, to gather a richer understanding of the context, random informant chats were conducted with key support staff members involved in day-to-day curriculum operations and/or with course administration. As Clifford Geertz (1973)

asserts, the recording and analysis of rich conceptual details and meanings provide "thick descriptions" of the phenomenon under study, and enrich the process of interpretation.

Overall, the qualitative analysis approach not only offered a breadth of understanding pertaining to the influence of the organizational infrastructure on the structure and function of curriculum renewal objectives and efforts. It also offered the flexibility to examine factors beyond the surface level that may have attributed to UWSOM's actions, focus, and purpose for curriculum renewal (as revealed in the data gathering process within the given period of time).

3.6 Variables

A case study methodology provided the means to conduct an exploratory study and apply both descriptive and diachronic analyses of UWSOM's renewal curriculum processes prior to and following the renewal intervention. (Interventions referred to herein as curriculum renewal efforts to develop and implement more competency-based curricula along with innovative, integrated course content and assessment plans). Although the application of a case study analysis afforded opportunities to thoroughly investigate the existence or nonexistence of structural differences and scrutinize qualitative data longitudinally, a theoretical framework was applied to measure, evaluate, and better understand the context, scale, and degree of change in medical education (Stake, 1995; Yin, 2003).

The term "curriculum" is defined by the *Education Glossary* (2015) as academic content instructed in a specific course or program of study. It is broadly used to refer to as an amalgamation and organization of course content, teaching strategy, learning objectives, and evaluation. For purposes of this research, curriculum encompasses four components:

1) **content**: Lessons and academic materials presented in an aggregation of courses to facilitate the planned sequence of teaching and instruction.

2) **methods**: Specific instructional and organizational processes that comprise a medical education program's course of study; *e.g.*, structure of instruction (Flexnerian "2+2"

education model: two years of basic science study and two years of clinical practice), educational philosophy, teaching praxes, and institutional mission statement.

3) **assessment/evaluation**: A combination of methods, timing, and judgements applied for measuring student progress and appraising competency.

4) **goals/competencies/outcomes**: Expectations or a sequence of benchmarks, courses, and/or milestones used for instructional and learning exercises, and explicitly defined in educational program or learning objectives, to monitor student knowledge, clinical skills performance, and/or measure the successful completion of expected outcomes.

These components were examined within the context of fundamental medical program (national) norms, and measured by variations or deviances from previous curriculum practices and/or subject matter that comprise core medical education standards. In this study, this protocol was applied to the UWSOM's autumn 2014 curriculum and applied again following implementation of the renewed curriculum in the 2015-2016 academic year.

The identification of major themes is paramount in qualitative analysis and in determining the extent to which a medical school can stray from customary, sanctioned models of medical education and time-honored, core education practices while maintaining institutional stability and status. For purposes of this case study, it was vital to examine the content, process, and context (the emergent themes of this study) for curriculum changes and renewal efforts to provide a comprehensive review and accurate assessment of curriculum reform. It also imparted a means by which to navigate through the interwoven, multifaceted renewal of medical school curriculum.

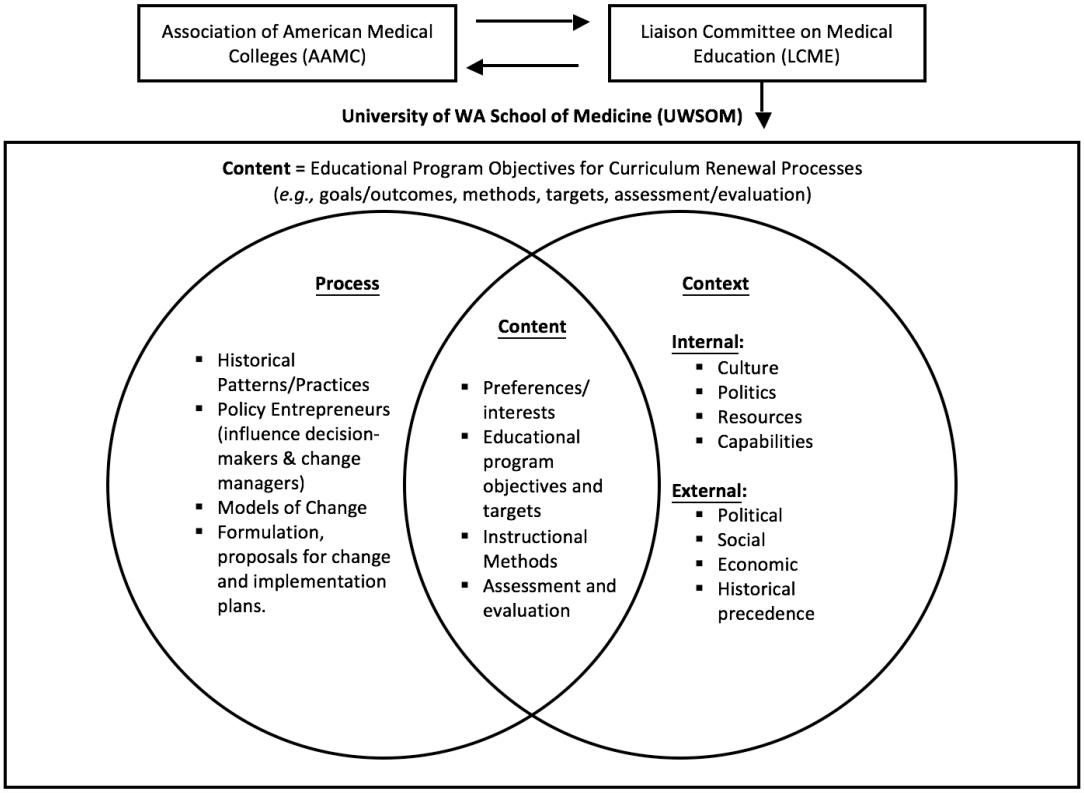
Initially, major themes were identified per the review and analysis of relevant literature that guided this study and subsequently, considered and compared with budding themes exposed from archival documents and transcripts gathered from UWSOM's curriculum office; all of which consisted of seven hundred and seventy-three (773) pages of document analysis (See Appendix E). Five sprouting issues revealed the emerging themes of this research, which were sorted into periodic categorizations of major impetuses for medical education reform. The

periodic categorizations consisted of: 1) national waves of policy reform supported by the LCME and other influential medical governing bodies, such as the Association of American Medical Colleges, AAMC (process); 2) internal leadership changes and succession; (process); 3) changes in national healthcare regulation and patient safety/protection laws (process); 4) shifting student and community demographics (context); and, 5) attention to changing curriculum patterns and instructional practices in prominent, similarly-situated medical schools (content).

From these five main categorizations, emergent factors were identified as being a major subject (theme) of UWSOM's curriculum reform efforts. These themes were apportioned into the following main "progression" categories (in a sort of threefold periodization: the planning and implementation periods of UWSOM's curricular reform in 2015):

Content	Process	Context
▪ educational objectives, learning expectations, assumptions and teaching strategies ▪ course organization and content delivery ▪ assessment and evaluation	▪ education policy ▪ trends and patterns of change over time ▪ formulation of policy ▪ accreditation, governance (governing bodies' interests and standards)	▪ internal: resources, culture, political climate, and capacity (social capital) ▪ external: economics, politics, history, community needs

The deductive relationship among the major theme sets/categories within context are comprised of the following subset of reoccurring topics, or sub-themes. The relationship among the grouping and categorization of sub-topics within major theme sets are visually depicted in the following figure, UWSOM's Curriculum Renewal Process under Kingdon's Multiple Streams Theory. (This figure outlines and affords a visual depiction of the logical relationships between the process, context, and content of UWSOM's educational program objectives as well as the challenges, existing policy, and political factors facing curriculum reform efforts.)

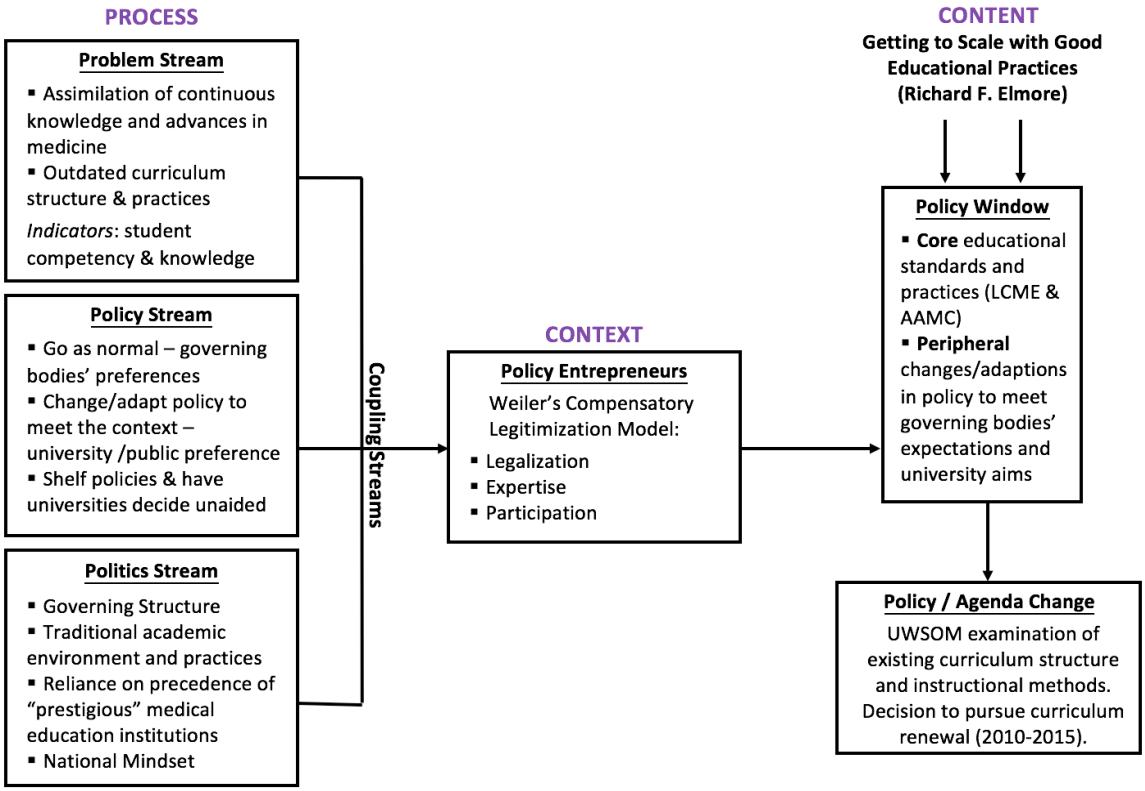


These major themes (process, content, and context) and their variables (sub-themes/factors) were assessed and analyzed via the application of a theoretical framework. The theoretical framework is comprised of John Kingdon's multiple streams theory to assess the development and implementation of curriculum reform efforts (the **process**), Weiler's notion of compensatory legitimation in revealing information pertaining to the acceptance and feasibility of medical education reform efforts (the **context**), and Elmore's hierarchical concept of peripheral and core changes to appraise the outcomes of curricular reform efforts (the **content**).

3.7 The Conceptual Framework/Theoretical Construct – Theory Testing

The review of the literature in medical education, including evidence gathered from studies of education policy and reform across secondary and professional disciplines, yielded a wealth of insight into policy formation (John Kingdon), the impact of major actors/stakeholders acknowledgment of legitimate medical educational structures (Hans Weiler), and the extent to which curricular changes occur given varying levels of institutional hierarchy and governance

under professional accreditation agencies (Richard Elmore). This theoretical construct afforded a multifaceted lens by which to examine peripheral modifications in medical schooling that shield an organization's core from a perceived level of illegitimacy and uncertainty; particularly, in times of reform beckoning for significant and fundamental changes in widely accepted, core educational standards and practices. Kingdon's multiple policy streams theory, Weiler's model of compensatory legitimation, and Elmore's evaluation of core and periphery impacts of educational reform efforts provided a multifarious approach to research of medical education and a comprehensive policy perspective by which to examine the complex interventions and purposes involved in curriculum renewal processes. Curriculum renewal is a continuous process. Hence, the application of a theoretical approach not only provided a systematic and evidence-based process to identify and assess the motivation and process of curricular change, but offered a mechanism by which to hypothesize and theory test the phenomenon (curriculum reform) against an integrated model of theoretical relationships.



This theoretical construct is central to the study, appropriate to the research problem, and feasible within the study's context. Hence, the research relies on "theory testing" under the purviews of Kingdon's multiple policy streams analysis, Weiler's theory of participation per compensatory legitimation, and Elmore's appraisal of core and periphery impacts of educational reform. It serves as the research's compass. A model not only thoughtfully assembled to navigate through the maze of traditional and conventions practices of medical education, but to expose how an array of theoretical applications contribute to a greater understanding of the phenomenon and utilize previous research to enhance and expand upon existing knowledge of curriculum renewal efforts in medical education. The compilation and selection of multiple and major theories offered both diversity and systemization of the literature reviewed, relevant in a case study analysis, and content validity using a theoretical framework to evaluate the study's findings against varying and complementary propositions founded in previous, relevant research (Maxwell, 2012).

Furthermore, the use of three different theoretical perspectives in a single case study analysis corroborates triangulation and hence, enhanced the internal validity of the findings by evaluating the research question from multiple lenses and assessing the strength and/or weakness of inferences made against multiple theories from the data collected. The decision to construct a theoretical framework employing Kingdon's, Weiler's, and Elmore's education policy theories provided a systematic-driven theoretical route comparing complementary theories to better interpret and "understand how differing assumptions and premises affect findings and interpretation" of the phenomenon (Patton, 2003, p. 562). The compilation and organization of this theoretical construct not only offers a means for theory triangulation, but a complementary perspective by which to apply each theory as a contributor to the greater understanding of the phenomenon. Particularly within this study, my familiarity with both the context and discipline

necessitated the construction and application of a conceptual framework comprised of forefront empirical theories germane to education policy in order to analytically appraise the data collected outside my etic conceptualizations.

3.8 Discussion of Methodology Limitations & Complications

Deciding to use secondary data gathered by national agencies, which utilizes a number of metrics to measure and determine school standings, introduced threats to the study's internal validity. That is, the degree to which actual relationships exist between LCME's core competencies, *U.S. News*' rankings, and FSMB funding levels using data collected, measured, and analyzed by other researchers/external agencies. Hence, the choice to use secondary data collected from outside researchers/agencies to compose my sample strategy presented a slight threat to the study's internal validity from the onset. NOTE: Internal validity herein refers to whether the methods of measurement used to confirm the sampling strategy are accurate and measure what was intended to be measured. Further, the depth or level of analysis used in formulating the *U.S. News*' rankings is relatively obscure, since these rankings are assembled and determined by a number of researchers assigned by a major journalism agency to evaluate and appraise institutional rankings. This level of obscurity is small, but is compounded by researchers' natural biases. That is, the extents of researchers' viewpoints, philosophies, assumptions or motivations involved in determining how data is collected, analyzed, and interpreted (Miles & Huberman, 1994). Other than the metrics used to calculate the rankings and competency ratings, no other information is publicly shared regarding the intended research purposes or questions solicited in the original research development and data gathering processes. Thus, in terms of gauging the fidelity of instrumentation used (decisions made regarding the selection of what data to count or which factors to weigh and the best modes of measurement) other than what is publically shared via background, methodology, and other

pertinent information by the agency, the choice and convenience of using secondary data entails the use of data gathered and interpreted for different research purposes and questions. Yet, the triangulation of data collected through various methods outlined and corroborated through document and narrative analyses should in-part compensate for the majority of perils involved with the use of secondary data to support the sample, which may or may not have impacted the study's internal validity.

Additionally, time was limited given my ambitious plan to pursue qualitative methods that utilize a wealth of document collection, review, and coding, as well as narrative (informal interviews/chats) analyses. The extensive data collection, document and narrative analyses required great preparation and organization, as well as the systematic reduction of all the data into categories for condensation into emergent themes and interpretation (Merriam, 2009). All of which, have been supplemented with the creation of tables or figures to offer visual representation of the data collected and the study's findings – collectively, demanded a great deal of time.

Lastly, in order to avoid the appearance of a potential conflict of interest that readers should be aware of, it is dutiful to state my disposition. I was an employee of UWSOM for seven (7) years and was actively involved in the curriculum renewal process. Considering my involvement and for purposes of transparency, I engaged in a conscious and constant process of reflexivity and bracketing. That is, "the process of reflecting critically on the self as researcher, the 'human as instrument'" (Lincoln & Guba, 2000, p. 183 as cited in Merriam, 2009). It is important that I divulge, clarify, and explain my predispositions, perceptions, experiences, and philosophies that may have subconsciously influenced the direction of data collection and interpretation of the study's findings. That being said however, throughout this endeavor I exercised great care to assure that every step taken in the research process was not compromised

by my prior involvement with the organization and in the curriculum reform effort being studied. In addition, I combined the process of reflexivity with peer review and debriefing sessions with past colleagues (all of whom are still employed by the institution at the time of this publication) to obtain independent perspectives of my research and findings to ensure the study's rigor. For these reasons, I am confident that my prior involvement and employment did not unduly impact the research process or the findings and conclusion contained herein. Earnestly, my experience, familiarly, and internal knowledge of the institution (its policies and procedures, governance structure, organizational dynamics, and culture), and professional relationships with faculty, administrators, directors, and other professional staff members afforded me a great understanding of the phenomenon being studied. I was able to interact and observe without altering the flow of day-to-day operations or communication. It not only granted me access to unrecorded document repositories and personal e-mail correspondence shared with me for purposes of this research, but provided me the means to initiate candid conversations with key stakeholders deeply rooted and actively involved in UWSOM' curriculum renewal process. My disposition served as a great advantage in elucidating data and evaluating the phenomenon.

3.9 Fidelity

Data collected throughout the case analysis was triangulated to assure the study's trustworthiness. Foremost, the case's site selection (sampling strategy) offered reliability, for the criterion sampling strategy validated the selection of UWSOM for its potential to yield data illuminating and providing deep insight into the phenomenon of curricular renewal (change) in a regional medical education program. More so, a considerable amount of time was spent on the Seattle campus collecting documents, observing day-to-day operations and curriculum meetings, scheduling informal interviews, and engaging with informants. To obtain a holistic understanding of UWSOM's infrastructure and curriculum renewal efforts, I journaled regularly,

member-checked interview transcripts and notes, and spoke with key informants to ensure a precise interpretation of the data as well as authenticate the accuracy of my findings. I also employed two (2) outside colleagues (a fellow PhD student in the College of Education and a past work colleague) to scrutinize my research processes and outcomes through an external audit of my field notes, research journal, and analytic coding scheme (Glesne, 2010, p. 49).

3.10 Transferability

The intent of this research is to contribute to the general, greater understanding of learning and medical education's institutional structures, within the given context, that may be transferable to other similarly situated jurisdictions. Even more, findings and conclusions resulting from this research may serve to illuminate constraints faced by those involved in developing alternative medical education practices or strategies to be mindful of in reforming medical education curriculum. The utilization of a qualitative approach and comparative case study methodology not only provided a means to study the conceptual complexity of medical education and its scientific disciplines, which are scattered among various sites (classrooms, clinical and rural offices), but offered a more detailed account of human decision-making processes in structured frameworks where governance, legitimacy, and relational roles enabled and hindered the development of new and innovative learning formats.

Further, even though this research is intended for medical education professionals, it may also be referenced by other post-baccalaureate, graduate, professional, or vocational programs. Particularly, other educational programs subject to continuing education requirements that impact the organization and structure of core curriculum processes to meet national accreditation, licensing, research and/or other financing standards/requisites. I am confident that the findings of this study are transferable enough to be applied within general, similarly-situated medical education frameworks, as well as in other professional education systems.

Chapter 4: Part I

4.1 The Structure of Medical Education at UWSOM

The organization of UWSOM is departmentally-based (See Appendix I). Many medical schools share the department centric educational model largely in part to revenue generated from research ventures and/or billing from clinical care (Bloom, 1989, 1995; Dahlstrom, Dorai-Raj, McGill, Owen, Tymms & Watson, 2005; Densen, 2011). Given the monetary influence of departments and their chairs, it is noteworthy to discuss power dynamics and leadership of medical education initiatives.

Leaders are defined by charisma, intelligence, personality, persuasiveness, accomplishments, education, and aggressiveness to name a few characteristics (Carlyle, 1841). According to internal e-mail correspondence dated March 15, 2010, the identification and appointment of key leaders to create buy-in among faculty and professional staff members across regions noted crucial leadership characteristics needed by executive leaders (Deans, members of the Curriculum Committee, and Department Chairs) to initiate reform processes:

> *"We must have a clear idea of what we want to do…we must communicate this vision. […]. People will much rather follow leaders that are enthusiastic, willing to listen, reliable and persuasive with the right title […] even if they disagree with our ideas or committee plans they will follow someone with these qualities."*

These types of conversations and strategic approaches are noted in the literature about medical schools' structures and medical education reform. Particularly, it is often emphasized that the role, title, and stature of individuals leading curricular reform strongly influence the collective onboarding of Department Chairs, course directors, teaching faculty, professional and administrative staff, and members of curriculum committees and sub-education committees (Bucher, 1970; Ebert & Ginzberg, 1988; Bennis, 1993; Lawley, Saxton & Johns, 2005; Muller, Jain, Loeser, & Irby, 2008; Shawwa, 2012). Yet, based upon observation alone and personal

reflection, there was no communication platform implemented for UWSOM leaders to disseminate to relevant stakeholders curriculum-relevant information about faculty development, annual continuous quality improvement processes, and particularly in this research, the renewal processes to relevant stakeholders. This is discussed in further detail in the following subsection, however no published or online reporting mechanism existed and/or publicized to faculty, students, residents, and other implicated basic science departments regarding instructional changes and approaches, curriculum renewal aims, as well as new LCME expectations and accreditation standards other than monthly curriculum-relevant committee meetings with selected/appointed membership. In fact, it wasn't until 2015 that UWSOM's curriculum renewal website was published to launch and documentation was publically distributed of UWSOM's implementation process (Curriculum Renewal, 2015).

Aside from transparency, the importance of providing clear channels for effective communication to engage principle stakeholders (faculty) in the change process is emphasized in Richard Elmore's research on core instructional changes as being essential to convey the actual needs and expected demands for curricular changes – let alone for authentic reformation to occur (Elmore, 1996). It is uncertain why consistent and incessant communication was not prioritized to keep an extensive and diverse community privy and invested in curricular change, for developing objectives necessitates dialogue, scrutiny, and debate by stakeholders for improvement. It is possible that communication may have been hindered due to the recognition that objectives are shaped and devised via critical input and feedback. Given UWSOM's size and regional scope, abstention from publically releasing the status and progress of curriculum renewal developments may have been considered too copious or futile. Or perhaps, subjecting UWSOM's curriculum renewal process and developments to public scrutiny and criticism could have stalled its progress; e.g. the development, planning, timeline, and its implementation,

as well as challenged the aims, visions, and interests involved in guiding the reform efforts.

4.2 Curriculum Renewal – UWSOM's Leadership & Core Curriculum

An analysis of medical educational reform must take into consideration the role of deans, faculty, professional staff, committee and department chairs, course directors, and students. The push for educational reform may derive from national trends and increasing standards mandated from governing agencies, but buy-in from executive leadership (from the dean of the medical school and the dean(s) of academic affairs, education, and the curriculum), as well as influential faculty, especially those that bring large research and/or clinical revenue to the institution, is necessary in order for change to occur. What is important to note is shifts in leadership and the attention placed on legitimizing change in a system that is not considered broken. For, UWSOM's educational program boasts of its uniqueness, forefront regional curriculum program, and topnotch tertiary and primary care services that span a five-state region, referred to as the WWAMI program (UWSOM Admissions, 2017). Not only is UWSOM the largest regional medical program in the country due to its location and appointed legislative responsibility to educate students, but the distinction and exclusivity is reinforced by national rankings, particularly the annual report on the nation's best colleges prepared by the *U.S. News and World Report* (U.S. News, 2016). Hence, to incite and reinforce change in such a system is particularly challenging, and requires either changes in leadership or a transition in the type of leadership being employed.

At the beginning of winter quarter 2012, leadership was identified as being critical for curricular change and buy-in. E-mail conversations among the academic affair deans, which included the Chief of Staff, as well as many members of the Steering, Foundations, Immersion, Transitions, Scholarship, and Governance Committees recognized the need for the deans (especially UWSOM's Associate Dean of Curriculum) to be moderate risk-takers. That is,

willing to purport the great need for curricular changes as being absolutely essential for keeping pace with an ever-evolving society and technological advances, as well as being tenable against resistance from department chairs and basic science faculty. Risk-taking by leadership was reinstated multiple times and in various e-mail communications, but a summation from the Co-Chair of UWSOM's Steering Committee in 2012 (the oversight committee for the entire curriculum renewal process) sums this sentiment up comprehensively:

> *Crossing [departmental] boundaries is not enough or appropriate. In creating this new model [of medical education] the biggest challenge is to keep the departments valuable and the disciplinary orientation and simultaneously develop the new model that lets new ways of arranging faculty, research, education, and patient care.*

Earlier that year, studies of medical education based on the healthcare system flooded academic medicine journals given the passage of time (four years) since the implementation of the Affordable Care Act (ACA) in 2010. Authors emphasizing the need for curriculum reform due to changes in the healthcare system continually referred to sources of authority to legitimize change and reform efforts, along with the careful distribution of resources to avoid departmental competition for limited resources (Nair & Fellmeth, 2017; Drake, 2014; Nation's Health Needs Report, 2014; Quintero, 2014; Iglehart, 2015; Kirstein, 2015). The role of major leaders, particularly the dean, in curriculum reform efforts cannot be understated. Their support and attention to mobilizing resources was continually noted as being fundamental for the process of change.

Weiler explains that legitimacy is constructed by the process, in lieu of what results. This is expanded upon by Claus Offe and Henry Levin via their research of education reform in plutocratic societies (as cited in Weiler, 1984). They contend that a contradiction exists between reform strategies, accompanying grandiloquence, expectations and needs. Although a pluralistic entity has the capacity to change, it is regulated by its leaders and their political interests – a

sentiment shared in informal conversations with UWSOM's Associate Dean of Curriculum and the Vice Dean for Academic, Rural and Regional Affairs (M. Ryan, personal communication, November 12, 2016; S. Allen, personal communication, March 16, 2016). At times, proposing reform policies that the entity is unable to execute. This is expounded upon even more by Jurgen Habermas. Habermas (1975) explains that political dynamics try "to compensate for legitimation deficits through conscious manipulation" (p. 261). For example, education plays a significant role in the socialization and delineation of people, including the sustainment and reproduction of wealth, position, power, influence, and structures. Weiler (1983) applies this notion to educational policy and explicates that the adoption of reform policies is intended for compensatory purposes through three main strategies: legalization, expertise, or participation. Given this case of UWSOM's curriculum renewal initiative, the participation strategy appears particularly fitting; for, the organization and regulation of medical education by the LCME, and under the regulation of institutional leaders' respective interests and objectives, suggests that sometimes reform policies are likely at the disadvantage of genuine reform measures intended to effectuate change at the core (See Appendix B).

The current Associate Dean of Curriculum for UWSOM assumed the role in 2011, having served as an associate professor of basic science for six years as well as a nephrology physician for UW Medicine. He felt impelled to work for academic medicine, in the interests of basic science research, and the sustainment of UWSOM's regional reputation and national prestige. These goals were largely private, but grounded given the context of a regional, research-oriented medical school strategically attached to its primary teaching hospital on the campus of a large public, internationally-renowned, research university (M. Ryan, personal communication, November 12, 2016). Thus, the ideal context for interdisciplinary instruction, training, research, and clinical application in a patient care-oriented environment – all favored

components of the LCME's accreditation standards process pertaining to the functions and structures of a medical school, particularly in 2014 (LCME Standards, 2017).

At the time the Associate Dean started, it was evident that institutional planning concerning the enhancement of learning outcomes was in the forecast, for it topped the agendas of the First-year, Second-year, Required and Elective Clerkship, Theme, and Curriculum Oversight Committees (UWSOM Committees, 2017; see Appendix L). Rationale for this attention centered on the lack of program evaluation and assessment on short-term and long-term objectives, benchmarks, and student outcomes. A report published in 2010 identified a pressing need for UWSOM's realignment of curricular goals and objectives following a decade of discord, scarcity of resources, and polemical leadership (Norris, Wenrich, Wolf, Carline, Schaad, Joseph & Marshall, 2010).

The Associate Dean spent months meeting with the Chief of Staff, the Vice Dean of Education and Academic Affairs, the Director of Curriculum, the Director of Regional Affairs, including the Vice Dean for Academic, Rural and Regional Affairs, and the Chair of the Department of Biomedical Informatics and Medical Education. Throughout these encounters a broad strategic plan was shared and great weight was placed on the last comprehensive review and revision ("renewal") of UWSOM's curriculum, between 1998 and 2001. A number of changes and advances in the healthcare environment, coupled with the accelerated pace of technology and greater awareness to adult learning theory, have significantly impacted medical education practices at many of the tier-one medical schools since 2001. This has only been compounded by the mounting shortage of physicians nationally and, particular to this study, the shortage of physicians within underserved WWAMI regions with expanding rural populations throughout the northwest region with progressing/proliferating trends. UWSOM's leadership felt compelled to initiate the process of curriculum renewal by 2010. It is also important to note that

throughout the 2002 to 2010 timeframe, the adoption of integrated and innovative educational approaches by top-tier medical schools was overwhelmingly attributed to the reformation of LCME accreditation standards (Hunt, Migdal, Eaglen, Barzansky & Sabalis, 2012; See Appendix J).

UWSOM embarked upon curriculum renewal in 2011 with a feasibility study titled: *The Curriculum Pre-Review Environmental Scan.* This study highlighted the trends of other similarly-ranked medical schools, e.g. Harvard, Stanford, John Hopkins, University of California San Francisco, Columbia, Duke, and Yale; and the LCME's reformatted accreditation standards, which emphasized: 1) the application of "entrustable professional activities" (progressive competency set) in the basic science and clinical curriculum; 2) continuous evaluation and measurement of student learning outcomes; 3) the inclusion of population health and diversity, information management, quality and safety; and, 4) congruence of educational experiences across all regional teaching sites (Visioning Committee, 2012). *The Curriculum Pre-Review Environmental Scan* stressed that "all proposed changes" to the existing basic science and clinical curriculum mirrored "domineering" national trends of top medical institutions that utilize active learning and the integration of basic science with clinical practices that met and/or exceed new LCME accreditation standards and disposition (UWSOM Curriculum Scan, 2011, p. 11). Hence, UWSOM noted the change in the basic tenets of medical education due to national awareness of other prominent institutions on adult learning theory and pedagogy; which aligns with Weiler's notion that participation in curriculum policy and reformation in conformity with other well-known institutions corroborates compensatory legitimation via "conscious manipulation" (Jansen, 1990, 30). From Weiler's perspective, the increasing and influential role of the LCME in directing medical education policy, e.g., reformatting accreditation standards and initiating periods of reform, is reinforced by the propagation of 'expert' studies as well as

leading medical institutions' participation in and adoption of LCME-sanctioned policy initiatives and new instructional approaches. All of which support the notion of legitimization through conformity, and an institution's unconformity conjures threats to its legitimacy and status as an esteemed institution. Thus, the premise of legitimation withstanding conformity.

The great shift in medical education approaches cascaded in a domino-like effect from 2002 to 2010 having materialized from national attention brought about by Kenneth Ludmerer's compelling address to the AAMC about the increasing divide in medical education and modern-day practice in 2002 (See Appendix A). Ludmerer's address noted the historical hold of the "Johns Hopkins model" of American medical education, and subsequently incited a rapid interest among leading medical schools to focus on competency-based education metrics and assessment – of which the UWSOM was not immune (Ludmerer, 1999; Lawley, Saxton & Johns, 2005). Even more, by 2012 the LCME had amended accreditation standards to underscore student competency and the vertical integration of basic science content and instruction with clinical practice (Dannefer & Henson, 2007; Densen, 2011; LCME Standards, 2017). It is not surprising that UWSOM's curriculum renewal's objectives included: 1) a heightened focus on competencies, and the recognition that an integrated competency-based education commences with medical school, continues into graduate medical education (residency), and extends into life-long learning processes; 2) the incorporation of interactive learning activities based on substantiated evidence that active learning provides for better student retention than passive, lecture-based methods; 3) a greater focus on contextual teaching using clinical examples and case-based learning to facilitate new active learning measures that foster better student retention than lecturing about and memorizing facts; 4) orient teaching on concepts rather than facts, particularly in a time of expounding and advancing information and technology; and, 5) an awareness to the inculcation of negative habits, biases, and attitudes of attending physicians,

teachers, residents, and other faculty due to the reliance on the apprentice-based model of clinical instruction, despite formal instruction received in lecture halls, classrooms, and wards (UWSOM Visioning Stage, 2012).

4.3 Basis for Findings Germane to the Research's Theoretical Framework and the National Context

Although the structure and delivery of medical education is not considered broken or antiquated, what is perceived as "legitimate" as modern-day practice and national conditions that purport "legitimacy" in medical education is strongly influenced by national standards, and particularly by the nation's main governing body: The Liaison Committee for Medical Education (LCME).

Governing bodies' influence on the structure and format of medical education institutions is not understated. An abundance of research details governance agencies' influence on institutional characteristics, structure, and organization (Cantor, Cohen, Barker, Shuster & Reynolds, 1991; Cohen, et al., 1994; Christakis, 1995; Kassebaum, Culter & Eaglen, 1997; Bauchner, Fontanarosa & Thompson, 2015). Dale (2005) proposes that curriculum reform efforts may take many forms depending on a school's institutional characteristics. Yet, the existence of governing agencies supports and legitimizes the industry in which it operates, and given the industry's size and varying contexts, does not serve to identify problems and means for resolution:

> Within the education policy field, [this is] illustrated by the traditional tension between selective and open-access policies. Policies that would strengthen the selective character of the education system would have the predictable effect of creating resistance and contestation from those excluded by the system (Bonal, 2003, 161).

Hans Weiler (1984) suggests that agencies resort to compensatory legitimation due to the inadequacy of educational reform policies to address and suppress tensions associated with fears

of departing from the norm. Both Richard Elmore and Milbrey McLaughlin (1988) recognize the resistance to change, but contend that school reform is limited given its organization. The crucial component in fostering the adoption of reform efforts is the ease by which change(s) maneuver across the school's echelons – a hierarchy comprising of policymakers/legislatures at the top, filtering through school administrators/executives, and teachers at the base. The success or collapse or reform measures relies on the initiation of policymakers; the interpretation, planning, and facilitation by school administrators; and the endorsement and implementation by teachers at the core of the curriculum. Particularly, Elmore asserts that differences in interests, and hindrances in communication across the echelons are inherent and challenging. The combination of communication impediments and varying interests impede change efforts from readily shifting from one echelon to another and thus, throughout the organization. Therefore, reform attempts are either deferred or suspended between school administrators and teachers.

Yet, governing bodies adopt a relationship interlinking "education, economic prosperity, and meritocracy" (Kelly, 2007, 57). Hence, fostering a market-driven atmosphere whereby institutions are compelled to compete against each other for revenue in the form of tuition, fees, research funding, contracts in both private sectors and public domains, and proceeds from supplementary resources. Institutions aim to increase their effectiveness, e.g. offering a high quality of education, access, and affordability; and align their educational objectives. National ranking syndicates, such as the *U.S. News & World Report*, only propagate the market-driven environment due to public recognition and mindfulness of universities' and colleges' "reputation." Especially within the past decade, the *U.S. News & World Report* has been criticized for "exacerbating the status anxiety of prospective students and parents" (Tierney, 2013).

Peter Eckel's (2008) research pertaining to educational entities with public policy

missions suggests that such actions to increase revenue counteracts aims of effectiveness objectives and/or reform of antiquated instructional practices. For, dynamics associated with an institution's measures to attract students to their educational programs to raise revenue more than often results in a pursuit for prestige (p. 176). Eckel explains that institutions favor the focus on prestige since students' outcomes are difficult to predict and can be inconsistent, and academic performance is challenging to demonstrate given the variability of contexts where institutions reside. Whereas, traits of highly regarded and discernable institutions are easier to qualify and can be synonymic with quality and excellence. What results is institutional comparison. That is, institutions pinpoint the characteristics and attributes of the most recognized and/or prosperous institutions, i.e. the most esteemed/prestigious, and strive to cultivate the same traits. For this reason, and similar to Weiler's theory of compensatory legitimization, prestige outweighs academic outcomes and institutional performance ("effectiveness"). The "appearance" of doing what the most prestigious institutions do not only offsets the quality and distinctiveness of academic institution's outputs, but also sets industry standards and an institution's reputation (Brewer, Gates, & Goldman, 2002). Although prestigious institutions are often associated with outstanding academic performance statistics, the particular trends and characteristics affiliated with prestigious institutions often obscures institutional missions, visions, and distinctive quality improvement measures (Gumport, 2000; Halperin, Perman & Wilson, 2010). Not only are national rankings and performance measures easier for prospective students and parents to digest, but they are quantifiable and hence, provide a means by which to rank and compare respective programs on a national level. Therefore, adopting programmatic traits associated with prestigious institutions serves as a tactic for institutions of lesser standing to advance their "status" by comparison (Geiger as cited in Meek, Goedegebuure, Kivinen & Rinne, 1996; Eckel, 2008).

The persuasiveness and influence of prestigious institutions, often selected by the Association of American Medical Colleges (AAMC) to pilot curricular changes and/or instructional methods, exerts a sense of obligation by other medical schools to subscribe to "best practices" not entirely understood, examined, or judiciously assessed within each respective institution (Brauer & Ferguson, 2015; Josiah Macy Foundation, 2013; Blue, Garr, Del Bene & McCurdy, 2000). As a result, emerging trends or "best practices" reinforce legitimacy in medical school curriculum that is ever-expanding and changing with advances in science and technology (Cantor, Cohen, Barker, Shuster & Reynolds, 1991; Brauer & Ferguson, 2015). It could be argued that "best practices" present as inclinations or trends in education instead of methods verified in practice as well as in similar contexts. Further, the stronger the predisposition to adopt and renew curriculum along with national trends and/or best practices, the more schools may be disinclined or categorized as an unresponsive or negligent outlier if they oppose the majority of adopters (Densen, 2011). Therefore, resistance is deemed as inattentive or detrimental to national calls for modern medical education reform. Hence, as professionals throughout the gamut of medical education aim to identify "best practices," and ostensibly advocate for evidence-based medicine to keep pace with technological advances and new capabilities to collect and analyze data longitudinally and even internationally, so does the capacity for the persuasive adoption or commendation of unfamiliar methods or practices; i.e. adult learning theories that advocate case-based or team-based learning, reflective practices, objective structured examinations (OSCEs), notwithstanding claims of such methods and practices' lack of effectiveness. The adoption or propagation of such methods, and in this case "best practices," centers around conceptualization rather than on how these practices are defined, structured, and employed within the core curriculum (Bleakley, Bligh & Browne, 2011).

4.4 Emergent Themes from the Findings: Leadership, Process, & Context

Three overarching themes emerged from the systematic sorting of codes into major categories that comprised much of the data analysis and basis for the findings (See Appendix F). The findings reveal three clusters of organizational determinants, pertaining to organizational structure, on the implementation of UWSOM's curriculum renewal efforts: 1) characteristics of organizational leadership (individual factors & content); 2) the centralized structure of the organization itself (process); and, 3) the features of its context.

4.4.1 Theme 1: UWSOM's Leadership

Leadership is referred to herein as the features of individual roles and ranks (positions of authority) in the UWSOM organization. Within this analysis, individual characteristics of those holding leadership positions could not be overlooked. Reoccurring themes and observations revealed the influence of individuals' positions and responsibilities on UWSOM's renewal initiatives; for adoption of renewal efforts was strongly motivated and shaped by those in power with widespread communication linkages (great ability to transfer and exchange ideas and serve as resources throughout the region) amongst each other, and in the opinion of some, to the neglect of creating easily accessible communication platforms for mid-level directors and core faculty members to use. This may have been largely imparted to the need and capacity to levy permissions, approvals or restrictions throughout an expansive region. This finding is substantiated by traditional organizational theory and management research. Victor Baldridge and Robert Burnham (1975) whose studies revealed that "structural characteristics of the organization, such as [its] size and complexity, strongly affect the organizations' innovative behavior" (p. 165). For, the relative position and individuals' roles in the organization affect the adoption of innovative ideas and measures. Even more, evidence presented in studies conducted

by Harvey Sapolsky (1967), Robert Dewar and Donald Simet (1981), James Wilson (1989), and Jerry Hage (1999) support findings indicating that individuals with high authoritative positions, excluding core faculty members, and the ability to dispense organizational resources significantly influence the implementation, reorganization, and/or adoption of innovative ideas, methods, or technologies. This revelation proves stronger in expansive and complex organizations (Hage & Dewar, 1973). This may account for UWSOM's reliance on Deans and higher-level leadership to propel the adoption, structure, and implementation of curriculum renewal processes.

Unquestionably, the focus on leadership orientation and organization approaches can grossly undervalue systemic (historical and/or cultural) influences on the implementation of renewal or reorganizational processes, especially in sizable education systems, such as UWSOM's extensive regional system (Perrow, 2014). Gerald Salancik's and Jeffrey Pfeffer's (1977) strategic-contingency model of power explains that engrained power dynamics, and even peripheral interest groups and associations, can constrict leaders' capacities to enact pioneering methods at the foundational/core level, and/or policies in long-standing, historical systems – often incapacitating an institutional leader's authority and power to adopt new processes, procedures, or concepts to adapt in congruence with changing times. The Associate Dean of Curriculum's "emblematic" role in UWSOM's curriculum renewal process was noted often in multiple renewal committee meetings, but specifically in two e-mails sent between executive leaders of the School of Medicine (S. Allen, personal communication, March 16, 2016). This correspondence suggests that the Associate Dean's role and position was obstructed due to longstanding curriculum policies, and tenure faculty's unwillingness to adopt historic, instructional core practices.

The relative role and rank of individuals rematerialized as a broad, over-encompassing theme in document analysis of UWSOM's biannual curriculum meeting minutes from 2012 to 2014 (i.e., who held decision-making authority or the ability to allocate resources to adopt new instructional methods, hire faculty, and outfit new learning spaces), and in semi-structured interviews with the Vice Dean of Education, the Vice Dean for Academic and Regional Affairs, the Associate Dean for Educational Quality Improvement, and basic science faculty members. From a theoretical perspective, individual-level factors are substantially attributed with the adoption of revolutionary processes in conventional education institutions and perpetuated by the position and level of individual authority in decision-making processes. These factors are influenced by job tenure, worldview, educational background, nature of involvement in the institution, and social network (Roger, 2003). Everett Roger (1962; 2003) explains that positive, correlated relationships exist between the espousal and adoption of progressive techniques or courses of action and a leader's length of service, perspective, level of education, longevity in the organization, and loyalty or power as well as the yield of social interactions/relationships with others (in positions of authority) throughout the organization. Understandably, a leader's longevity within the organization affords a sense of systemic legitimacy and the intrinsic knowledge necessary for navigating the political environment, embedded in time-honored institutions, to achieve desired outcomes. For example, it is reasonable that the Vice Dean for Academic, Rural and Regional Affairs, as a longstanding member of executive leadership and tenure member of the WWAMI program, was aware and knowledgeable of how to advocate for renewal measures strategically aimed to support regional sites' plans to expand and adopt different, but beneficial curriculum practices.

Given the emergence of themes about characteristics of individual leadership roles and rank on the organization and compounded per the theoretical evidence provided, the effect of

established roles and ranks, longevity, and position in UWSOM's structure posits that the institutional knowledge, proficiency, know-how, and interests of individuals in leadership roles advocated and it appears significantly appears to have influenced UWSOM's renewal aims and implementation efforts. This is a proposition supported by John Kingdon's characterization of policy entrepreneurs and multiple streams theory, particularly in his analysis of the political stream. This is expounded upon in the discussion chapter under the subsection titled: "Deliberating the Theoretical Framework: Multiple Steams Theory and UWSOM's Curriculum Renewal Process."

4.4.2 Theme 2: UWSOM's Renewal/Reform Process – Centralizing the Organizational Structure

Inevitably, organizational attributes either facilitate or hinder change regardless of whether change is necessitated or beneficial. In the past forty years (1971), there have been three major UWSOM curriculum revisions (Schwarz, 2014). Analysis of UWSOM's historical documentation chronicled at the onset of the most recent curriculum renewal planning meetings in 2012, and subsequent meeting minutes recorded during the initial implementation stages, exposed four sub-themes concerning the School's organizational structure: external credibility, centralization, functional division (departments/division of operational subunits), and subject matter expertise/specialization (See Appendix I).

UWSOM initiated curriculum renewal talks with a thorough examination of other medical education institutions' considerations, strategies, and actions taken during their respective curriculum renewal planning and implementation phases. These institutions' organizational arrangements were studied and served as models of both successful and unsuccessful implementation practices relating to curriculum renewal efforts. Most significantly, the most successful schools' methods and approaches offered great insights, blueprints, and

established credibility for innovative models of undergraduate medical education systems contrary to the enduring prototype; that is, the traditional Flexnerian "2+2" model: two years of basic science study followed by two years of clinical practice ("The Flexner Report," 1910). The successful integration of curriculum redesign processes by external institutions disseminated information and strategic knowledge of effective mechanisms for the organization and systemic adoption of curriculum renewal endeavors.

Centralization was a recurrent theme under the organizational structure category (See Appendix L). Substantiated by member checks with participants, centralization was mentioned and attributed almost synonymously with the organization of curriculum renewal's implementation. Executive leadership and appointed faculty leaders with decision-making authority and access to powerful regional stakeholders (such as Deans and administrative heads), were credited with the effective facilitation and organization of the renewal's progression and implementation. Due to the sheer size and total number of renewal stakeholders spanning the five-state region, mid-level directors and coordinators throughout the region referenced the impossibility of communicating and implementing renewal objectives, as well as maintaining accountability practices consistently across multiple provinces, without the concentration and centralization of decision-making powers of UWSOM's executive body. Many organizational theorists cite similar claims regarding the advantages associated with the centralization of governing and policy-enforcing bodies that enforce collective adherence to required organizational objectives, tasks, and responsibilities (Coleman, Katz, & Menzel, 1966; Burt, 1973; Massarik & Gibson, 1995; Grover & Vriens, 2006; Riley, 2014). These theorists contend that main stakeholder's interests, motivations, and relationships among other key decision-makers (latitude of the social network) encourage centralization in the adoption of innovative processes. Under this perspective, perhaps the weight of a major accreditation body (the LCME)

is not solely to blame for the impulse to advance curriculum structures and practices. It may be more attributed to UWSOM's hierarchical structure, which is necessary for the preservation of its managerial integrity given the large regional context spanning across five states.

Given the vast size and multi-state context of UWSOM's WWAMI program, which encompasses over twenty-seven percent of the U.S. land mass, the functional division of educational objectives, tasks, and responsibilities are reliant upon the competency and coordination of multiple, specialized departments to carry-out the clinical education phase of the medical program (WWAMI Region, 2018). UWSOM's maintenance of its centralized arrangement circumvented any complications that could have arisen per the reorganization of departments' configurations and clout (See Appendix I). Instead, specialists were directed to focus their energies towards preserving the status quo while steadily dispensing elevated subject matter expertise and skills associated with new technologies and advancements/techniques within their respective field/subunits. Centralization of curriculum renewal efforts maintained the existing level of collaboration among subunits/departments and did not disrupt the present governance structure, which dodged potential problems associated with multiple, conflicting interests and greater demands for auxiliary resources that often surface in organizations with many formally divided, self-sustaining functional units.

4.4.3 Theme 3: The Size and Scope of the Context (Regional Medical Education, the WWAMI Program)

Text and narrative analyses substantiating the findings revealed an overwhelming and reoccurring focus on the size and scope of UWSOM's context. The role of context and organizational behavior has been well-researched and discussed from many theoretical perspectives. Most often, context is related to competitive market theories that suggest competition as the motivating factor involved in organizations' adoption of innovative practices

or renewed strategies to maintain or garner a greater competitive advantage or market share (Utterback & Suarez, 1993). This is important to note, for attention to UWSOM's competitive advantage and reputation as a prominent research institution spanning the largest regional program in the country may have influenced curriculum renewal measures.

It was widely contended in Curriculum Committee meetings and informal interviews from 2015 to 2016 that considerable attention was directed to the size and scope of curriculum renewal objectives given the WWAMI[vii] program's expansive, multi-state region. Initially, concerns were oriented towards establishing a "critical mass" of key stakeholders to warrant the acquisition of curriculum renovations across the region (See Appendix M). So, renewal initiatives were not viewed by regional stakeholders as being "Seattle-centric" or enacted without careful deliberation about the region's needs and objectives. Great importance was placed on creating mutual and collective acceptance that curriculum renewal efforts were necessary and adoptable to circumvent complications that could arise due to the variability of interests and needs across WWAMI's extensive network.

WWAMI's size and large educational scope necessitates the differentiation of various clinical departments to streamline and coordinate didactic activities across distinctive regional contexts. Hence, the focus on building collective buy-in and reception to renewal plans. With the sprawling growth of the regional program over the past forty-five years, class size has demanded the delineation of administrative practices and given rise to specializations to meet regional contexts and exigencies. Particularly, during the times of substantial program growth (the 1980s and late 1990s/early 2000s), uncertainty stemming from the addition of new teaching sites and

[vii] WWAMI is the acronym for the University of Washington School of Medicine's (UWSOM) regional education program, which consists of a partnership formed in 1971 to provide medical education among four (4) states in the northwestern United States: **W**ashington, **W**yoming, **A**laska, **M**ontana, and **I**daho.

decreasing state budget appropriations for medical education compelled the adoption of innovative curriculum processes and practices to sustain and maintain consistent operations across states (Schwarz, 2014). Arguably, this has been perpetuated by the great volume of educational and clinical activities that must be coordinated across state lines and at a mixture of urban and rural sites. Accordingly, the adoption of curriculum renewal endeavors had to be perceived as being essential and adaptable enough to accommodate growing class sizes, as perpetuated by greater healthcare demands resulting from regional population growth.

Goals to increase class sizes to address growing population needs in the pacific northwest, compounded by the existing size and scope of UWSOM's organizational infrastructure and the addition of new rural clinics and sites in the 2014-2015 academic year, may have influenced the adoption of curriculum renewal initiatives throughout the region. The need to train and produce new physicians for an ever-expanding region may have been too compelling to impede the implementation of curriculum renewal measures.

Chapter 4: Part II

4.5 UWSOM's Core Curriculum

UWSOM prior to initiating the curriculum renewal process was largely discipline-oriented centered on the assembly and transmission of knowledge by experts in the form of course chairs, teachers, guest lecturers, researchers, basic scientists, etc. As many other medical students throughout the country, UWSOM students progressed one discipline at a time focusing on the memorization and regurgitation of knowledge and applied basic science principles (See Appendix G). Very little integration among basic science courses within the first- and second-years of the program existed, and longitudinal integrated clerkships in the third- and fourth-years, the clinical education component of the program, only existed as a pilot in the Alaska region. Presently, post review of the data, the clinical phase of the program remains specialty focused with instruction being hospital-based and sequenced. Required clinical clerkships remain largely intact, and are completed per discipline as students rotate through hospitals, clinics, and wards interacting with patients presently receiving care. (Students are not assigned a patient panel in order ensure required exposure to particular ailments or procedures. The size of the region and wealth of student-to-patient encounters ensures this.) Assignments are site-based, yet provide rich learning experiences given the size of the region and range of patient care (C. Lamb, personal communication, March 16, 2016).

Medical schools have predominantly been discipline focused, and many practicing physicians and educators relate their education with being based on information amassed and transmitted from the benevolence of lecturers, attending physicians, preceptors, etc. (Schwartzstein & Roberts, 2017). Even with the recent paradigm shift in medical education, which strays from the lecture-based approach to teaching medicine, medical students still focus

on memorizing facts and learning the foundational science of medicine per discipline (split by quarter or semesters terms), but occurring within the same timeframe (Ball & Cohen, 1999; Armstrong, Mackey & Spear, 2004). Overall, it was found that course integration is nonexistent and didactic lectures are the norm. This is debatable given UWSOM's transition from department-based to new integrated organ-system based curriculum. More so, within the past three decades, UWSOM has slowly adopted the "SPICES" model of curriculum design. The SPICES model advocates for a student-centered, team-based learning approach integrating interprofessional instruction and community-based education along with elective studies (in the form of intersession content in the curriculum) systematically sequenced throughout the M.D. program (Harden, Sowden & Dunn, 1984; See Appendix N). This is congruent with national trends in medical education, which purport evidence-based medical (EBM) research, as well as humanism (the patient as a person rather than an ailment) as the most effective and progressive process for teaching medicine (Petersen, 1999; Ramsey, 2002).

Almost immediately upon the onset of the curriculum renewal process in 2010, the Associate Dean of Curriculum's schedule was filled with many UWSOM leaders (notably the Chief of Staff, Vice Dean of Education and Academic Affairs, regional Deans, the Chief Medical Officer, Medical Director of Care Management and Population Health, and the Chief Communications Officer) eager to share their ideas, recommendations, and vision for the future of educational programming (what Kingdon would refer to as 'policy leaders'). By October 2010, the Dean of Curriculum following the advice of the Chief of Staff, identified the need to appoint an LCME accreditation leader. More formally, an Associate Dean of Educational Quality Improvement to monitor the progress of renewal primarily for the UWSOM's approaching reaccreditation year, 2017-2018 (S. Kim, personal communication, October 12, 2011). (Note: this role evolved into the Chair for the LCME Re-accreditation Committee in February of 2014;

which suggests that curriculum renewal processes were formulated and planned with careful consideration to LCME accreditation standards.) This evolved throughout the 2012-2013 academic year into fourteen (14) renewal committees, each composed of faculty, professional staff, and at least one student representative. These committees consisted of the: Foundations Phase, Patient Care Phase, Advanced Clinical Skills, Exploration & Career Focus Phase, Primary Care, Health Equity, Ethics & Professionalism, Quality & Safety, Communication & Interprofessionalism, Diversity, Lifelong Learning, Scientific Discovery, Assessment, and the Governance Committee (WWAMI Curriculum Review, 2014; Renewal Steering Phase, 2015; See Appendices K & L). Conspicuously, the committees highlight UWSOM's program strengths (primary care, patient care, quality and safety, scientific and discovery, and assessment). The committees also addressed deficiencies noted in UWSOM's re-accreditation period from 2008-2009. These deficiencies included citations pertaining to interprofessionalism communication, diversity, and student mistreatment. Each committee, comprised of faculty and professional staff members from various backgrounds, disciplines and interests, was charged with prioritizing specific aims (e.g., research, patient care, finance, communication, public policy, government, etc.) and tasked with developing strategies by which to improve or sustain the chosen aims (S. Pomerinke, personal communication, March 25, 2013). Some speculated that these aims/goals were selected by leadership to address deficiencies as well as highlight outstanding aspects of UWSOM as a result of the accreditation process conducted in 2008-2009. Yet, leadership purported that the aims were interlinked, and the medical program's continuous quality improvement measures relied on enhancements or solutions to deficits of the other (F. Roberts, personal communication, March 18, 2014).

As committees envisioned goals, measures, and plans to meet respective aims and leadership's vision of curriculum renewal through a series of UWSOM-sponsored retreats and

two-day workshops that served as strategic planning events, including senior leadership of the educational programming; i.e., the Vice Dean of Education and Academic Affairs, regional affairs Deans, the Director of Curriculum, various course directors/chairs. Noticeably absent were members of UWSOM's senior leadership team. For, the Associate Dean of Curriculum felt that these individuals would take greater ownership of the renewal process, implementation, and outcomes without senior leadership present to subliminally outweigh the process (Renewal Developmental Stage, 2015). In accordance with Richard Elmore's perspective, as schools periodically update the curriculum in an attempt to implement modern or progressive practices, often those processes that involve radical changes are more often attributed to external pressure for reform (Elmore & McLaughlin, 1988). Further, following a "kick-off" event with much fanfare and public attention, including publications in statewide and local newspapers upon the onset of UWSOM's curriculum renewal process, Elmore's and McLaughlin's (1988) research explains that celebratory tactics include the appointment of strong charismatic leaders to develop and deploy the strategic plan, obtain buy-in and endorsement from influential individuals within the organization, assemble working groups, and identify potential barriers to change or fears related to implementation (Elmore, 1996; Watson, et al., 1998; Davis & Harden, 2003; MacCarrick, 2009). However, reform leaders and leadership executives often underestimate the time, energy, and resources required to implement and refine reform efforts. Not to mention, the lack of attention to and research on similarly-situated institutions with documented testimony of major reform efforts and successful, strategic approaches. Yet so, regardless of calls for reform in medical education, little changes in term of the "core curriculum" (Christakis, 1995; Willman, 2010; Sargent, 2001). So, despite aims to build strategic communication plans for reform, track changes and the implementation of new instructional methods' development over time, a lack of attention is focused on how changes to the core curriculum for the purposes of renewal is

received, interpreted, and implemented by frontline faculty. This is emphasized in John Bligh's (2002) research of Sherbrooke University in Montreal, Canada that found, regardless of influential leaders' and committee members' pledge to reform and drive to share progressive pedagogical insights, few schools produced proof of deep-rooted, sweeping, sustainable, and effective change to core curriculum arrangements and instructional practices (p. 896).

As UWSOM deans and faculty assembled to revolutionize the existing curriculum, over the span of five years (2010-2015), overwhelming attention was devoted to medical education norms, standard practices, vocabulary, and the customs of other external, similarly-situated schools. Progressively, industry norms dominated discussions of curriculum and instructional development. With ever-increasing attention to the institutional environment, what was originally intended to be a reinvention of the existing curriculum became termed as a curriculum "renewal" project. Extensive budgetary resources, initially planned for the reinvention process, were reallocated to the hiring of external consultants (AMBiT Consulting) to reconfigure and integrate all existing, foundational science courses and clinical experiences for incoming students entering in autumn quarter 2015 (WWAMI Curriculum Committee Minutes, 2014).

By all accounts, the reform outcomes have resulted in a heavily integrated curriculum structure, but it consists of an amalgamation of former courses with pre-existing or added content. Additionally, a few majority of the faculty have incorporated new and inventive teaching methods. Content was renewed and reorganized, and some faculty committed to formally experimenting with team-based learning (TBL) – reducing volunteer-based lecturing within courses. Block courses have been merged together with new course titles and prefixes symbolizing the new curriculum's emphasis on organ-based biomedical science. For example, new courses share the similar course content, format, role, processes, and instructors as in the previous curriculum, but have been renamed utilizing the new course prefix: MEDSCI

(UWSOM Renewal, 2015).

The impetus to experiment and adopt with TBL methods commenced following a WWAMI-wide all faculty academic retreat for education that opened with a half-day TBL plenary in June 2012 (AWARE Retreat, 2012). Many of the early TBL adopters led curriculum reform efforts, particularly two highly esteemed course chairs for gastrointestinal and reproduction who committed to implementing variations of TBL heavily throughout their courses. Whereas other course chairs, for instance the same professors in the former curriculum for the cardiovascular and urinary system courses (HuBio 540 and HuBio 562 respectively), amalgamated their courses into one large MEDSCI course – Circulatory Systems (CPR); which consisted of the same small group instructors to present new team-based learning small group sessions.

UWSOM's adaptation or divergence (perspectives varied among informants of this study) from its original aims to revolutionize traditional methods of medical instruction via the means of a renewal process, is best elucidated by the organizational theory of normative isomorphism. Isomorphism addresses an organization's acquiescence to the influence and prescribed norms of its broader environment (Huerta, 2009). Per UWSOM's AWARE Retreat in June 2012, substantial attention focused on the institutional environment, which strongly influenced the adoption of traditional TBL methods and placed implicit parameters on any grandiose visions to restructure and create a truly innovative educational program. Internal influences and pressures led UWSOM to adopt a "new" curriculum with a modern prefix, MEDSCI, but the infrastructure and core medical education practices (TBL) remain relatively the same. Organizational theorists, Walter Powell and Paul DiMaggio (1991) explain that the net effect of isomorphism persuades organizations to adopt and increase homogeneous organizational arrangements given environmental pressures. For, normative demands to

homogeneity arise from the shared attitudes, beliefs, and approaches of professional groups (in this case faculty). This notion of isomorphism exposes UWSOM's reliance on the institutional environment condoning the utilization of TBL teaching practices to validate new curriculum measures; which limited innovation to UWSOM's existing core curriculum structure and hence, revealed legitimacy constraints on groundbreaking efforts.

By all accounts, the charges for reform have been deemed necessary and justified by the main governing body, the LCME, but the implicit importance of legitimacy engulfed UWSOM's curriculum restructuring process. UWSOM's departure from traditional instructional norms to its evolution as a curriculum renewal process, resulted in the amalgamation of existing courses to symbolize its reinvention, highlights the preservation of emblematic processes to signify legitimacy within the "institutional environment" (Meyer & Rowan, 1991). Even more, UWSOM employed common terminology throughout the restructuring process to sustain an impression of legitimacy and maintain its institutional affluence and survival; e.g., careful attention to retaining common courses, processes, ceremonial formalities, and organizational roles under LCME standards and the watchful eye of competing institutions (e.g., Washington State University, WSU).

Chapter 4: Part III

4.6 Discourse – Implications of the Findings on Curriculum Reform Policymaking

Particular to the realm of instructional design for medical education "renewal" purposes, both improvement and expansion efforts have focused on the evaluation of current educational practices to develop universal and effective instructional methods aimed at yielding successful student outcomes. However, instructional policy design is a complex process, and the ability to identify common principles that produce outstanding student achievement in a variety of different educational contexts is inconceivable given variable capacities, priorities, values, and resources present in diverse institutional settings. Hence, no universal framework exists which specify absolute principles that constitute a comprehensive and efficacious approach to medical education reform; for the development of instructional practices in medical education is reliant upon the decision-making processes of curriculum Deans and faculty in response to governing bodies (Dimitroff & Davis, 1996).

Presently, UWSOM's aims to address the Northwest's physician shortage, a prominent issue arising from the implementation of the Affordable Healthcare Act (HR3962), and provide rural inhabitants with adequate healthcare via the creation of a new four-year medical school program in Spokane, WA (Takahashi, 2014; Long, 2017). The inception of Washington State University's medical school was also influenced by projections indicating a multimillion dollar impact on Washington State's economy (WSU Feasibility Study, 2014). To date, UWSOM's Steering Committee reinforced UWSOM's curriculum renewal efforts, as well as the creation, formulation, and implementation of an integrated curriculum focused on training competent, modern-day clinicians to address the physician shortage and support the expansion of the WWAMI program (UWSOM Steering Committee, 2014, p. 4).

Given my wealth of time and familiarity reconciling the data gathered and analysis comprising the findings discussed herein, I propose a six-component approach to instructional policy design that incorporates both macro (organizational) and micro (departmental or units) factors as a means to guide a regional curriculum renewal process. Components of my strategic approach identify: core content, political, cultural, ideological, historical, variable capacity, theoretical and empirical research in instructional practice, internal and external constituencies, and economic and budgetary resources as considerations of quality instructional design and inform the cultivation of a renewed community-based medical education program. The components aim to facilitate the comprehensive approach and formulation of an outstanding medical education program, and incorporate policy design elements that acknowledge seven fundamental tenets of the instructional core framework that address major dimensions of teaching and learning (Darling-Hammond, 2006; Guadarrama, Ramsey & Nath, 2002; Ball & Cohen, 1999; Goodlad, 1994).

The following six policy components focus on the design and implementation of new instructional methods, which offer quality and high-levels of medical student learning, highlight a theory of action, and clear explanations for each design element's application in teaching practices with regard to renewal policy design challenges. Especially in consideration of the availability of resources and varying capacities of administrators and faculty specific to WWAMI's large regional context, it is possible that the following principles may vary in both interpretation and connotation. Hence, I have segmented and provided explanations and information as to how each principle is understood and applied in regional and rural instructional formats.

My analysis deconstructs UWSOM's curriculum renewal process into a five-component approach to policymaking for the design and implementation of renewal objectives with attention

to core instructional policy design challenges and five dimensions of teaching and learning. The five dimensions are: 1) generating a compelling vision of sound, "good" instruction and leadership; 2) addressing variable capacity among classrooms, departments, and school; 3) developing accountable practices in teaching and learning; 4) building and sustaining a constituency for instructional and curriculum renewal; and, 5) motivating and supporting professional learning communities (Knapp, Copland & Talbert, 2003). This provides a more comprehensive explanation of each component's application in the curriculum renewal's policy design processes, as well as a critical analysis and recommendations for another similarly-situated medical school (UW Center for Educational Leadership, 2015).

4.6.1 Defining Core Content

The initial component, core concepts, suggest that instructional policy approaches identify concepts that meet the knowledge criteria specified by national licensing requirements, and provide a solid learning basis for the aggregation of new knowledge as students progress through the medical program. Although licensure serves as an appropriate guideline for developing curriculum content, attention towards the development of an integrated curriculum aligns instructional objectives with major teaching points and content areas. Integration aims to develop student learning all-inclusively. That is, cognizant of how subject matter (medicine) is translational and interdisciplinary, and may be applied to enhance conceptual knowledge into meaningful medical practice, research, and patient care over the course of the medical program's curriculum (Fink & Markholt, 2011). Initial discussions of UWSOM's content development took into consideration inclusive instructional strategies that aimed to engage student learning and provide for the fluid transfer of responsibility for learning, via the demonstration of specific skills and knowledge, from clinical professors to medical students.

Further, instructional strategies incorporated comprehensive curriculum development

throughout the educational program's four-year duration, placing greater emphasis on fostering gradual transfers of learning from teachers to students, and promoting decision-making grounded in shared institutional consensus of what defines good instruction. In this instance, UWSOM's core faculty did develop integrated curriculum content with instructional design practices in mind. As UWSOM administrators, faculty and professional staff shared clear and compelling notions of how team-based pedagogical practices are proven to promote student learning (and how methods may be adapted to meet global awareness, ideological differences, and cultural diversity – all attributes of students' variable learning capacities) there was no direct, readily accessible platform by which to communicate these ideas and objectives (F. Roberts, personal communication, October 16, 2015). Hence, facilitating a more comprehensive approach (fluid communication among core faculty and leadership) in the design of curriculum content, mindful of the concepts and skills central to medical disciplines, but with added emphasis on instructional methods that promote student learning within teaching and permit directed decision-making among faculty and administrators that address individual learning needs (Fink & Markholt, 2011).

All in all, core content was expanded to not only identify key concepts throughout the basic science disciplines, but provide core faculty with team-based learning strategies and methods that foster relationships between students for the greater transfer of knowledge and skills. Additionally, sharing strategies among faculty at educational retreats afforded even more integration of content among basic science course chairs and clinical practitioners, aggregated learning across curriculum phases, and incorporated decision-making policies adaptable and responsive to student learning. Thus, the development of an expansive and interdisciplinary approach bridged instructional plans and practices with integrated content, and greater teacher and student interactions (City et al., 2009). Now, the major challenges are to: 1) ensure that

essential TBL and other implementation principles are adhered to over-time; and, 2) maintain consistency of practice and application among core faculty members and hence, sustainability.

4.6.2 Attending to Political, Cultural, Ideological & Historical Components

Instructional strategies must consider relationships among students' variable academic backgrounds, life experiences, cultures, languages, values, and beliefs, and their impact on students' learning processes. The learning architecture of policy designs must acknowledge these disparities in the instructional design process to address student learning within the given context, apply mechanisms that effectively engage students in the learning process, and provide faculty and administrators with indicators to measure the effectiveness of pedagogical practices and data support for the evaluation of student progress; which may be aggregated with sociocultural factors to identify trends or achievement gaps in association with content-specific areas or medical disciplines (Copland & Knapp, 2006). The development of a team-based learning framework offers institutions with an instructional infrastructure focused on student learning, which utilizes data to evaluate student progress, and identify content areas within the curriculum that may be in need of instructional improvement interventions. It was beneficial for UWSOM to incorporate an interactive framework cognizant of variable student learning conditions, due to variations in students' academic and cultural backgrounds across the WWAMI region, and provide faculty with formal and informal student information (utilized in curriculum planning and instruction) to create effective, inclusive pedagogy. Information was also shared pertaining to professors' teaching practices across the region to reinforce efforts to improve overall student learning outcomes (Plecki, Halverson & Knapp, 2014).

4.6.3 Addressing Variable Capacity

Variable capacity addresses the variations that exist in the knowledge and skill sets of

faculty, administrators, and students. While investments in instructional capacity building do not evoke immediate results or gains in student learning outcomes, measures addressing variable capacity can serve to create collective buy-in among medical educators in evaluating existing teaching methods, and fostering internal accountability measures that support improvements in instructional practices. Particularly, professors and instructional leaders engaged in the organization and creation of professional development opportunities develop internal accountability systems that utilize varying levels of commitment, motivation, training, and experience as viable resources for the improvement of instructional practices (Danielson, 2011).

Instructional policy designs must account for variable capacity throughout classrooms, across medical institutions, and among professors. The challenge given UWSOM's regional context is that the LCME demands consistency and comparability of the medical education program across teaching sites. Hence, supporting professional development and offering professional development opportunities is not only necessitated to build the knowledge, skills, and competencies of instructional leaders, but crucial in developing a shared vision of good instructional practices that propagates improvements in instructional methods across the five WWAMI state lines. Further, addressing variable capacities via the formulation of professional faculty development opportunities that engage professors and instructional leaders in developing accountability and shared understandings of good instructional practices, promotes internal accountability over student learning processes and reinforces assessments of instructional methods to identify areas for improvement.

Even more, professional development opportunities focus on developing extensive mentoring networks to adapt and/or redevelop instruction to meet diverse student learning needs, or for the creation of evaluation tools that assess instructional practices, measure student progress and monitor subject matter expertise, as well as identify opportunities for instructional

interventions. For, professional development opportunities, aimed at addressing educators' variable capacities, may have served UWSOM well in promoting accountability practices grounded in evidence, data gathering, interpretation, and inquiry.

4.6.4 Incorporating Theoretical and Empirical Research in Instructional Practice

Especially within the realm of medical education, memorization is considered a fundamental tenet for instruction of the basic science curriculum. The base of medical school education is rooted in the retention and regurgitation of information pertaining to biological processes, the structure of the human body, and barbiturates used for the management of human pain and afflictions. Memorization is perceived as the core objective of foundational instructional practices, since it is necessitated to establish a solid foundation for further medical education and training. Although certain disciplines necessitate memorization, such as UWSOM's pharmacology and biochemistry threads, clinical phases of the medical education curriculum do not rely on memorization as the basis of medical student's knowledge and skill development.

Generally, investments in expanding instructional practices to incorporate inquiry- or discovery-based instruction practices in medical disciplines involve changes to the structure or formats associated with student learning. However, changes in UWSOM's medical education practices did not alter the instructional core and completely integrate all active and team-based learning into all curricular components. Student-learning outcomes were still favorable, but underscored the disconnect in students' basic science knowledge and clinical skill development (City, Elmore, Fiarman, & Teitel, 2009; Joint Labor, Health & Social Services Committee, 2015). For, improvements in content, pedagogy, professor's knowledge and skills, and medical students' engagement in the learning process fosters increases in student learning and retention

(City, Elmore, Fiarman, & Teitel, 2009).

Given UWSOM's regional structure, the formulation of teaching clusters was necessary for course chairs tasked with teaching the same courses at different WWAMI sites to deliver the same content, instruction, and examinations – harmonious with LCME standards that stress continuity and the comparability of teaching and clinical experiences at all regional sites. These groups emphasized the development of common language for student-centered instruction. Further, the WWAMI's basic science faculty clusters created frameworks that noted major content areas along with instructional strategies to promote higher levels of student learning and engagement in team-based learning processes. In addition, the application and involvement of basic science faculty across the WWAMI sites incorporates individual analyses and evaluations of students' cognitive engagement in the learning process and performance on exams (City, et al., 2009, pp. 35-36; WWAMI Regional Medical Education Program, 2017). In UWSOM's existing clinical setting, a common language pertinent to instructional practice has been developed along with investments in faculty to further their instructional practices in clinical settings, which facilitate consistency, higher-level learning, and cognitive engagement among students.

4.6.5 Acknowledging Internal & External Constituencies

Medical schools must anticipate societal and student learning needs in ever-evolving healthcare systems. This is defined as an obligation to direct education, research, and service-learning activities towards addressing priority healthcare concerns within the context of the region community, or state the institution is mandated to serve (Boelen, 2008). Legislatures, health organizations, businesses, healthcare professionals, and the community collectively prioritize health and health-related concerns. This implies that medical schools produce graduates, research, and services that make direct contributions to the local community and

provide outputs responsive external "management" accountability systems outlining expectations, pressures, tools, and resources – core educational objectives of UWSOM's regional medical education program (Knapp & Feldman, 2012). For purposes of sustainability and future instructional design policy to maintain UWSOM's core educational objectives, the great focus on responding to and delivering on external demands must also take into account internal accountability measures to ensure that time and attention is devoted to quality improvement processes for continuous program improvement. Thus, developing accountability practices that conjure a sense of collective responsibility among internal and external constituents (administrators, faculty, medical education affiliates, and the regional community) over the quality of student instruction, fidelity to established instructional practices (like team-based learning, TBL), sustain instructional development, and support instructional renewal efforts.

4.6.6 Attention to Economic & Budgetary Resources

It is noted that instructional policies should not be based in ambiguity or implicit design assumptions (Powell, 2004). UWSOM's renewal framework attended to general and prevalent trends in medical education, which surmise important considerations for the development of curriculum renewal policies. This is illustrative of the closed networks by which Washington State policymakers operated, often in conditions of uncertainty due to changes in legislative operating budgets (concerning institutions of higher education) and variable implementations of both federal and state healthcare policies (Nation's Health Needs Report, 2014; WSU Feasibility Study, 2014). Yet, the development of new instructional practices and integrated curricula did not take into great consideration the availability and allocation of local and regional resources (so that the renewed curriculum transverses variable regional contexts and existing resource limitations). Implementing new curriculum across the WWAMI region took into account the conditions relevant to its local content to maximize existing resources. However, legislative

funding allocated for investments in learning improvement measures and to finance instructional development remains literally nonexistent. That is, no state funding was appropriated for the WWAMI program. Hence, faculty development retreats and even associated program evaluation endeavors are subject to the scarcity of local resources and other competing needs (Plecki, Elfers & Nakamura, 2012; UWSOM Operating & Capital Budget, 2016). Present-day knowledge of available resources and their allocation is necessary to adequately substantiate, enact, and sustain new curriculum design measures, especially with consideration to what constitutes equity and continuity of educational experiences in a regional medical school's curriculum.

Even more, core operating expenses compete with student learning needs in medical education platforms; particularly, in orienting instructional improvements to meet learning demands associated with the growing diversity of populations and students. UWSOM has encountered challenges associated with the implementation of congruent instructional methods that maximize and invest appropriate resources over an expansive medical student population, since overhead expenses and "certain interests get an increasingly disproportionate share of given resources" (Plecki, Halverson & Knapp, 2014; McDermott, 2015). For example, WWAMI's main administrative staff and course leaders operate out of the program's "home" site: Seattle, WA. Seattle also has the largest student enrollment. This justifies the ample share of state funding for the WWAMI Program being appropriated to UWSOM. However, more rural sites, such as the University of Alaska or Montana State University, may have greater budgetary needs given their location, land mass and travel constraints. Therefore, curriculum renewal policies must account for contextual factors that substantiate differential investments and varying allocations of resources throughout the region; so that instructional objectives are feasible across sites, align with the development of culturally responsive instructional practices, account for

learning improvement priorities, and support equitable learning environments (Plecki, Alejano, Lochmiller & Knapp, 2006).

4.7 Summation of Findings

Overall, this six-component strategic approach to instructional policy highlighting UWSOM's curriculum renewal process, which was by many accounts successful (it happened, and the curriculum has been continually adapted to facilitate continuous quality improvement processes), addresses core instructional design elements advantageous for the construction of an innovative curriculum and progressive instructional practices. Further, UWSOM could have benefited from an explicit and well-propagated theory of action concerning major curriculum processes and milestones, and even more faculty development concerning integrated instructional design. Without a clear theory of action, these recommendations suffer with uncertainty as to how components influence and interact with each other, and apply in the creation of instructional policy throughout medical disciplines spanning a vast WWAMI region.

Further, any vagueness pertaining to these components' conceptualization in instructional formats offer no coherent model or understanding as to how the specific components account for variability among a large regional context. However, it is both a complex and difficult prospect to replicate successful instructional design policies at varying institutions due to differences in local contexts, fluctuating interpretations of good instruction, human capacities, and the availability of resources.

Nonetheless, my policy recommendations rely upon the following highlighted design components, and cumulatively offers insight into the importance of a clear theory of action and practices for embarking upon curricular reform:

1) the creation a shared vision of good teaching practice focused around the instructional core – content, faculty (quality of medical instruction specific to the

context), and specific student learning needs within the classroom (instructional targets);

2) provide professors and clinicians with integrated professional development opportunities to address and utilize variable capacities effectively, as well as promote accountability;

3) promote accountable practices (grounded by evidence via data gathering, interpretation, and inquiry methods) that assess instructional practices and measure student progress both prior, during, and throughout UWSOM's four-year medical curriculum to ensure subject matter expertise and identify opportunities for instructional interventions (especially in consideration of diverse, regional student population needs);

4) cultivate collaborative relationships among medical faculty in and across schools (UWSOM and WSU) to provide a rich research and extensive professional development network to maximizes human capacities, motivates and supports improvements in teaching practices, addresses variable capacity, and develops accountability strategies that perpetuate student growth and high performance on national licensing examinations;

5) utilize internal and external accountability systems that build constituency and craft explicit strategies that foster collective responsibility over instructional policy development and support continual instructional improvements; and lastly,

6) differentiate investments and allocations of resources to align instructional strategies that engage student participation in purposeful and inclusive learning activities, address equity in instructional design policy, and ensure that students have access and equal opportunities to participate in active learning.

Chapter 5: Part I

5.1 Discussion

Continuous calls for reform heightened by national dialogue about disparities and inadequate resources in the healthcare system, especially within the past twenty years with federal healthcare reform spanning from the Clinton Health Plan in 1993 to the Affordable Care Act in 2014 (a raging problem stream), have conjured more and more attention to the quality of medical education and training – particularly medical student competencies prior to the beginning of residency, post-graduate training (O'Shea, 2014). As political and social demands mount concerning healthcare, so have training requirements that aim to transform the methods by which medical doctors are educated. This is evident per the LCME's steadily increasing management of medical education curriculum and requisites for internal, continuous quality improvement measures evaluating programs' effectiveness since the early 1990s (Kassebaum, Culter & Eaglen, 1997; Bauchner, Fontanarosa & Thompson, 2015). Particularly, in the U.S. for over a century, several national AAMC reforms spawned by councils, committees and commissions have evoked changes in undergraduate medical education, i.e. medical school, largely impart by changes in medical practice, advances in research, and the role of the physician in modern society (See Appendix H). Further, the administration of healthcare has transformed along with technological discovery and advancements, including the inception of managed care and limited insurance plans that impose complex coding requirements needed for billing and reimbursements on a variety of clinical care procedures and/or hospital stays. Even more, interdisciplinary attitudes to research and public health have given rise to population and disease-centered centers, e.g. state health districts, centers for disease and control, cancer centers, diabetes clinics, etc.; all of which have influenced the organization of medical schools in terms

of basic science instruction, research, and the delivery of patient care (the major components that constitute academic medical centers, AMCs). Even with regard to the evolution of medicine, AAMC reforms and initiatives, scientific discovery, research, and technological advances have not yielded meaningful or sustainable change in medical education or its core organization (Davis & White, 2002). This has been largely attributed to the process of LCME accreditation (Christakis, 1995; Petersen, 1999; Boudreau, Jagosh, Slee, Macdonald, & Steinert, 2008; Eckel, 2008; Mehta, Hull, Young & Stoller, 2013; Brauer & Ferguson, 2015; Iglehart, 2015).

Accreditation bodies are organized to maintain quality assurance, and warrant consistency, improvements, and enhancements to medical education programs, and medical schools are evaluated by the LCME based upon three levels of criteria:

1) Institutional Strengths: Accreditation standards are notably exceeded.
2) Institutional **Noncompliance**: Accreditation standards are partially or substantially deficient.
3) Transitional: Accreditation standards are in compliance, but transitional issues raise concerns for potential risk for future infractions or **noncompliance**.

Accreditation is vital, for it determines eligibility for federal funding and grants, in addition to Title VII allowances per the Public Health Service. Hence, financial risks associated with a LCME "noncompliance" status serve as great motivators for addressing, mending and/or renewing institutional deficiencies. Yet more, LCME-accredited medical schools are the only institutions where graduates are afforded the opportunity to take the U.S. Medical Licensing Examinations (USMLE) necessary to fulfill national licensing requirements for medical licensure as a M.D. (LCME Accreditation, 2017). This is compelling. The purpose of accreditation substantiates the existence of medical schools, and therefore, it seems logical to attribute revisions to national LCME accreditation standards and elements as strong influencers for the initiation of medical educational reform and subsequently, medical schools' curriculum renewal proposals.

UWSOM's curriculum renewal objectives accentuate macro-level aims that constitute the parameters for what is considered "legitimate" for modern, medical education programs. That is, what is expected, suitable, and esteemed. In the realm of higher education in general, legitimation is associated with suppositions of what is valued and respected, e.g., research, as well as what is considered problematic and in need of improvement (Gumport, 2000). Application of Elmore's theory of core and periphery changes to the curriculum expounds upon this, exposing an explicit break between what is known and what is implemented. For example, in spite of national measures to implement and disseminate team-based learning approaches along with evidence-based practices for teaching and educational improvements over a period of thirty years (1987 to 2017), approximately only twenty-two (22) of the one hundred and fifty-two (152) medical schools in the U.S. have incorporated these practices into day-to-day instruction (Guilbert, 2001; Vioreanu, 2017). Case in point, UWSOM's renewal objectives devised during the visioning phase of the renewal project failed to account for UWSOM's five core educational **program** objectives: 1) provide publicly supported medical education; 2) increase the number of primary-care physicians; 3) provide community-based medical education; 4) expand graduate medical education, GME, (residency training) and continuing medical education (CME); and, 5) provide all of this in a cost-effective manner (UW Medicine, 2018). These program objectives are certainly context-oriented and facilitate the adaptation of curriculum along with advances in medical science (objective #5) and community health needs (objectives #1 and #3 particularly). This series of objectives invoked the sense that education inertia and resistances to reform or changes in curriculum are benign, for the curriculum is complete, continuous, and unbroken.

A distinct disconnect is apparent between the objectives envisioned for renewal purposes and UWSOM's longstanding educational mission. A mission that has remained largely intact

since the inception of the WWAMI program in the 1960s. (Schwarz, 2014). This suggest that perhaps resistance to curricular change is inherent to the organizational structure of medical education, or influenced by new standards as sanctioned by the LCME (Davis & White, 2002). Moreover, literature centered on emergent strategies and strategic planning postulates that it is not surprising to unearth incongruence among identified problems (and defined goals) and proposed changes (Harvard Business Publishing, 2008). This literature expounds that failure of reform is associated with sole reliance on strategic planning rather than reinstating core objectives constituting the necessity for reform, the process, and/or on anticipated difficulties facing implementation. Further insight notes the fallacy of dividing reform development, planning, and implementation stages (Mennin & Kaufman, 1989; Mintzberg, 2000). Reform plans should be cohesive throughout stages, especially in the planning and implementation stages, wherein the majority of barriers to reform efforts emerge.

But then, what accounts for the disconnect between educational improvements, which are devised and researched, but not widely adopted? Is extrication compounded by recurring pleas for education reform? Many studies examining national medical education reform measures focus solely on instruction and content – teaching methods, what is taught, incorporating community service, self-directed and lifelong learning methods, as well as centralization of the curriculum's implementation and administration, and faculty development (Christakis, 1995; Seifer, 1998; Lawley, Saxton & Johns, 2005; Mowery, 2015). This has bread objective-based curriculum development and outcome-based education measures. That is, curriculum reform places greater weight on competencies, course objectives, and defined learning outcomes, than on faculty development to propel and sustain renewal aims, instructional methods, outcomes, etc. (Harden, 2002; Prideaux, 2007; Shah, Desai, Jorwekar, Badyal & Singh, 2016). For example, the focus of renewal objectives to transition instructional practices to incorporate more case-based

(CBL) or team-based learning (TBL), but foregoing extensive faculty development to ensure the accurate transmittal of the basic tenets of CBL and TBL. Even more, ensuring that faculty are adequately equipped with sufficient resources by which to deliver and sustain CBL or TBL practices. Waiving faculty development or relying on faculty to foster divergent instructional practices serves as an obstacle to employing core instructional changes to core curriculum practices, and possibly the successful integration of content across disciplines and faculty collaboration. As a result, teaching formats tend to remain discipline-oriented and faculty regurgitate their knowledge, skills, and attitudes; which include their perceived notions of professionalism and communication. This is depictive of UWSOM's curriculum for the past twenty years. Luckily, UWSOM has recruited some of the best professors, physicians, and researchers in the country (Awards of Excellence, 2012). A curriculum program that has been heralded as one of the most innovative and progressive medical education training programs in the nation due to its continual growth and adaptation to changing needs of patients throughout the Pacific Northwest (UW Medicine, 2018). Further, UWSOM has been distinguished by the AAMC as an outstanding community-based program and recognized as the U.S.'s top "primary care, family medicine and rural medicine training school by the *U.S. News & World Report* for the past twenty-three years" (Long, 2017). So why modify a flourishing, progressive curriculum?

By all accounts, calls for reform have been deemed necessary and justified by the main governing body, the LCME, but the implicit importance of legitimacy engulfed UWSOM's curriculum restructuring process. UWSOM's departure from traditional instructional norms to its evolution as a curriculum renewal process, resulted in the amalgamation of existing courses to symbolize its reinvention, highlights the preservation of emblematic processes to signify legitimacy within the "institutional environment" (Meyer & Rowan, 1991). Even more, UWSOM employed common terminology throughout the restructuring process to sustain an

impression of legitimacy and maintain its institutional affluence and survival; e.g., careful attention to retaining common courses, processes, ceremonial formalities, and organizational roles under LCME standards and the watchful eye of competing institutions (e.g., Washington State University, WSU). This is precisely what John Meyer and Brian Rowan (1991) contend regarding the predisposition of organizations to common "vocabularies of structure" per institutional norms, which emphasizes the adoption of normative procedures, titles, and institutional roles to maintain legitimacy within the institutional setting regardless of the impact on efficiency or productivity. Meyer and Rowan explain that the acceptance and prevalent use of "vocabularies of structure" to preserve legitimacy in the organizational environment and support an institution's sustenance (p. 349). This concept is reinforced by David Tyack's and William Tobin's (1994) observations of legitimacy: "what legitimates an 'institutional organization' like a school or church is maintenance of ceremonial categories and processes" (p. 456). This is further advanced by Hans Weiler's (1984) theory of compensatory legitimization, which expounds upon the notion that if leaders' behaviors in establishing and implementing new educational policy in an organization is primarily influenced by concerns of maintaining, restoring, or salvaging legitimacy, then other motivations and objectives become far less significant (pp. 262-263).

Consistent with the foregoing, under the threat of perceived illegitimacy and pending reaccreditation, UWSOM retracted any drastic or revolutionary curriculum plans and reorganized its existing structure under preconceived expectations of revamped course content and instruction. The pressure to meet external norms and expectations may have placed relentless restraints on innovation of UWSOM's curriculum given the potential loss of legitimacy within its institutional context. Or further, national medical education aims to renew curriculum to keep pace with technological advances impacting the practice of medicine may have victimized an

existing curriculum that by all accounts was not considered broken or inadequate.

Academic medical institutions encounter increasing external pressures to maintain homogeneity and advancement, which is compounded by a governing body that encourages consistency and standardization. This can create an organizational dilemma. Great challenges exist in attempting to pioneer new medical education strategies and revolutionize curriculum models within an industry that is heavily reliant upon each other to maintain congruence, normalization, and homogeneity of educational practices and structures. With consideration to normative isomorphism and compensatory legitimization, groundbreaking medical education is subdued by constraints and pressures to conform to traditional forms of instruction, as well as maintain legitimacy as defined by national licensing and credentialing standards shared among premier medical institutions. Although medical schools by all evaluative accounts and intensive purposes have "reinvented" their medical education curriculum, they have been truly "rekindling" efforts under the scrutiny of milestones, competencies, and professionalism without attention to the system, economic constraints, and structures under which physicians learn, practice, and deliver healthcare.

Notwithstanding the theoretical notions of normative isomorphism and legitimacy on barriers to medical education reform, conventional structures and practices of medical education still endure. In examining medical education's lack of progress from the traditional structure and two by two format of medical education, distinct evidence illuminating variations in medical education across the nation, and over the past century, depict physicians overusing and misapplying a number of treatment and therapeutic modalities, ordering incorrect or unnecessary diagnostic tests, or neglecting to recommend prevention or treatment options that do not involve prescription drugs. While many of these variations in the delivery, quality, and efficacy of medical care is accredited to insufficiencies, shortcomings, and challenges associated with

medical education and related variables, the Flexner approach to medical education has endured and training of modern physicians has failed to adapt with the ever-advancing needs of society – from knowledgeable physician to clinical scientist (Wennberg, 2010; Birkmeyer, Reames, McCulloch, Carr, Campbell & Wennberg, 2013). Even the World Health Organization recognized this paradox back in 1972: "Medical education is inextricably tied to the healthcare system, and when questions arise about service, questions about education must follow" (Bloom, 2002). To faithfully execute on the promise of delivering skilled, widespread, and patient-driven healthcare, the structure of medical education must be adapted to meet ever-advancing times, and incorporate value into the doctrine of teaching and mentoring fledging medical students.

All of the research and reports referenced herein are based on the social mission of medical education and the medical profession, as well as UWSOM's educational mission, to train the best, most competent physicians and biomedical scientists who advance medical knowledge and patient care. This mission reflects important professional values and imparts the basis upon which subsequent aims and proposals for medical education reform arise. I postulate that reaffirmation of this mission and changes made without actual reform have continually served to legitimize the dated model of American medical education. Once the gap between the foundational basic science and clinical education subdivisions are perceived as having widened inordinately or insubordinately, an impetus to modify the structure and function of medical education may arise within the profession itself. Or, as disparities unremittingly increase disproportionate to what medical schools are intended to offer and what they are actually providing their respective communities, then this may espouse a realignment of public needs with medical education objectives and possibly spur state or federal funding incentives to align medical schools' educational purposes with the specific healthcare needs of their communities.

Nevertheless, as societal healthcare needs and demands change with the passage of time

and increases in biomedical discovery, the incentive to propagate reform proposals is interminably present. Neither shifts or reconfigurations of major financing sources or structures, perpetuating the idling state of medical education, have altered the problems associated with this phenomenon.

Overall, the findings suggest that although the curriculum is significant, the importance placed on curriculum renewal in order to keep pace with advancement, research, and medical innovation may be overestimated. Notably, the most susceptible approach to education reform is through the curriculum. (Again, the curriculum defined as the design and guided learning of a school. The major components of the curriculum are the infrastructure, teachers, and students.) The curriculum is often the first resort for educational reform since it is the most recognized and easily altered aspect of an educational institution (Kimberly & Evanisko, 1981; Davis & White, 2002; Hargreaves & Goodson, 2006; Densen, 2011). Douglas Ripkey's and David Swanson's research of student outcomes on national board examinations both prior to and after curriculum renewal interventions at prominent institutions (1998; 2013) note that "overall curricular approach may be less important than the quality of the curriculum implementation" (p.18). Both Ripkey's and Swanson's extensive investigation of curriculum renewal functions, spanning almost fifteen years, highlights faculty and modifications made to core instructional practices and learning objectives of greater importance than revisions in the format and delivery of curriculum. Ripkey and Swanson propose a shift from curriculum restructuring to faculty development as a means to impact core teaching methods and properly apply pedagogical approaches, such as problem-based learning (PBL). Hence, suggesting a clear distinction between the effectiveness of curriculum reorganization and core pedagogical techniques (Hecker & Violato, 2009).

Apart from curricular approach, curriculum renewal within the realm of medical

education is a constant process. (Many medical schools employ a continuous quality improvement, CQI, process that coincides with reaccreditation preparation.) Then why has the conventional structure and practices of medical education endured for more than one hundred years given major scientific discoveries and modern technological advances? I argue that the historical context and development of medical education and modern healthcare delivery systems play fundamental roles, and accounts of educational reform measures should incorporate thoughtful consideration of historical and political developments. For, I believe that the restrained evolution of medical education, and the healthcare system, is largely attributed to: 1) the formation of health as a fundamental human right; 2) the rapid advancement and industrialization of basic science knowledge and modern medical technology, particularly during World War II; and, 3) the overriding and competing interests of clinics and hospitals, doctors, state and federal governments, and governing bodies.

Chapter 5: Part II

5.2 Deliberating the Theoretical Framework – Multiple Streams Theory & UWSOM's Curriculum Renewal Process

John Kingdon's (1995) theoretical construct employing the concept of a policy window opening from the coupling of three policy streams provides great insight into the impetus for institutions' curriculum renewal plans. Kingdon explains that policy development is the result of three "streams" converging; that is, the effect of three processes developing independently of each other, but when coupled together bring about a policy window. The three streams consist of the problem stream, the politics stream, and policy stream. The problem stream pertains to matters that have become concerns. Although there are situations, conditions, and settings that could be defined as problematic, the problem stream refers to those matters recognized by major stakeholders, e.g. executives, administrators, national agencies, etc., to be precarious and resolvable via policy development and enactment. Prior to a problem being prioritized on a major stakeholder's decision agenda, a solution must be identified and congruent with the stakeholder's values, beliefs, and interests. The policy stream consists of such proposals, ideas, and schemes to address the problem. For example, UWSOM's executive leadership's attention to national medical education reform initiatives and trends for adopting a curriculum renewal process.

Although stakeholders, or major policymakers and/or politicians, may be preoccupied with a wealth of issues and concerns, they prioritize problems and policy solutions per the political climate of the current administration, scientific community, interest group campaigns, or at the climax of public issues bringing about outrage and/or national attention, etc.; and opportunely align with their own interests, perceived benefits, or profit. These groups comprise the politics stream and identify political issues on a macro-level (national climate, partisan

affairs, or civics) and/or a micro-level (institutional environment, organization culture, and/or time-honored processes.) Kingdon defines a policy window as a coupling of these streams whereby policy is abetted when a problem is recognized, a solution is readily feasible, and the political atmosphere is inclined to change. In application, this is symbolized by UWSOM's executive leadership's impetuous to initiate a curriculum renewal process adopting trends executed at other similarly-situated and prominent medical schools. The progression of policy is characterized by this constant change, activity, and progress along with many solutions hovering about. Many problems do not reach the main decision-making agenda, since they fail to be recognized as a major issue and the political climate is not well-suited for change. Hence, policy windows open intermittently and policy entrepreneurs (actors who use their knowledge of the process to further their own policy ends) must respond quickly as the problem, political and/or policy streams merge (Kingdon, 1984, 21). Policy entrepreneurs may be institutional leaders, lobbyists, politicians, researchers, leaders of public research institutions, public servants, or private citizens, and differ from decisions-makers in that policy entrepreneurs remain focused on their issues and formulate solutions. Even more, under Kingdon's analysis, these policy entrepreneurs pursue "softening up processes" to incite stakeholders to consider new ideas and/or plans (104). Thus, policy entrepreneurs' efforts may bring about both problem recognition, proposed solutions, and induce stakeholders' actions. In UWSOM's case, the absence of an internal communication system or a platform by which to readily relay renewal objectives, processes, plans of action, etc., may have hindered these efforts to relay proposed solutions and obtain buy-in from relevant mid-level professional staff and core faculty members.

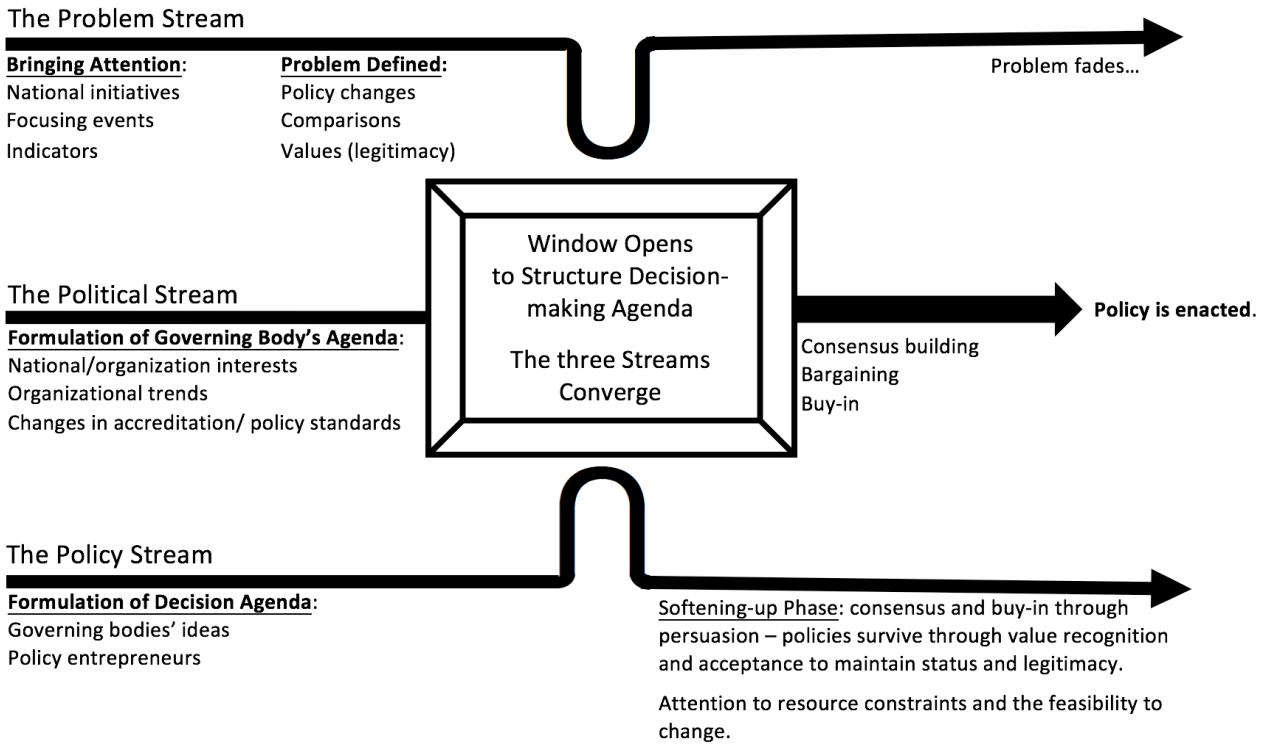
Kingdon (1995) expands upon the influence and role of policy entrepreneurs, which is applicable outside the traditional political arena. Policy entrepreneurs must be credible. That is, they are perceived as having the expertise and the aptitude to communicate or the authority to

make sound decisions for others. Additionally, policy entrepreneurs must possess an amalgamation of relationship-building tact and negotiation prowess. (What Kingdom explains as a combination of practical expertise and political proficiency along with a keen awareness of the political environment.) Most importantly, Kingdon adds that policy entrepreneurs are persistent and not easily deterred by civil or financial obstacles. Therefore, they are eager, willing, and able to promote their agendas/plans in several forms and venues, as well as devote many resources to endorse their policy ideas and solutions. UWSOM is nationally recognized by U.S. News & World Report as one of the best medical schools in the country, which is well-renowned and particularly enticing to prospective applicants, and has consistently received a large proportion of research funding from the National Institute of Health, NIH, amounting to almost half a billion dollars per year (U.S. News Report, 2016; Blue Ridge Institute, 2015). This enables UWSOM to continue and devote resources to research-oriented objectives, which add to its reputation as a forefront and international research institution (Institute of Translational Health Sciences, 2017).

Kingdon's multiple streams analysis is key to the study and understanding of policy development, and has been utilized in many conceptual frameworks for studies in policy development within a variety of disciplines including education and healthcare (Zahariadis & Allen, 1995; Laraway & Jennings, 2002; Blackman, 2005; Greathouse, et al., 2005; Ahearne, 2006; Koch & Ashford, 2006; O'Sullivan & Lussier-Duynstee, 2006; Odom-Forren & Hahn, 2006; Baum, Lawless & Williams, 2013). Kingdon's theoretical streams of policy development, policy window, and entrepreneurial concepts is fundamental in investigating the formulation of curriculum renewal efforts; particularly in national efforts commissioned by the AMA, governed by the Liaison Committee on Medical Education (LCME), and implemented at UWSOM to meet increasing standards of education for accreditation purposes since 2001.

Within the broad arena of policy development, influences and systematic indicators offer

a plethora of perspectives on the policy process, constituents, and potential outcomes. To adequately understand and conceptualize the prevailing conditions (economic, social, political, and cultural) and influence of key stakeholders in the creation and advocacy for curriculum renewal efforts, the multiple streams model and theoretical policy arena framework offer insight and exposure of policy components, stakeholders, political tools associated with the leveraging of resources, and assignment of culpability associated with a macro- and micro-level medical educational reform efforts.



5.2.1 Multiple Streams Analysis Expanded – UWSOM's Curriculum Renewal Process under the Constraints of Normative Isomorphism & Compensatory Legitimization

In the case of the UWSOM's curriculum renewal process discussed in 2009, initiated in 2010, and implemented in 2015, both the problem and policy streams merged during a climatic time, national attention of the dated medical education system (the indicator), and a plethora of

viable solutions to coax reform actions. The increasing focus of national medical education governing bodies, the LCME and the Association of American Medical Colleges (AAMC), created a policy window and afforded educational reform advocates (policy entrepreneurs) the legitimacy and prominence by which to pursue medical education reform efforts. Disparities in instructional content and student proficiency were forefront enough to provide opportunities for influential policy entrepreneurs to attach their solutions serving the respective interest of the governing education bodies, amid a stream of possible policy options aimed to improve medical student competency and health outcomes.

Even more, systematic indicators were identified and heightened by national attention of medical education's lack of progression with modern medicine and created universal acknowledgement of a problem and proposed solution – curriculum renewal. Policy entrepreneurs seized a window of opportunity, offered a wealth of solutions promoting their special interests and policy preferences, and collectively bargained to maximize and aggregate resources in the hope of reforming and improving medical education. An open call to all UWSOM faculty and students for curriculum renewal proposals was initiated school-wide on September 22, 2013 to aggregate and engage all stakeholders in UWSOM's curriculum renovation, no true mechanism was employed nor conveyed to participants regarding the proposal process or potential for implementation. Over fifty proposal were received by the Curriculum Office. The proposals bearing the greatest merit and prospect for implementation were presented at a faculty retreat in January 2014. (The selection process of the most promising proposals is unknown. There is no recorded or documented proof.) None of the proposals submitted were enacted de jure. However, it has been referenced multiple times by the Associate Dean of Curriculum and executive leadership that "aspects" of some of the proposals were adopted and enacted in the final planning stages of UWSOM's curriculum renewal, circa late

2014 (S. Allen, personal communication, March 16, 2016). Yet, the proposal measure can appear to those outside UWSOM's executive leadership arena as a clever strategy for cultivating faculty, student, and professional staff member buy-in under Kindgon's analysis. Kindgon would contend that the inception of this measure may have "softened up" collective stakeholders to utilizing policy entrepreneurs' (executive leaders') solutions at the regional and university-levels, and attempted to collectively formulate approaches and organize curriculum reform efforts as a whole. Of course, this is subject to speculation under Kingdon's theoretical lens and observation, and ultimately the strategy did not work. In the very end, many who participated viewed it as an exercise with little impact, largely given the vagueness of the process as described herein (C. Scott, personal communication, May 3, 2018).

Precedence incited by the culmination of main governing bodies' development of new education program standards (specifically the LCME and the Accreditation Council for Graduate Medical Education, ACGME), and expected student competencies created an arena shift in medical education. Prestigious tier-one institutions, identified in this analysis as having massive research funding and a reputation as one of the best medical education programs in the United States, began adapting programs to meet new standards and educational elements endorsed by the LCME and AAMC. What began as a subsystem-initiated "pilot" to reform medical education curriculum, throughout a select number of prominent schools, progressed into the development and reexamination of medical education standards acquiring macro-level attention and launching the importance of medical education curriculum reform as a major legislative agenda item (Blue, Garr, Del Bene & McCurdy, 2000; Josiah Macy Jr. Foundation, 2013; AMBiT Consulting, 2015; Long, 2015). The growing prominence of curriculum reform measures among prestigious medical education institutions influenced other schools' efforts to reassess their curriculum and instructional models as a means to maintain their institutional credibility and the legitimacy of

their educational programs (Bligh, 1999; Hunt, Migdal, Eaglen, Barzansky & Sabalis, 2012; Iglehart, 2015). So, what accounts for the resilience of outdated medical education models and practices in an educational environment propelled by the continual reassessment of education standards and continuous quality improvement measures inciting institutional changes in content, the format, and delivery of curricula?

Hans Weiler's (1984) theory of compensatory legitimation serves as a useful construct and instrument for analyzing medical education reform policies and practices that policy entrepreneurs utilized to advance curriculum renewal efforts through Kingdon's classical paradigm. Compensatory legitimation contends that the actions of a state, territory or organization in "setting and implementing of education policy is primarily determined by concerns with its own legitimacy, and with how to sustain, restore or regain it [and hence,] other motivations […] of necessity become less significant" (p. 34). Given this study, compensatory legitimation implies that medical education reform is influenced by the hegemony of highly esteemed medical education institutions, which define the standards, expectations, and place parameters on the format of medical education programs and curriculum. To meet and preserve a perception of legitimacy, medical schools maintain similar processes and structures to that of contextually comparable, renowned medical education programs. A concept defined in organizational theory as normative isomorphism, and more specific to education policy as "compensatory legitimation."

Weiler outlines compensatory legitimation using three major strategies: legalization, expertise, and participation. These strategies provide modes by which to exam the theory of compensatory legitimation using main indicators that comprise medical education curriculum. (The main indicators of medical education curriculum reform are operationalized as the following and aforementioned variables in Chapter 3, Methodology: goals/outcomes, methods,

content, and assessment/evaluation.) These main curriculum variables were measured by changes made in curricular program objectives, instructional method, format (move toward content integration) and delivery over time (2010-2014); as well as their impact on core and periphery impact on the renewal's medical educational practices upon implementation in 2015. Collectively, the variables were examined under the lens of Weiler's three major compensatory legitimization strategies and measured by longitudinal core and periphery changes to the curriculum. This resulted in findings concerning the: legalization/credibility of the program (the increasing role of prominent medical education programs in influencing overall medical education reform measures); expertise (the influence and status bestowed on reform decisions sanctioned by the experimentation and implementation of well-known medical education institutions; and participation (the shared involvement and understanding among all medical schools to maintain legitimacy by sharing similar curriculum formats, processes, and educational program objectives – an organizational model of normative isomorphism.)

The undergraduate medical education enterprise emphasizes congruence and standardization of fundamental course studies and instructional practices (Huerta, 2009). Institutional norms influence traditional methods of medical schooling and provide explicit guidelines for the structure of adequate and exemplary medical educational programs (institutional isomorphism and legitimacy). Any departure from these historical norms summons external criticism pertaining to the credibility and prestige of the program. Institutions do have the autonomy to establish their own operational policies, class sizes, qualifications of faculty and professional administrators, facilities, technological learning components, and instructional formats (LCME, 2017). However, medical institutions are obligated to meet medical education norms. Norms are often referred to as "best practices" and dictate the customary structure of medical training; e.g. two years of foundational science amounting to no less than eight hundred

hours of study dispersed among required coursework, ten-weeks of independent or bench research, and two years of clinical training as mandated by the LCME.

5.2.3 Implication of Elmore's Notion of Core v. Periphery Changes on UWSOM's Curriculum Renewal Sustenance

Buy-in is vital per Elmore's (1996) research pertaining to traditional school organizations and longevity impediments faced when attempting to execute far-reaching curriculum reform and adapt traditional structures to impact "core" educational conventions. Elmore's research unearths circumstantial evidence that U.S. schools and their practitioners/specialists are systematically incapable of integrating and broadening new instructional methods and learning practices beyond a small periphery of schools and teaching spaces due to entrenched traditions and a lack of incentive to change. As such, Elmore adds that deviance from established, stable patterns of instruction and the structure of schooling seldom change fundamental core practices. What results as "reform" is really nebulous modifications that are hardly, if not at all, impact core educational program practices/objectives. Therefore, even though medical schools may appear to be adapting and changing constantly – adopting new policies, schedules, textbooks, and/or content – there are no fundamental changes to core instructional practices or "what teachers and students actually do when they are together in classrooms" (p. 3). This could not be more pertinent to the structure and core educational practices among medical education institutions since the inception of the Flexnerian "2+2" model of education in 1920 (The Carnegie Foundation, 1910; Elmore, 1996; Guilbert, 2001; Mehta, Hull, Young & Stoller, 2013).

Moreover, the likelihood for curricular change oscillates according to the level that educational reform efforts target core, fundamental medical education structures and practices. At the very core of medical education lies the function of academic programs to produce competent twenty-first physicians. Elmore's research of educational reform efforts provides an

organizational perspective of the degree to which substantial, proposed changes to traditional educational structures and purposes impact the core and periphery of schooling. Elmore's studies reveal that reforms and reformers are far more likely to initiate and produce periphery changes rather than at the core of schooling (Elmore, 1996). Elmore explains that the capacity to execute upon intended and substantial changes to the core is inhibited by the ability of reforms to maneuver across levels of schools' hierarchies.

Even more, Elmore cites governance structures, consisting of policymakers, administrators, and practitioners equating to three levels of hierarchy, as essential in influencing educational reform and processes. According to Elmore and Milbrey McLaughlin[viii] (1988), there are three levels of hierarchy: 1) policymakers who initiate efforts and policy entrepreneurs who frame efforts for reform (UW Dean of the School of Medicine and CEO of UW Medicine); 2) chief administrators who organize and promote or hinder reform efforts (Vice Dean for Academic, Rural and Regional Affairs, Associate Dean of Curriculum, Director of Curriculum, Chief of Staff, etc.); and, 3) institutional practitioners who determine how to adopt, facilitate, and implement changes/improvements (faculty). Further, both Elmore's and McLaughlin's research contends that at each level of hierarchy these stakeholders are influenced by their own interests, socialization, and beliefs about educational structures, instruction, delivery of curriculum, etc. (Elmore, 1996; McLaughlin, 1990). Hence, epistemological differences in perspective and special interests or biases impede educational reform efforts from fluidly moving across the levels of hierarchy, which suggests that many reforms fail to revolutionize core educational structures or influence traditional instructional practices. Much like UWSOM's organizational

[viii] Milbrey McLaughlin is the Founding Director of the John W. Gardner Center for Youth and Communities and the Co-Director of the Center for Research on the Context of Teaching – the renowned interdisciplinary research center that studies the impact of teaching and learning within various organizational, institutional, and social-cultural contexts and availability of resources.

context, impedance to proposed changes in the core structure, function, and practice is only compounded by an education organization's complexity, communication, impediments, and resistance to change historic educational norms and customs. This complexity and resistance is often faulted and addressed per an amalgamation of addendums to traditional curriculum content. For example, to address modern medical practices and competencies, as well as offer greater academic enrichment, medical schools add (some even require) non-clinical elective courses to provide exposure to holistic patient care, evidence-based practices, interdisciplinary communication and lifelong learning skills, including other contemporary methods. These conventions are widely accepted outcomes of medical education reform and are attributed with producing satisfactory twenty-first century physicians (Hojat, Veloski, Nasca, Erdmann, & Gonnella, 2006; Newhouse & Spring, 2010). Per the scrutiny of Elmore's research, the addition of courses and supplementary content at the periphery level of curriculum reform serves as a single example of the resilience of core educational practices and structures within the context of what appears to be "constant institutional change" (Elmore, 1996). This is reminiscent of Boaden's and Bligh's (1999) findings of "reform by modest curriculum extension" (as cited in Spencer & Jordan, 2001).

Chapter 5: Part III

5.3 In Summation: Lessons Learned from UWSOM's Curriculum Renewal Process

By late 2009, UWSOM had embarked on a curriculum reinvention project focused on transforming teaching practices and integrating the basic sciences with applied clinical medicine due to the modern-day challenges presented herein. As time progressed into 2010, internal and external forces redirected what was intended to be an instructional redesign project into a full-fledged curriculum renewal process. Presently, the renewed curriculum is two and a-half years into the implementation phase. The clinical curriculum remains largely the same in terms of format, e.g. instruction, content presented, and teaching faculty; which is consistent with many other medical schools that have underwent curriculum renewal processes (Whitcomb, 2001 as cited in Greenberg, 2003; Abraham, 2013; Mcleod & Steinert, 2014; WWAMI Review Committee, 2014; Brauer & Ferguson, 2015). As discussed, applications of isomorphism and compensatory legitimization provide greater insight and possible explanation pertaining to the barriers associated with the stagnation of and impediments to the clinical phase of medical education reform given the economically and resource-constrained environment.

The great distinction placed on UWSOM's as a "pre-eminent [and regional] academic medical center" and "national leader in biomedical research," has fixated institutional attention on the delivery of exceptional education and training opportunities for future physicians and world-renowned scientists (UW Medicine, 2014). In order to propel and sustain this organizational mission, UWSOM promotes universal values that are shared among other prominent medical schools, the likes of Harvard, Stanford, and the University of California San Francisco; which alight staff, faculty, and all affiliated stakeholders' interests towards the improvement and sustainment of a progressive academic medical center and community. Hence,

the SOM's infrastructure, much like that of other external schools, aims for continual modernization and advancement by providing a scholastic environment filled with students, professors, and researchers that share the same attitudes embracing advanced instruction and innovation. Yet, true innovation at the core of instruction is somewhat constricted given that the main governing and credentialing bureau for medical education, the LCME, establishes and regularly revises national requirements that define expected institutional standards. These standards are notably cumbersome and require that each discipline, specialty, and sub-fields are distinctly specified and purposeful – this includes recommendations on the modes and methods of instruction, which are demarcated, and also massively adopted by the most prestigious medical institutions in the country. This presents great limitations to the development and implementation of new, truly distinctive and progressive medical education curricula. Even more, significant changes to medical instruction conjure unfavorable assessments by other industry leaders and hinder the development of new curriculum practices; for, any perceived departure from the historical methods ("standards") of medical education and training by other prominent medical education centers subjects an institution to questions of legitimacy as well as critical review of reaccreditation criteria under the LCME (a byproduct of Weiler's notion of compensatory legitimization). All of which, could reasonably threaten a progressive institution's status, student recruitment, and longevity, and places implicit parameters on truly innovative curriculum development as discussed under the analysis of compensatory legitimization.

Without needed medical education reform, divides between the basic science and clinical education phases of medical education programs will magnify and expand, and the existing distribution of quality healthcare and the inequitable access to healthcare will subsist. The U.S. population already suffers from an epidemic shortage of doctors and an even greater scarcity of specialty physicians. This is only compounded by the inaptitude of physicians to serve residents

of rural and isolated territories, since medical education and training is largely concentrated in urban teaching hospitals (or academic medical centers) and treat patients with distinctly different conditions than those who live in agrarian or indigent communities. The incongruity to meet the true healthcare needs of the whole population, especially those in most need, in what is considered the most progressive, civilized, humane, and expensive healthcare system in the world is not only negligent, but unjust. To maintain this prestige, the impression of legitimacy in the structure and purpose of medical education will not withstand expanding gaps in the delivery and quality of healthcare. Given the findings of this study, if we will fail to serve an ailing population, then we will most certainly unintendedly incur suffering upon other countries reliant upon our advances in biomedical science for their own progress.

The system of accreditation in medicine is accepted by major stakeholders across institutions, jurisdictions, borders, and the public. It is obligatory that cooperation between accreditation agencies and all involved stakeholders at the medical school level exist. Medical school relationships with the LCME must evolve in order to abate reservations associated with curriculum reform and increase confidence in revolutionary changes or adaptations to traditional medical education structures.

Through this study, several challenges were exemplified by a large institution undergoing reformation efforts. These challenges included issues/concerns associated with faculty buy-in, financial support, and weighing research and service purposes of a healthcare facility; which were only increased given the size and scope of the institution and reform measures. Lessons provided through this study note:

1. The balance between research and the delivery of quality healthcare (service) is essential for a reform's sustainability and continuity. For example, if an institution's reform endeavors focus on the delivery of healthcare (service) to the detriment of research, then

it subjects the institution to gaps or shortfalls in innovation or human capacity – placing the school at a competitive disadvantage in recruitment, loss of potential revenue, and/or threats to its perceived prestige and legitimacy as a forefront academic institution. Otherwise, if reform processes create an imbalance in favor of research, then the institution's delivery of healthcare (service) suffers at the expense of clinical revenue and to the detriment of patient care. This predicament supports the notion that medical education reform is entrapped by the provision of service (patient care) due to the urgency of patients' and institutional demands.

2. American medical centers' (AMCs') decisions must focus on the institution's priorities to sustain its existence and prestige as a forefront medical education program. This was acknowledged early by UWSOM's executive members as being essential and planning evolved as such with considerable attention to other esteemed medical programs. It also comprised the bulk of time committed to curriculum reform efforts. Planning efforts in the early stages of the curriculum reform (2010-2012) could have also been aided and abetted by the formulation of a strategic plan aligning the educational mission with research and patient care. Further, an approach like transformational planning (a component of change management whereby a strategic plan is created with the expectation of reworking organizational policies, procedures and processes), would have proved influential in designing curriculum reform measures befitting to the institution's existing values, culture, and history (Burke & Litwin, 1992; Burke, 2008). Given the diversity of stakeholders' interests, responsibilities, and capacities, as well as internal and external constraints, it should have been anticipated that discordance in opinions, attitudes, priorities, and purposes/roles of curriculum reform measures were going to arise. In this case, an adaptable strategic plan would have been beneficial in supporting,

progressing, and sustaining curriculum reform endeavors.

3. Communication is vital for organizational change, alongside explicitly delineated Strategic plans that are adaptable enough to facilitate reform measures in light of various stakeholders with diverging interests and outlooks. The fundamental importance of consistent, transparent, and informative communication from institutional leaders cannot be understated. This includes the formulation and development of readily accessible and unconcealed modes of communication on multiple delivery platforms.
4. Governance structures and leadership hierarchies vary across AMCs. UWSOM's shared leadership of the medical school and four teaching hospitals (under the leadership of Dr. Paul Ramsey, Dean of UWSOM and CEO of UW Medicine) affords both benefits and disadvantages. For, UWSOM's educational mission and vision is not conceded by the missions of their four major teaching hospitals; but a change of leadership (Dr. Ramsey's future retirement) could likely alter organizational dynamics and/or confidence in the education mission or projected shared vision for curriculum reform endeavors. Authority and confidence in leadership is fundamental for major change to occur, especially in reform planning and implementation. Even in times when trust is tested and compromised, or threatened via changes in leadership, the significance of producing and reinforcing evidence of change and progress cannot be underscored. Again, stressing the great importance of clear and consistent modes of communication that are corroborated with timely, objective, and peripheral evaluations of curriculum renewal progress. Punctual evaluations of renewal schemes, plans and objectives, as well as of designated leadership members provide opportunities for needed changes or adaptations in reform efforts and directions that only serve to support and aid the successfully implementation of curriculum renewal plans. Timely assessments of curriculum reform efforts also

provide unintended consequences, such as transparency and institutional accountability over the planning, implementation, and sustainability of curriculum renewal plans.

5. Lastly, academic medical centers will encounter challenges over the next decade given the lack of stability in government healthcare reform and partisanship that directly impact healthcare financing and reform; e.g., changes in Medicare and Medicaid provisions, reduced NIH funding for biomedical research, and the status of the Patient Protection and Affordable Care Act. It is possible that the structure and governance of AMCs will need to be adapted or developed to maintain their core educational missions bridging research, education, and patient care altogether. Institutional planning and leadership is crucial given these external influences and factors. A lack thereof could imbalance an institution's focus on both research and education, which could possibly impair an institution's national preeminence and reputation. Hence, AMC models will likely need to be reformulated or redefined in order to preserve the core and collective mission of research, education, and patient care, as well as ensure its longevity.

5.4 Recommendations for Future Studies

Medical education research aims to expand the understanding of learning processes and assessments by examining student cohorts, relationships between preceptors and apprentices, as well as instructional environments. Yet, understandably, much of the research in medical education is driven by financial incentive rather than actual scholarly interest, since endowments make up the bulk of funding for medical education research and donors want spending justified by the creation of innovative technologies instead of studies of new teaching methods or initiatives. As a result, there is a plethora of research in medical education that focuses on the role of interactive technology for instruction (Robin, McNeil, Cook, Agarwal & Singhal, 2011); the use of responsive mannequins to aid students in diagnostics and diagnosis (Sahu & Lata, 2010); voice recognition in new note-taking and charting devices (Torrieri, 2011); and even theoretical constructs of adult learning processes in the digital/information age (Siemens, 2013). Especially throughout the past decade, and arguably not since Flexner's Report, has there been a comprehensive research study on medical education that centers on the structure of medical education institutions throughout the United States under the governance of the LCME, the national authority on medical education requirements and licensing (The Carnegie Foundation, 1910). Prospective research could address how medical schools' organizational frameworks, the infrastructure of an organization and the relationships/relative ranks of roles and jobs, impact the development or adaptation of curriculum to meet ever-progressing standards of medical education under the LCME. Especially at a time when academic medical centers are gradually more reliant on research grants and subsidies, an absence of funding is appropriated for medical education research.

Additionally, research opportunities exist for exploring the practical relevance of medical education and the influence of traditional institutional models on the knowledge and structure of

medical education in an expansive digital age deeper (particularly whether or not institutions' traditional infrastructures impact the development and/or adaptation of curriculum and offer medical students the relevant knowledge and training to become competent physicians in an increasingly modern world).

Much of the existing literature and previous studies centering on medical schools focus on major challenges associated with developing and implementing innovative teaching practices, as well as the integration of creative planning strategies that facilitate instructional reform measures (The Lancet Commissions, 2010). Conferences sponsored by the Josiah Macy, Jr. Foundation have centered on the challenges associated with the development of new medical schools within the twenty-first century, but have neglected to evaluate how existing institutions' curriculum structures and time-honored practices impede innovative medical education plans (LCME Standards, 2013). Even more, a study formulated by researchers at the Yale School of Public Health references the need to reorganize organizational and clinical structures in medical schools, but primarily focuses on the impact of scientifically-based research methodologies on the stifling of any reformation efforts; not on ideas or proposals to address organizational impediments to curriculum reform or instructional innovation. Most notable however, is the study's application and recommendation for employing qualitative methods to attain a greater understanding about the development and evaluation of medical schools' organizational structures since, "governance tends to be more educationally conservative, perhaps it tends to reinforce departmental identity, exacerbate conflicts over 'turf,' and generate resistance to cross-disciplinary approaches" (Reynolds, Adler, Kanter, Horn, Harvey, & Bernier, 1995, p. 672 as cited in Davis & White, 2002). Existing literature in medical education fails to take into account the impact of governance structures and curriculum management frameworks on curriculum reform efforts aimed to keep pace with technological and medical advances. Since, the

preoccupation is on department-based research and clinical care practices necessary for patient care enhancements (Davis & White, 2002).

Medical research generates substantial revenue and economic growth, which casts a shadow over educational efforts that aim to change traditional curriculum structures or practices necessary for instructional improvement. It is notable, considering medical education's capacity to generate profits for federal and state public health research mandates, that there is a lack of research comparing medical institutions to large revenue-producing business enterprises. The importance of identifying and examining organizational structures and dynamics is abundantly stressed in business literature, especially pertaining to an organization's need to build an adaptable and cross-functional infrastructure that maximizes human capacity for longevity in a global economy (Densen, 2011). With a wealth of research and literature highlighting the vital importance of adaptable organizational frameworks on traditional decision-making hierarchies within the business community, there has yet to be a trail of directed studies on the impact of higher education's internal organizations on curriculum renewal efforts or in the development of new professional programs. An abundance of research in higher education stresses the importance of curriculum revitalization, yet minimal studies exist examining employees' (Deans, faculty and professional staff) roles and ranks on the implementation of curriculum-related reformation efforts (Densen, 2011; Ivankova & Stick, 2007; Davis & White, 2002; Tierney, 1988).

It is important to note limitations of research presently available, which is primarily concerned with student performance per variations in traditional curricula, structures, and content delivery. There are few longitudinal studies comparing institutions that have underwent similar curriculum changes/adaptations, and/or outcomes following implementations of curriculum changes over extended periods of time (Hargreaves & Goodson, 2006; Hecker &

Violato, 2009). More so, many studies pertaining to curriculum reform underestimate sustainability and liken it to maintainability in order to maintain credibility, as well as preserve their timelessness and application to future generations of learners (Hargreaves & Fink, 2004; 2006). As such, the sustainability of curriculum reform outcomes noting historical precedents and existing political climates, fail to take into consideration strategic planning for future student cohorts and iterations of the curriculum (Sarason, 1990; Tyack & Tobin, 1994; Hoban, 2002; Stein, Hubbard & Mehan, 2004). The focus of much of the research in curriculum reform center on the here and now.

An interesting take on future research could examine theoretical constructs grounded within social movement paradigms that form a strong basis for plan-of-actions associated with sustainable curricular change. Examples of effective social movement concepts include: grassroots leadership, tempered radicals, and social praxis. Grassroots leadership is entrenched in the social movement theory, and underscores the influence of the collective in challenging traditional power dynamics to initiate change. Throughout the years, educational institutions' lack of responsiveness regarding issues of social injustice have more often prompted students to take actions to initiate societal changes. In its most common form, grassroot efforts aim to countermand traditional power hierarchies via the collective assembly of the bourgeois. On university campuses, this has often materialized in the form of student protests, marches, and/or rallies to raise awareness of great social injustices, appeal for reform, or to cease warfare. The application of grassroots leadership provides an inexpensive means by which to empower individuals to build an expansive network of followers who unite in rousing consciousness about matters threatening the common good via word-of-mouth or social media platforms. The theoretical construct of a grassroot effort could be adapted to address grievances associated with traditional medical education structures as a means to incite, support, and sustain actions for

curriculum reform by core faulty members. This reframing of power dynamics applying grassroots leadership theory signals "consciousness-raising techniques" that evoke personal connections and promote the action of others in the mission or vision of the grassroot effort (Kezar, Gallant, & Lester, 2011, p. 133). Even more, these actions reinforce Lee Bolman's and Terrence Deal's (2013) political and symbolic frameworks of leadership. The political paradigm accentuates the importance of negotiating and bargaining with coalitions for the jockeying of resources and power. This area of leadership requires that leaders develop network strategies to transform a vision into reality, and leverages alliances and networks to gain access and input over institutional agendas. This is significantly leveraged with the use of symbolism to convey shared beliefs, purposes, and missions among diverse stakeholders that propel organizational missions and objectives focused on curriculum reform (Bolman & Deal, 2013).

Similar to grassroots leadership, the theoretical basis of tempered radicalism relies on a more overt, social change strategy accomplished by through action(s) of a single individual or leader. Elmore states that at any given instance, a wealth of notions exist about how to alter principle domains in the "core of schooling, some growing out of research and […] some growing out of teaching practice" (Elmore, 1996, 4). Yet, Elmore expresses that the problem "scale" (institutional hierarchies, the relative rank and role of stakeholders) is not reliant upon the acts of many, or on defiance or deficiencies in schools that impede the adoption of change. Actually, medical schools relentlessly undergo assessment and continuous quality improvement measures – embracing new approaches to teaching and learning, new curricula, scheduling changes, and an endless number of other modifications. Hence, although change is explicit at the periphery of schooling, the basic tenets of knowledge delivered at the core classroom-level by teachers to students which accounts for why learning remains static, or in a state of **equilibrium** with **punctuated** fluctuations in methods of instructional practice or structure. These punctuated

ebbs and flows in instruction and practice occur when notions and actions pertaining to curriculum reform arise.

Tempered radicals are defined as "individuals who identify with and are committed to their organizations, and are also committed to a cause, community, or ideology that is fundamentally different from, and possibly at odds with the dominant culture of their organization" (Meyerson & Scully, 1995, p. 1586 as cited in Kezar, et al., 2011). Radicalism compliments grassroots leadership, for each of these theoretical concepts share a movement towards collective action that challenges prevailing principles and/or practices, and is comprised of individuals positioned outside the hierarchical power structure of an organization. However, the tempered radical approach uses an individual leader with a well thought-out and tactful approach that aims to facilitate change that matches the individual's personal values and beliefs. Perhaps the utilization of a leader with a less "tempered" approach could incite collective backlash, depictive of tempered radicalism, in traditional medical education structures and content formats that advocate and foster "incremental and often subtle actions to foster change" (Kezar, et al., 2011).

A third concept of social movement theories is social praxis, which recognizes student agency as the way students structure and make sense of their institutional and social environments. The theory of social praxis contends that repression or shortcomings are remedied through the "self-identification" and "self-determination" of those oppressed or disadvantaged (Maldonado, Rhoads, & Buenavista, 2005, p. 613). Further, by fashioning their own social praxis contrary to institutional norms, students begin a process of combating forms of alienation or limitations inherent in the institution's history and culture. Minority student protests and outcries on social media (social movements) are the most recognized representation of students' shift in social praxes. This shift emphasizes empowerment and students' identification as active agents

of change when it comes to institutional norms, customs and practices, regardless of in-seniority, low socioeconomic status, and overall lack of power given the institution's internal hierarchy. The theoretical construct of social praxis has substantiated endorsements for the incorporation and encouragement of multicultural and diversity-oriented experiences in medical school curriculum (e.g., cultural competency modules, sociocultural implications on physical examinations and history-taking, etc.) (Maldonado, Rhoads & Buenavista, 2005). Student initiated and substantiated calls for curriculum reform on a micro- or macro-level could incite the opening of a policy window (as described by Kingdon's analysis of policy formation) to leverage the encroachment of politics (the political stream) upon the policy stream to address the feasibility and necessity of core medical education reform efforts.

Hence, an overlooked aspect of medical education research exists within the realm of current practices and medical schools' organizational infrastructures, which are widely shared among institutions throughout the nation and governed by the LCME. Given this void, the purpose of this research was to gain further insight and a greater understanding about the framework of a medical school's internal organization (herein referred to as the "structure"), which significantly impacts the format and function of medical education. Or more specifically, the influence of medical schools' basic, underlying personnel frameworks on the development, adaptation, delivery, or perpetuance of curriculum (an aggregate of courses and program requirements constituting a medical specialization degree) at institutions varying in national rankings and federal funding levels – all of which seem impervious to experimental change.

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APPENDIX A

Detailed Studies and Reports of Medical Education Reform Initiatives

Detailed Field Studies	Reform Initiatives – Councils, Committees & Commissions	Reports
1904-1906	AMA Council on Medical Education inspection of medical schools	*Council on Medical Education Report – 2nd Annual Conference*
1909-1910	AMA Council on Medical Education inspection of medical school: Abraham Flexner accompanied by N.P. Colwell, Secretary of the AMA Council	*Medical Education in the U.S. and Canada*
1934-1936	AMA Council on Medical Education	*Medical Education in the U.S.*
1947-1953	AAMC and AMA Council on Medical Education Committee	*Survey of Medical Schools in the U.S. at Mid-Century*
1924-1932	AAMC Commission on Medical Education	*Final Report of the Commission on Medical Edu.*
1958-1959	Surgeon General's Consultant Group	*Physicians for a Growing America*
1964-1965	AAMC study conducted by Lowell T. Coggeshall	*Planning for Progress through Medical Education*
1963-1966	AMA Council on Medical Education	*The Graduate Education of Physicians*
1967-1970	The Carnegie Commission on Higher Education	*Policies for Medical and Dental Education: A Special Report and Recommendations*
1971-1973	National Board of Medical Examiners Committee on Goals and Priorities	*Evaluation in the Continuum of Medical Education*
1979-1982	AMA Council on Medical Education	*Future Directions for Medical Education*
1981-1984	AAMC Panel on the General Professional Education of the Physician and College Preparation for Medicine	*Physicians for the Twenty-First Century: The GPEP Report*
1988	Macy Conference on Clinical Education and the Doctor of Tomorrow	*Clinical Education and the Doctor of Tomorrow*
1990-1992	The Robert Wood Johnson Foundation Commission on Medical Education	*The Sciences of Medical Practice: Environment for Learning*
1990-1992	The Pew Health Professions Commission	*Healthy America: Practitioners for 2005*
1995	The Pew Health Professions Commission	*Health Professions Education for the Future: Schools in the Service of the Nation*
2001	The Institute of Medicine's Committee on the Health Profession Edu. Summit	*The Chasm Report*
2010	The Lancet Commission	*Medical Education for the 21st Century*

APPENDIX B

Number of Liaison Committee on Medical Education (LCME) Standards cited in Five (5) Main Categories

		Categories of Standards and # of Citations in Each						
Study Period	**# of Medical Programs in Noncompliance/ transitional status**	**Institutional Setting**	**Educational Program for the MD Degree**	**Medical Students**	**Faculty**	**Educational Resources**	**Total**	**Descriptive Statistics for Total # of Citations**
Period (1996-2001)	46	42	119	83	42	78	364	Mean: 7.9; Median: 7.0; SD: 4.7 (1-25)
Period 2 (2004-2009)	60	18	248	134	40	61	501	Mean: 8.4; Median: 7.5; SD: 5.0 (0-19)

The number counts refer to medical education programs that received "severe action decisions" by the LCME in the period before 1996 (Study Period 1) and after 2009's (Study Period 2) revisions to exisiting accreditation standards. Severe action decisions are defined as puniative noncompliance/transitional citations resulting in follow-up action that is more critical than a status report/updates, which consist of: 1) limited, fact-finding survey visits; 2) changed and undetermined accreditation status; and, 3) recommendation for probationary status and denial of accreditation for applicant programs.

APPENDIX C

Structure of UWSOM's Curriculum following the Implementation of Renewal Plans

Foundations Phase:

UW Medicine
SCHOOL OF MEDICINE

E-16

Academic Year 2016 – 2017
Autumn, Winter, and Spring Quarters
Phase 1: Foundation

Length	2 wks	9/6-10/21, 2016	3 day	10/25-12/9, 2016	1 wk	2 wks	1/3-3/10, 2017	1 wk	1 wk	3/27-4/14, 2017	4/17-5/26, 2017	1 wk	1 wk
Block	Foundation of Clinical Medicine: Clinical Immersion & Orientation, Sea. 8/22-9/2	**Molecular & Cellular Basis of Disease**	Break (Sat. 10/22- Mon. 10/24)	**Invaders & Defenders**	Electives and Reassessment, if needed (12/12 – 12/16/16)	Winter Break (12/19 – 1/2, 2017)	**Circulatory Systems (CPR)**	Spring Break (3/13-3/17)	Electives & Reassessment, if needed 3/20-3/24/17)	**Blood & Cancer**	**Energetics & Homeostasis**	TBD	Electives and Reassessment, if needed (6/5 - 6/9/2017)
Content		• Cell Physiology & Function • Genes, Molecules, and Signaling • Genetic Diseases		• Immune System • Microbial Biology • Infectious Diseases • Inflammation & Repair • Skin			• Cardiovascular System • Respiratory System • Renal-Urinary System • Multisystem Fluid Balance			• Cancers • Heme/Lymph	• Metabolism & Nutrition • Obesity & Diabetes • Gastrointestinal Physioloy • Endocrinology		
Integra-ted with Course Content		Human Form & Function* Pathology/ Histology Pharmacology Epi/Biostats		Human Form & Function* Pathology/ Histology Pharmacology Epi-Biostats			Human Form & Function* Pathology/ Histology Pharmacology Epi/Biostats			Human Form & Function* Pathology/ Histology Pharmacology Epi/Biostats	Human Form & Function* Pathology/ Histology Pharmacology Epi/Biostats		
		Themes**		Themes**			Themes**			Themes**	Themes**		
		Foundations of Clinical Medicine***					Foundations of Clinical Medicine***			Foundations of Clinical Medicine***			

*HFF will include: Dissection, Prosection, Ultrasound, Embryology, Imaging, Surface Anatomy
**Themes will include Three Groupings: Health & Society, Evidence-Based Medicine, and Humanism & Medicine
***Foundations of Clinical Medicine will include: Primary Care Practicum, Clinical Skills, and College Tutorials.

Patient Care & Exploration & Focus Phases:

UW Medicine
SCHOOL OF MEDICINE

Academic Year 2019 - 2020
Phase 3: Explore and Focus
4/1/2019 – 5/22/2020

E-16

Length	4 Weeks	4 Weeks	4 Weeks	1 wk	40 Weeks	4 Weeks
Block	Advance Inpatient Care (Sub-Internship)	Emergency Medicine	Advanced Outpatient Care	Intersession (6/24-6/28, 2019)	*Clinical electives: • Five 4-week blocks of required electives. • Additional time for research, board preparation, residency interviews, etc.	Transition To Residency

*The order of the blocks are interchangeable with the exception of Intersession and Transition to Residency.

Approved UW SOM Curriculum Committee 022916

APPENDIX D

UWSOM's Curriculum Renewal Objectives and 2014 LCME Accreditation Standards – Coding

IS-1
IS-5 and FA-8
FA-13 and FA-14
ER-9 and ER-10
IS-4
IS-3
IS-7
IS-10
IS-8 and IS-9
IS-11
ED-39 and ED-40
ED-41
ER-8
IS-13 and IS-14
IS-16 and MS-8
MS-31
MS-31-A
MS-32
FA-2
FA-5
FA-7 and FA-9
FA-10
ED-30, FA-4, FA-11
FA-12
ER-2
ED-36
ER-3
ER-4
ER-6
ER-7
ER-5
ER-11 and ER-12
ER-13 and ER-14
MS-12
MS-37 and ER-7
ED-9, ER-1, ER-9
ED-1-A and ED-3
ED-2
ED-5-A
ED-16
ED-18
IS-14-A
IS-12
ED-4
ED-10 and ED-11

ED-10, ED-13, ED-14, ED-15
ED-12 and ED-17-A
ED-6
ED-20
IS-16, ED-21, ED-22
ED-23
ED-19
ED-19-A
ED-33
ED-1
ED-34, ED-35, ED-37
ED-46
ED-47
ED-2
ED-8
ED-38
ED-24
ED-25
ED-25-A
ED-26, ED-27, ED-28
ED-32
ED-29
ED-31
ED-30
ED-42 and MS-34
MS-1 and MS-2
MS-4 and MS-7
MS-3, MS-11, MS-33
MS-5, MS-6
MS-9
MS-10
MS-13, MS-14, MS-15
MS-16, MS-17
ED-43
MS-18
MS-19 and FA-6
MS-20
MS-22
MS-35
MS-36

Key	Topics
ED	Educational Resources and Infrastructure
ER	Curricular Management, Evaluation, and Enhancement
FA	Faculty Preparation, Productivity, and Policies
IS	Leadership and Administration
MS	Competencies, Curricular Objectives and Design

APPENDIX E

Timeline and Documents reviewed pertaining to UWSOM's and the WWAMI Program's Curriculum Development (1847-2014)

Pre-1920s	
Date	**Milestone**
May 7, 1847	American Medical Association (AMA) founded in Philadelphia, Pennsylvania.
March 12, 1853	Washington Territory created by U.S. President Millard Filmore.
December 1860	Seattle chosen as site of new University of Washington
November 4, 1861	University of Washington (UW) opened in Seattle with one student and one professor, Asa Mercer, who was also its President.
July 4, 1863	Idaho Territory created.
1867-1869	UW closed for lack of students.
	[1863: alternative date of UW's closure for lack of students.]
August 1874	UW closed part of the year due to lack of funds.
	1867: alternate date of UW's closure due to a lack of funding.
May 1876	UW graduates first student: Clara Antoinette McCarthy Wilt, Bachelor of Science.
February 1878	Washington Territorial Governor, Alexander Jay Anderson, made first attempt to start a medical school. Legislature authorized medical school, but failed to appropriate money.
July 1884	UW President, Leonard Powell, initiated second attempt to begin a medical school. The effort was authorized by the territorial legislature, which failed yet again to appropriate funds to cover basic operating expenses needed for the medical school.
January 30, 1889	University of Idaho established in Moscow, Idaho.
November 8, 1889	Montana became the 41st State in the Union.
November 11, 1889	Washington became the 42nd State in the Union.
March 28, 1890	Washington Agriculture College and School of Science (future Washington State University) was created in Pullman, WA.
October 3, 1892	University of Idaho opened.
February 16, 1893	Montana College of Agriculture and Mechanical Arts established in Bozeman, Montana. *Later renamed Montana State College before becoming Montana State University.*
April 1895	UW Board of Regents commissioned a report on the feasibility of beginning a medical school to be done by E.P. Mitton, a member of the Board. Hos conclusion was: "at this time."
July 1895	UW moved to new location north of Lake Union from original downtown Seattle tract.

June 1897	The Association of American Medical Colleges (AAMC) founded.
June 1898	Gold discovered in Alaska!
1904	American Medical Association (AMA) established the Council on Medical Education (CME).
February 1906	First Council on Medical Education inspection of U.S. and Canadian medical schools by the Carnegie Foundation of Teaching and Learning is commissioned by the American Medical Association (AMA).
January 1907	Children's' Orthopedic Hospital established in Seattle; becomes Seattle Children's' Hospital.
June 1909	Alaska-Yukon-Pacific Exposition held on the UW campus.
September 1910	*The Flexner Report* on medical education in the U.S. and Canada is published.
March 1905	First survey of hospitals for training interns (residents) in the U.S. is conducted.
August 24, 1912	Alaska Territory established.
November 1916	UW President Henry Suzzallo made fourth attempt to initiate a School of Medicine for the State of Washington.
May 1917	Alaskan Agriculture College and School of Mines incorporated in Fairbanks, Alaska. This institution later became the University of Alaska.
July 1919	"Essentials for Approved Internships" established in the U.S.
October 1920	The "Flexnerian" approach is widely-accepted and propagated as the American norm for medical education.
1927	Approval of hospital-based residency programs began in U.S.
March 1928	"Essentials for registered hospitals and for Approved Residencies and Fellowships" established in the U.S.
May 1935	The Alaskan Agriculture College and School of Mines collectively renamed the University of Alaska.
1940 – 1969	
Date	**Milestone**
1942	Liaison Committee on Medical Education (LCME) founded by the American Medical Association (AMA) and the Association of American Medical Colleges (AAMC).
February 1, 1945	Senate Bill #15 passed by Washington State Legislature authorizing creation of medical and dental school at the UW.
March 1, 1945	Washington State Governor, Maynard C. Walgren, signed Bill #15 creating medical and dental schools at the UW.
March 17, 1945	Edward Turner, MD appointed first Dean of the UW School of Medicine (UWSOM).
October 2, 1946	First class of 50 students enters UWSOM.

December 5, 1946	UW President Sieg appointed to the Board of Health Sciences with UWSOM Dean Edward Turner, MD as the Chair.
March 5, 1947	Site for the UW Health Sciences Center breaks-ground.
August 16, 1947	Children's Orthopedic Hospital's Board approves teaching affiliation agreement with the UWSOM.
September 1, 1948	Charter class begins clinical clerkships at 3 local hospitals.
October 1949	First accreditation visit by the Liaison Committee on Medical Education results in approval of the UWSOM as the U.S.'s 72nd school of Medicine.
June 1950	Graduation of UWSOM's charter class.
April 1951	First operation of Intern Matching (Residency) Program.
November 1951	Western Interstate Compact for Higher Education (WICHE) established.
December 1951	State of Montana joins WICHE Compact.
September 20, 1951	UWSOM students begin surgery rotations at the recently opened Seattle Veterans' Administration Hospital.
April 1953	UW Dean, Edward Turner, resigns; replaced by Acting Dean, James J. Haviland.
May 1953	Idaho joins WICHE Compact.
September 1954	George N. Aagaard, MD appointed second Dean of UWSOM.
May 1955	The State of Washington and Alaska join the WICHE Compact.
September 1956	Education Committee on Foreign Medical Graduates (ECFMG) established.
June 12, 1956	Site for UW University Hospital breaks-ground.
June 1958	Two-year integrated training program for Family Practice approved by American Medical Association (AMA) House of Delegates.
January 25, 1958	Charles E. Odegaard, PhD accepts Presidency of the UW, effective 08/01/1958.
August 29, 1958	President Odegaard visited Washington State College (WSC) and its President, Clement Finch to discuss new medical education site in Pullman, Washington.
March 1959	Washington State College (WSC) renamed as Washington State University (WSU).
September 1, 1958	Four months before Alaska becomes a state, UW's President Odegaard and WSU's President Finch join 50 businessmen for visits in cities throughout Alaska.
January 3, 1959	Alaska added as a State to the Union.
May 4, 1959	UW's University Hospital opens.
May 13, 1905	William R. Wood, PhD appointed as the President of the University of Alaska.

July 24, 1961	President John F. Kennedy's invitation to "all nations to participate in a communication satellite system in the interest of world peace and closer brotherhood of the world."
January 7, 1963	Statement issued by Presidents of Colleges and Universities in Washington State declaring that junior and community colleges were part of the network of higher education in the State of Washington.
October 23, 1963	Following the "Swept Wing Conference," which focused on medical education, the Medical School Executive Committee declared that a major curriculum reform was necessary.
May 17, 1905	The Faulkner Report, *Medical Education Options for Montana,* concluded that the State could not support a free-standing medical school and that a four-state medical school for "have not" states (Idaho, Montana, Nevada, and Wyoming) should be established under the auspices of the WICHE Compact.
July 1, 1964	John R. Hogness, MD appointed as the 3rd Dean of the UWSOM.
December 11, 1964	Report from the *President's Commission on Heart Disease, Cancer, and Stroke* recommends the establishment of Regional Medical Programs, RMPs.
February 1965	John N. Lein, MD appoints an Assistant Dean for Continuing Medical Education, CME.
April 1965	First Continuing Medical Education (CME) circuit course on advances in genetics (Professor Arno Mutulsky), obstetrics and gynecology (Professor Charles Hunter), and pediatrics (Professor Timothy Oliver) conducted in 8 cities throughout Washington State.
April 19, 1965	The Coggestall Report, *Planning for Medical Progress through Education,* released by the Association of American Medical Colleges, AAMC.
August 1965	The UWSOM Executive Committee accepted Charles Hunter's Committee Report suggesting major curricular revision and training in family medicine be established. Dean Hogness appointed a "Curriculum Change Committee, CX3," Chaired by John Sherris, MD to define changes needed in the curriculum.
July 1, 1965	Montana State College renamed to Montana State University.
August 1, 1965	Ernest W. Hartung, PhD appointed as President of the University of Idaho.
January 1966	Millis Commission Report, "The Citizens Commission on Graduate Medical Education," released by the American Medical Association. Charles E. Odegaard, UW's President, was a member of the committee that recommended new training programs for primary care physicians.

March 1966	First Continuing Medical Education (CME) circuit course outside Washington State, on cardiovascular disease, presented in Lewiston, Idaho by Professors John Blackmun, David Dillard, and Robert L. Van Citters.
May/June 1966	Folsom Report, "Health is a Community Affair," released by the National Commission on Community Health Services.
September 1966	Willard Report, "Ad Hoc Committee Report on Education for Family Practice," released by the American Medical Association.
November 1966	Mountain States RMP (MSRMP comprising of Idaho, Montana, Wyoming, Nevada) established headquarters in Boise, Idaho.
January 1967	Washington/Alaska Regional Medical Program (W/ARMP) established.
June 1967	Idaho legislature authorized a "Study and Plan for Developing a Graduate School of Medicine in Idaho." The Report (1969) concluded that Idaho could not afford a state medical school.
September 1967	WICHE Conference on "Medical Education in Sparsely Settled States," by Darley Plan, endorsed by Ward Darley, MD, envisioned a (joint) cooperative medical school among those states without.
February 24, 1967	Glenn Terrell, PhD appointed President of Washington State University.
May 27, 1967	A Communities of Excellence (CX3) Committee's Subcommittee on Primary Care, chaired by Wilbert E. Fordyce, MD, proposed the establishment of a Department of Family Medicine at UWSOM.
June/July 1967	UWSOM's Office of Research in Medical Education established with Charles W. Dohner, PhD as its Director.
November 1967	Report of the National Advisory Commission on "Health Manpower" published.
February 1968	UWSOM Department of Internal Medicine established the Guest Residency Program: two month rotations in seven hospitals located throughout Washington State and Alaska.
June 1968	Dean John R. Hogness spends two weeks in primary care practice at Omak, Washington's clinic while Omak Family Physician, Amos P. Bratrude, goes to UWSOM.
July 1968	M. Roy Schwarz, MD appointed the UWSOM's Assistant Dean for Admissions, and initiates visits to northwest (regional) universities.
August 1968	PL #90-490, the Health Manpower Act, passed by U.S. Congress focused on the need for more physicians.

December 1968	The CX3 Committee Report was adopted, which recommended: 1) an organ-system based curriculum to be developed; 2) a Department of Family Medicine be established; and, 3) the last two years of medical school to offer four "pathways" of study (emphasis) to medical students. Medical education reforms initiated as UWSOM.
January 1969	Montana Medical Education and Research Foundation (MMERF), representing seven health professions, was created. MMERF became an adviser to government agencies and officials on medical education.
February 1969	American Board of Family Practice established. (This was the first specialty board to certify primary care physicians.)
August 31, 1969	John R. Hogness resigned as UWSOM Dean and August G. Swanson, MD, an Associate Dean, was appointed Acting Dean of UWSOM.
September 1969	General outline of the WAMI concept proposed as an "experiment" in medical education.
1970	
Date	**Milestone**
January 01, 1970	Robert L. Van Citters, MD appointed four Dean of UWSOM.
February 13, 1970	August G. Swanson stepped-down as UWSOM Acting Dean, and later became Vice President for Academic Affairs for the Association of American Medical Colleges.
April 3, 1970	First general announcement of WAMI Concept.
April 11 - December 1970	Pack Forrest Faculty Retreat, with Congressman Tom Foley, focused on "How to Regionalize Medical Education." At this retreat, M. Roy Schwarz, MD made first formal WWAMI presentation to faculty.
May 1970	First request for a proposal to establish a family medicine community clinical unit in the Community Phase of the WAMI Concept sent to primary care physicians throughout Washington State. Sis total proposals returned from twenty-one physicians.
May 12, 1970	MMERF-sponsored "Seminar on Medical Education in Montana" held at Great Falls College in Great Falls, MT. WAMI proposal focus of meeting.
June 1, 1970	Robert Heskett appointed Coordinator of Medical Education in Inland Empire (Spokane, WA region).
June 5, 1970	M. Roy Schwarz, MD made first WAMI presentation to UWSOM's Medical School Executive Committee (MSEC)>
June 1970	Mountain States Medical Societies meeting held in Cheyenne, Wyoming where the Weston Plan was unveiled and where Assistant Secretary for the national Health, Education & Welfare Department, Roger Egeberg, MD, endorsed the decentralization of medical education for those states without a medical school.

June 1970	Carl W. McIntosch, PhD appointed President of Montana State University.
July 1, 1970	Department of Family Medicine created a Division of Ambulatory Medicine with Findlay Wallace, MD as Director.
July 1, 1970	Division of Family Medicine created at UWSOM, reporting to UWSOM's Dean.
July 1970	American Board of Medical Specialties reorganized as the American Board of Medical Specialties, ABMS.
August 1970	PL #90-490, the Health Manpower Act, became law with an emphasis on primary care and regionalization of healthcare resources, new construction, and new workforce utilization including nurse practitioners.
September 1, 1970	Theodore J. Phillips, MD appointed Director, Division of Family Medicine at UWSOM.
September 3, 1970	August G. Swanson, MD and Theodore E. Morgan, MD held first discussion with University of Alaska officials about the University Phase of WAMI being at their institution.
September 4, 1970	Dr. August G. Swanson, MD and Dr. Theodore E. Morgan, MD held discussions with Council of the Alaskan Medical Research Foundation (extension of the Alaska State Medical Association) about WAMI. The Council subsequently endorsed the concept as did the State Association.
September 1970	Howard Report: "A Bicentennial Anniversary Program for the Expansion of Medical Education" was published.
September 15, 1970	Roger L. Bennett appointed Long Range Planner for Health Services.
September 19, 1970	Montana Medical Association (MMA) endorsed decentralized medical education programs, such as WAMI for Montana.
September 21, 1970	UWSOM's Department of Internal Medicine Committee recommends the revolutionary restructuring of residency training, which includes significant increases of time in ambulatory settings.
October 1970	Carnegie Commission Report, "Higher Education and Nation's Health Policies for Medical and Dental Education," (referred to as the Kerr Report) published. Recommendations overlapped extensively with the WAMI Concept.
October 13, 1970	Montana Medical Association (MMA) via the Committee on Continuing Medical Education (CME) and House of Delegates (HOD) endorsed the WAMI Concept.
December 3, 1970	UWSOM accepted proposals from Omak, WA (by Phil Cleveland, MD) and Grandview, WA (Richard Layton, MD) to establish the first WAMI community clinical units (Community Phase) in family medicine.
December 4, 1970	M. Roy Schwarz, MD appointed Associate Dean of UWSOM and the Founding Director of the WAMI Program.

December 8, 1970	UW Press Conference held to announce the initiation of the WAMI Program. Press Release by Commonwealth Fund announced $996,678 grant to start the program entitled: "Regionalization of Medical Education in the Pacific Northwest." Foci: University Phase (University of Alaska) and Family Medicine Community Clinical Units (FMCCUs) in Omak and Grandview, WA.
December 14, 1970	Regents of Montana University System support WAMI Concept.
December 29, 1970	Montana Governor, Forrest Anderson, appointed "The Medical Education Planning Committee" (Meloy Committee) to explore the implementation of the WAMI Concept in Montana and to present their findings in a report due by December 28, 1972.
Late 1970	Idaho Board of Education unanimously endorsed the WAMI Concept for Idaho.
1971	
Date	**Milestone**
February 1, 1971	Presidential Odegaard announced that the Board of Regents had approved Family Medicine as a new department at UWSOM with Theodore J. Phillips as its Chair.
May 1971	UWSOM Department of Internal Medicine reorganized clinics at University Hospital, Harborview Medical Center, and U.S. Public Health Service Hospital into "Continuity Clinics for Residency Training."
July 1971	PL #92-158, "Comprehensive Health Manpower Training Act," passed by U.S. Congress. The goal to eliminate physician shortages by 1980. A $2.9 billion appropriated for three years to expand medical education.
March 17, 1971	WAMI Faculty Advisor Committee appointed by Dean Van Citters and M. Roy Schwarz, Chair.
March 22 - 26, 1971	Liaison Committee on Medical Education (LCME) accreditation review of UWSOM. WAMI Concept presented to the group. Recommendation: Five years (of possible seven years) accreditation because of recent initiation of a new curriculum, the WAMI Program, the Family Medicine Program, and the Harborview Medical Center affiliation.
March 29, 1971	Family Medicine Community Clinical Units (FMCCUs) opened in Omak and Grandview, WA.
April 2, 1971	University of Alaska (UA) subcontract completed. Provided for the teaching of the medical school curriculum using Commonwealth Foundation funds.
April 14, 1971	WAMI Program visited by staff of Bureau of Health Manpower Education (BHME).
May 1971	Richard Lyons and three faculty members spent a week in Seattle to begin planning for the entering 1971 cohort.

August 1971	WICHE Commissioners meeting at University of Alaska, Fairbanks to present WAMI Concept.
September 1971	Luncheon with Al Feiner, Director Lister Hill Center for Biomedical Communications.
September 8, 1971	Pioneer class of nine students began first quarter of Year One at the University of Alaska (UA) - included were six Alaska residents and three volunteers from Washington State. This marked the beginning of the University Phase of the WAMI Program's Experiment Phase.
November 15 - 18, 1971	Montana University Site Selection Advisory Team visited University of Montana (UM) and Montana State University (MSU). August G. Swanson, MD, Vice President for Academic Affairs of the Association of American Medical Colleges (AAMC), Chair. Recommended MSU as the site for the University Phase.
November 16 - 19, 1971	Idaho University Site Selection Advisory Team visited Idaho universities and recommended the University of Idaho (UI) as the site of the University Phase because "at this time (UI) is the only place with graduate-level faculty to teach the curriculum of the UWSOM." William O. Rieke, MD chaired the group and James R. Schofield, MD (co-secretary LCME, AAMC) was a team member.
November 17, 1971	Lister Hill Center requested WAMI to submit a proposal of experiments for the ATS-6 satellite.
December 23, 1971	The WAMI Faculty Advisory Committee at UWSOM voted to expand the Program beyond Alaska and family medicine, study the curricular implications of this decision, and apply for a Bureau of Health Manpower Education (BHME) grant to cover the costs of the expansion.
1972	
Date	**Milestone**
January 7, 1972	The UWSOM Medical School Executive Committee (MSEC) accepted and endorsed the WAMI Faculty Advisory Committee's recommendation on December 23, 1971 that the WAMI Program be expanded, that a grant be sought to cover the costs, and that the curricular implications be studied.
January 1972	Internal Medicine Residency curriculum lengthened to allow for longer periods of training in WAMI Community Clinical Units (CCUs).
February 9 - October 1972	First WAMI Faculty Retreat held in Seattle. WA, UA, WSU, UI, and MSU faculty as well as the Office of Research in Medical Education (ORME) staff, including Charles W. Dohner, PhD and Thomas J. Cullen, PhD, attended. Purpose: Orientation to WWAMI Program and define evaluation process for University Phase of WAMI Program.

February 12 - 18, 1972	Board of Education unanimously accepted Site Survey Team recommended for University of Idaho (UI) as University Phase site in Idaho.
February 24, 1972	Governor's Advisory Council on Comprehensive Health Planning strongly endorsed the WAMI Program for Idaho.
March 2 - 3, 1972	Board of Regents of University of Idaho (UI) adopted the Site Survey Team's recommendation, choosing UI as the Idaho site for the University Phase of the WAMI Program. Members of the Board of Regents also served as members of the State Board of Education.
March 3, 1972	The first Bureau of Health Manpower Education (BHME) contract proposal submitted for period of April 1, 1972 through June 30, 1973. Request for $1,544,434.00. Awarded: $1,519,315.00 ($25,119.00 less than requested.
March 20, 1972	M. Roy Schwarz, MD and Roger L. Bennett met with Montana Medical Education Planning Committee. Committee voted to join WAMI Program with Montana State University (MSU) as the University Phase site.
March 24, 1972	Letter from Cecil D. Andrew, Governor of Idaho, enthusiastically endorsing WAMI Program of Idaho received by M. Roy Schwartz, MD.
April 11, 1972	In-person report President Quigg Newton and Vice President Robert J. Glazer, MD of the progress on their Commonwealth Foundation Grant. WAMI film presented for the first time along with a written report. UWSOM participants include: Robert L. Van Citters, MD, M. Roy Schwarz, MD, August G. Swanson, MD, and Roger L. Bennett.
April 1972	Liaison Committee on Graduate Medical Education (LCGME) established. (In 1981, the LCGME became the Accrediting Council for Graduate Medical Education, ACGME.)
May 5, 1972	UWSOM and Washington State University (WSU) finalized teaching program at WSU. Ronald J. Adkins, PhD appointed WAMI Coordinator.
May 5, 1972	First discussion of joint WSU-UI program.
June 1972	Alaskan Native leader, Walther Soboloff, endorsed the WAMI Program.
May 24, 1972	BHME initial contract for $1,519,315.00 approved for June 1972 through August 1976 to expand the WAMI Program to UI and WSU and beyond Omak and Grandview, WA's Family Medicine CCUs in Washington State. Titled: "Conduct an Experiment of a Four State Network of Medical Education." UWSOM signed the contract on May 26, 1972.
June 1, 1972	Family Medicine CCUs at Whidbey Island and Anacortes, WA opened.

June 2, 1972	First report on possible communications satellite experiments provided to the Medical School Executive Committee, MSEC.
June 7, 1972	UI signed WAMI subcontract to teach Year One medical students. Guy T. Anderson, PhD appointed Coordinator.
June 1972	Idaho Board of Education approved Boise CCU in obstetrics and gynecology. David M. Borton, MD appointed as coordinator.
July 3, 1972	Planning with National Institutes of Health (NIH) for ATS-F/6 satellite experiments completed.
July 11, 1972	Following the recommendation of the Montana University Site Selection Advisory Team, the Montana Medical Education Planning Committee recommended MSU as the University Site in Montana. Regents of the Montana University System accepted this for the Experimental Phase of the WAMI Program.
July 1972	WICHE Commissioners meeting at Lake Tahoe, CA. Purpose: A discussion of medical education. Panel composed of: William R. Wood, PhD (UA), Ernest Hartung (UI), John Cooper, PhD (University of Wyoming, UWY), Senator Gordon Sandison (Chair of the Higher Education Committee, Washington State), and Ed Nelson (Executive Secretary, University of Montana System Board of Trustees).
July 30 - August 2, 1972	Second WAMI Faculty Retreat held at Rosario Estates, Orcas Island, WA. UA, UI, WSU, and UWSOM faculty defined common course content and items to evaluate student performance.
August 1972	Kenneth Endicott, Director of BHME, and Dr. Martin Cummings, Director of the National Library of Medicine (NLM), visited WAMI states.
August 30, 1972	WSU-UI first class began the first quarter of Year One. Ten students at WSU, nine students at UI, and eleven students at UA making a total of thirty students in the WAMI Program.
August 31, 1972	MSEC Report on satellite experiments.
September 1, 1972	Obstetrics/gynecology (OB/GYN) CCU opened in Boise, ID.
September 1, 1972	Robert C. Davidson, MD appointed Associate Director of WAMI for Continuing Medical Education, CME.
September 11, 1972	Update on ATS-6/F program given to MSEC.
October 1, 1972	Marion Johnson appointed Communications Director of WAMI Program.
December 1, 1972	John L. Boor joined WAMI Program Satellite Project Office as Chief of Operations of Satellite Communications, and on July 1, 1973 became Project Manager of Satellite Communications.
December 29, 1972	Report endorsing "cooperative frameworks," such as the WAMI Program, send from Montana Medical Education Planning Committee to Governor Forest Anderson.

1973	
Date	**Milestone**
January 1973	UWSOM Independent Study Program initiated.
January 5, 1973	The Department of Health, Education and Welfare, the Corporation for Public Broadcasting, and NASA formally announced the "Northwest Health Education and Health Care Experiment," and that UWSOM was coordinating and serving as the experimenting agency.
February 9 - 10, 1973	Third Faculty Retreat ("Seattle II") in Seattle, WA. Fifty attendees from the University Phase only were present. No Montana State University (MSU) faculty attended.
March 2, 1973	Idaho Board of Education authorized "Alternatives in Health Education in Idaho," recommended by Idaho Advisory Board for Health Education. John M. Ayers, MD served as Chair. Report submitted in September 1973.
March 26, 1973	Kodiak, Alaska Family Medicine CCU opened.
April 1973	Washington State Senate Resolution #1973-130 passed calling for UWSOM to explore ways to increase class size, and report findings in September 1973.
May 18, 1973	Boise Cascade luncheon for Idaho business leaders led by John Fery, Vice President of the Boise Cascade. Raised $120,000 dollars to initiate Community Clinical Unit (CCU) in Idaho.
July 1, 1973	M. Roy Schwarz, MD appointed Associate Dean for Academic Affairs at UWSOM, as well as the Director of the WAMI Program, and the satellite education project.
July 1, 1973	Pediatric CCUs opened in Great Falls, MT and Pocatello, ID.
July 31 - August 2, 1973	Fourth WAMI faculty retreat on Orcas Island (Rosario II). One hundred and five (105) attendees including MSU faculty and administrators.
September 1, 1973	UWSOM submitted description of ATS-6 experiments to NASA resulting in time allotted for 75 broadcasts to Fairbanks, AK and Omak, AK from UWSOM in Seattle, WA.
September 4, 1973	First class of ten students begin first quarter of Year One at Montana State University, MSU.
September 1973	First quarter of Year One curriculum presented for the first time in all four WAMI states.
September 1973	WSU WAMI students' field trip to Omak, WA Family Medicine CCU. WAMI students at UI visited Family Medicine CCU in Grandview, WA.
September 1973	WAMI Speakers Bureau established.

September 13, 1973	Advisory Board for Health Education unanimously recommended Idaho participation in WAMI Program because "WAMI is the only feasible alternative for Idaho medical education."
September 24, 1973	Breakfast meeting of WAMI states' governors at Western Governors' Conference at Salishan Lodge, OR hosted by Governor Daniel J. Evans (WA) for William A. Egan (AK), Thomas L. Judge (MT), and Cecil D. Andrews (ID).
September 28, 1973	Dean Robert L. Van Citters, UWSOM, received letter from John B. Welsh, General Counsel for Washington House of Representatives concerning a study of medical manpower and needs in Washington State. Draft of staff report for Representative A. A. Adams, the Chair of the Committee on Social and Health Services, titled: "Suggested Legislative Proposals for Providing Health Care in Washington - Part I: Meeting the Health Manpower Needs."
September - October 1973	First issue of WAMI News published.
October 1973	Bureau of Health Manpower Education changed to Bureau of Health Resource Development of Human Resource Administration.
October 5, 1973	Report on the future of Continuing Medical Education (CME) as a regional effort at UWSOM approved by the Medical School Executive Committee, MSEC.
November 2, 1973	UWSOM Dean Van Citters testified at Washington State Legislative Hearing on medical school class size and distribution of physicians in the state.
December 1973	One hundred and twenty-nine students took clerkships in family medicine, pediatrics, and obstetrics/gynecology (OB/GYN) at regional CCUs.
December 6, 1973	ATS-6/F satellite broadcast schedule of 1974-75 set with one hundred broadcasts.
1974	
Date	**Milestone**
January 1, 1974	Psychiatry CCU opened in Anchorage, AK.
January 1, 1974	Ronald J. Lemire, MD appointed Associate Director of WAMI Program for Community Phase.
1974	WSU's College of Veterinary Medicine embarked upon a similar WAMI style regional program, led by Dean Leo Bustad.
March 26, 1974	Richard Marsten, Deputy Director of NASA, visited UWSOM to review plans for satellite broadcasts in the WAMI program.
April 1, 1974	Letter of Intent to experiment using the CTS satellite sent to NASA by Wasyl M. Lew.
April 1, 1974	Internal Medicine CCU opened in Wenatchee, WA; Missoula and Billings, MT.

April - June, 1974	WAMI model incorporated in Health Manpower Bill sponsored by Congressman Paul Rogers of Florida.
May 10, 1974	Permanent WAMI Administration Reorganization Plan endorsed.
May 30, 1974	ATS-6/F satellite launched from Cape Kennedy, FL.
May 31, 1974	M. Roy Schwarz and Robert L. Van Citters testified before Congressman Paul Rogers' Subcommittee on Health and Environment.
May 1974	King County (Washington) Medical Society Library Collection (30,000 volumes) gifted to Montana State University, MSU.
June 16 - 19, 1974	Fifth faculty retreat held on Orcas Island (Rosario III).
June 26, 1974	M. Roy Schwarz and John N. Lein testified before Senator Ted Kennedy's Subcommittee on Health of the Commerce, Labor, and Public Welfare Senate Committee on the WAMI Program.
July 1974	Idaho Medical Association voted unanimously to continue the WAMI Program.
July 1, 1974	Pediatrics CCU opened in Spokane, WA.
August 27, 1974	Satellite planning meeting held in Seattle, WA.
September 1974	Frank Newman, PhD replaced John Jutila as the MSU WAMI Coordinator. Jutila became Vice President for Research at MSU.
September 1974	UWSOM Academic Affairs reorganized by integrating the WAMI Program into the structure at the School.
September 1974	Additional research data available showed equivalency of learning between all University Phase WAMI students and "Home Base" students.
September 8, 1974	Twelve students began entire Year One curriculum at the University of Alaska. WSU, UI, and MSU continued presenting only the first quarter curriculum,
September 19, 1974	First of forty-five satellite broadcasts conducted from Seattle, WA to Fairbanks, AK.
September 24, 1974	National Press Conference was held on WAMI Program featuring Senators Warren G. Magnuson (WA), Theodore (Ted) Stevens (AK), and Secretary Casper Weinberger (HEW).
October 8, 1974	Judge George Revelle (King County Superior Court) ruled in favor of UW in *Rice v. Hogness* admission discrimination suit based on State Residency.
October 8 - 9, 1974	Pre-accreditation site visit to the University of Alaska (UA) by a team composed of Harold J. Simon, MD, PhD, Ronald L. St. Pierre, PhD, and Malcom S. M. Watts, MD.
November 13, 1974	Governor Daniel J. Evans (WA) addressed Association of American Medical Schools' annual meeting - called WAMI a "Model for Interstate Cooperation."

November 17 - 18, 1974	State Senator Gordon Sandison sponsored four-state Legislative Conference in Spokane, WA. Attending were four Governors, legislators, Boards of Higher Education, presidents of five universities, Department of Health, Education and Welfare representatives, and State Appropriation Committees' members.
December 1974	Kasonic, Chapelle, and Associates' Report, "Analysis of Medical Education Costs in the WAMI Program," completed. Report used as basis for AMI states' appropriations for WAMI.
December 5, 1974	Gross anatomy examination given to Year One students at UA with exam specimens in Seattle, WA.
December 7, 1974	First satellite signals sent from Seattle to Omak, WA to test technology.
December 10, 1974	First satellite broadcast from Seattle to/from Omak, WA.
1975	
Date	**Milestone**
1975	Liaison Committee on Graduate Medical Education (LCGME) began to formally accredit residency training programs.
January 1, 1975	Family Medicine CCU opened in Whitefish-Kalispell, MT (14th CCU; 6th Family Medicine CCU)
February 7, 1975	UWSOM Medical School Executive Committee voted, in the Executive Session, 25:1 to continue the WAMI Program with emphasis on needs of departments for financial support, space, and faculty, provided a UWSOM faculty vote occurred with this decision.
February 17, 1975	Washington State Legislature passed the "Family Practice Education Act" establishing and funding a statewide residency program.
March 6, 1975	UWSOM faculty voted 227:26 to make the WAMI Experiment a permanent part of the School. Motion made by John Sherris, MD, ad hoc WAMI Committee Chair.
March 9, 1975	Construction of the Trans Alaskan Pipeline began. Largest private construction project in history.
March 16 - 18, 1975	Pre-accreditation site visit to the University of Idaho by a team composed of Harold J. Simon, MD, PhD, Stanley Olsen, MD, and William Cooper, PhD.
March 18 - 19, 1975	Pre-accreditation site visit to the Washington State University by a team composed of the same people who visited the University of Idaho on March 16-18, 1975 and Montana State University from March 19-21, 1975.
March 19 - 21, 1975	Pre-accreditation site visit to Montana State University by a team composed of the same people who visited the University of Idaho on March 16-18, 1975 and Washington State University on March 18-19, 1975.

March 19, 1975	Governor Cecil D. Andrus (ID) signed a bill authorizing $256,000 for WAMI Program for the 1975-76 academic year. First state to make WAMI Program permanent.
April 22, 1975	Senate Bill #2517, "University of Washington Regionalized Medical Education Tuition and Fees," passed the Senate of the State of Washington.
May 1, 1975	Governor Thomas L. Judge (MT) signed WAMI Appropriation Bill containing $786,000 for 1975-77 biennial WAMI Program, including $300,393 for the 1975-76 academic year.
May 7 - 8, 1975	Victor Zafra, the Chief Health-Medical Programs for the Office of Management and Budget made second visit to learn about progress of WAMI Program and to see an ATS-6 satellite broadcast.
May 19, 1975	Senate Bill #2517 passed Washington State House of Representatives.
May 28, 1975	Governor Daniel J. Evans (WA) signed into law Senate Bill #2517 permitting UW to charge medical students from Alaska, Montana, and Idaho in-state tuition. Senator Gordon Sandison, Chair of the Senate on Health Education Committee, was the Chief Sponsor of the Bill.
May 29, 1975	Final ATS-6 satellite broadcast conducted.
June 7, 1975	Seven of the original nine WAMI Pioneer Students (1971) at the University of Alaska graduated from UWSOM. One other student graduated in 1974, and another in 1976.
June 11 - 13, 1975	WAMI Faculty Retreat held in Seattle, WA (Retreat #6 and #3 in Seattle). Steve Biering, Dean of the Indiana School of Medicine, was the featured speaker.
July 1, 1975	Family Medicine CCUs opened in Spokane, WA and Pocatello, ID (15th & 16th CCU and 7th & 8th Family Medicine CCU).
July 1, 1975	Key staff personnel changes: Zenaido Comacho, PhD appointed the Assistant Dean of Student Affairs at UWSOM; Wayne Myers, MD appointed WAMI Coordinator for the University of Alaska replacing Richard Lyons, MD; Mabel May, PhD appointed Head Evaluator of the Clinical Phase of the WAMI replacing Elisabeth Zinser, PhD; and, Joseph B. Deisher, MD appointed Family Medicine WAMI Coordinator replacing H. Thomas Weigert, MD.
July 1, 1975	MEDCON regionalized medical consultative service initiated.
July 1, 1975	State funding of WAMI began with corresponding decrease in federal funding. State appropriations totaled $1,115,093 dollars, as follows: WA - $250,000; AK - $308,000; MT - $300,383 / $786,000 for two academic years; and, ID - $256,700.
July 8, 1975	Medical School Executive Committee review of UWSOM's funding determines is was significantly under-budgeted.

July 21 - 23, 1975	Conference in Denver, CO: "Communication Satellites for Health," presented WAMI in three papers that offer an overview of the project, describe its application to healthcare delivery, and evaluation of the project to-date.
August 6, 1975	Memorandum of Understanding between the University of Washington and State of Montana signed by Lawrence K. Pettit, PhD, Commissioner of Higher Education in Montana.
August 22, 1975	UW Board of Regents approved agreements with Alaska, Montana, and Idaho (AMI). Tuition for AMI students is $50 dollars per quarter.
September 1975	A full year of instruction in the University Phase was implemented at all four cooperating WAMI universities (implemented at the University of Alaska for the second academic year).
September 8, 1975	Macy Foundation Invitational Conference held at the Given Institute in Aspen, CO. M. Roy Schwarz, MD gave paper on "Regionalized Medical Education: The WAMI Program."
September 10, 1975	Twelve entering 1975 students from the University of Alaska out-performed UWSOM students on Mini National Board of Medical Examiners test given at the very end of Year One.
September 26, 1975	Internal Medicine Review course featuring nine professors from UWSOM began in Billings and Missoula, MT.
September 29, 1975	Pediatrics Review course began and presented in Boise, Great Falls, Pocatello, (ID), and Spokane, WA.
October 1975	Thirty-nine proposed CTS experiments at seven sites reduced to five at three sites by LHC and NASA.
October 16 - 24, 1975	LCME accreditation site visits conducted involving nine people for eight days (longest in U.S. history of U.S. medical education), and covering most of the WAMI sites. (By July 22, 1976, the LCME formally approved the recommendation of this Site Survey Team.)
October 22, 1975	Robert L. Urata, WAMI Alaska student (entered in 1973) appointed as one of two student members of the DHEW Department's National Advisory Council on Health Profession Education.
October 24, 1975	Verbal Exit Meeting of the October Site Survey Team recommended a full seven-year accreditation to the LCME.
November 1975	A national report of the Coordinating Council on Medical Education entitled, "Physician Manpower and Distribution: The Primary Care Physician" was published.
1976	
Date	**Milestone**

1976	Werner Samson, MD, a practicing cardiologist, appointed the Assistant Dean for Admissions replacing Benjamin Belknap, MD at UWSOM.
January 1, 1976	Canadian Technology Satellite (CTS) launched from Cape Kennedy, Florida at 6:27:54 a.m.
March 14 - 20, 1976	First Polish-American Medical Week in Warsaw & Krakow, Poland. WAMI featured in speech by M. Roy Schwarz, MD.
June 16 - 18, 1976	Faculty Retreat in Seattle, WA (Retreat #7 and #4 in Seattle).
June 30, 1976	BHME/HRA Contract (#2 of 3) totaling $980,480 dollars required matching funds from WAMI states (50:50).
July 1, 1976	Family Medicine CCU opened in Spokane, WA with Michael Metcalkf as the Coordinator.
July 1, 1976	Family Medicine CCU opened in Pocatello, ID with Samuel Romero as the Coordinator.
July 1976	CTS Program from the HRA for $362,840 dollars began to conduct experiments in regional faculty sharing, clinical consultation, independent learning, admissions' minority recruitment, and the legislative process. (This ended in December of 1978.)
July 22, 1976	LCME officially approved seven years of accreditation for the UWSOM, including WAMI as recommended by the October 1975 LCME Site Survey Team.
July 30, 1976	A seedling from the tree in Greece under which the icon on medicine, Hippocrates, taught was planted on the UWSOM Health Science Center (HSC) grounds. A second seedling was transplanted on the University of British Columbia. (These were among the first seedlings successfully transplanted from the ancient tree.)
September 11, 1976	Mark E. Burns and Jane Burkheimer married (both entering 1974 WSU WAMI students). First marriage in the WAMI program!
September 30, 1976	*Claudia Wells v. Hogness* suit alleging discrimination based on sex, minorities, and AMI students decided by Judge Charles Denny in favor of UWSOM. This is the second suit involving the WAMI Program.
October 1, 1976	Nicanor Manangan dismissed from the UWSOM after five years of unsuccessful study at UWSOM. Final appeal to Academic Affairs Committee denied. This led to a law suit against UWSOM in 1977.
1977	
Date	**Milestone**
1977	Liaison Committee on Continuing Medical Education (LCCME) established. In 1981, this became the Accreditation Council for Continuing Medical Education *ACGME).

January 18 - 30, 1977	"Medical Education Week" trip to Cairo and Alexandria, Egypt. WAMI featured in speeches by M. Roy Schwarz, MD. The U.S. delegation included: William G. Anlyan, MD, the Vice President of Health Affairs at Duke University; Kenneth Crispell, MD, the Vice President of Health at the University of Virginia; and, Daniel O. Tosteson, MD, the Dean of Harvard Medical School.
March 30 - April 1, 1977	National "Rural Health Conference" sponsored by the WAMI Program and the American Medical Association (AMA) in Seattle, WA. At this conference, the CTS Portable Earth Terminal (PET) broadcast featured AMA President Robert B. Hunter, MD interacting from Seattle, WA with Kenneth Endicott, MD in Bethesda, Maryland. (Governor Dixie Lee Ray of WA State toured and observed the PET broadcasts.)
June 13 - 16, 1977	Eighth Faculty Retreat held at Orcas Island (Rosario IV).
June 21, 1977	Superior Court Judge James J. Dore, Jr. ruled against Frederick McDonald in his admissions discrimination lawsuit, *McDonald v. Hogness*. (Third admission lawsuit the WAMI Program.)
June 25, 1977	Primary Care Tracks for residents in Internal Medicine began in Seattle, WA and in Boise, ID at the Veterans' Administration Hospital.
July 1, 1977	Obstetrics/gynecology (OB/GYN) CCU opened in Spokane, WA with Harvey Frazier, MD as the coordinator.
July 28, 1977	CTS broadcasts began between UWSOM & UA and UWSOM & MSU. Portable Earth Terminal (PET) broadcasts demonstrated from August to September 1977.
September 21 - 22, 1977	Minister of Health of Poland, Marion Sliwinski, MD visited UWSOM to focus on the WAMI Program and CTS broadcasts.
October 31, 1977	Nicanor Manangan's lawsuit against UWSOM challenging his dismissal from UWSOM, filed on September 9, 1977, heard by Judge George Revell who ruled in favor of UWSOM.
1978	
Date	**Milestone**
1978	UW University Hospital established an in-patient service for family medicine.
April 20 - 21, 1978	AAMC's Western Group on Medical Education meeting at the University of Hawaii, Honolulu, HI, chaired by Harold J. Simon, MD, PhD. The meeting's theme was: "WAMI: A Model for University - Legislative Interactions."
May 12, 1978	"Introduction to King Tut" lecture given by M. Roy Schwarz, MD to seven hundred people from across the WAMI states. Speech based upon 1977 trip to Egypt to discuss WAMI Program. King Tut Exhibit opened in Seattle shortly thereafter.
June 25 - 26, 1978	Ninth Faculty Retreat held at Orcas Island (Rosario V).

July 1, 1978	Family Medicine CCUs opened in Ketchikan, AK with William Hendrickson, MD as the coordinator, and in Anchorage, AK with Thomas Nyswander, MD as the coordinator.
July 1, 1978	On July 1, 1978 (the beginning of WAMI's 1979 fiscal year) the WAMI Program was funded solely from the WAMI state sources (federal aid ended).
September 1978	UWSOM class size increased from 175 students, which included twenty-five positions for Washington State residents.
October 1, 1978	Obstetrics/gynecology (OB/GYN) CCU opened in Anchorage, AK with Hedrick Hansen, MD as the coordinator. This was the twentieth CCU in the WAMI Program.
October 27, 1978	CTS-mediated broadcast for the Health Planners Conference in Seattle, WA to Bethesda, MD. The program title was "National Guidelines for Health Planning," featured Dr. Henry A. Foley, administrator, HRA and Mr. Colin Rorrie as the Acting Director of Health Planning for the HRA.
November 3, 1978	UW Health Science Center named after Senator Warren G. Magnuson and dedicated to honor him for his many contributions to UWSOM.
1979	
Date	**Milestone**
January 1979	McDonald's admissions lawsuit appealed the Pro-UWSOM decision of the lower court to the WA State Supreme Court.
January 18, 1979	CTS Portable Earth Terminal (PET) broadcast between Boise, ID and Seattle, WA featured members of the Education and Health and Welfare Committees of the Idaho House of Representatives in Boise and M. Roy Schwarz, MD with four Idaho students in Seattle, WA. The Committees reviewed the Fiscal Year 1980 (FY'80) WAMI budget request and students' perceptions of the WAMI Program.
January 25, 1979	In blizzard conditions, a consultation broadcast was made using the PET terminal between Seattle, WA and American Falls, ID, a town with a population of one thousand.
February 1, 1979	CTS PET broadcast between Helena, MT (the state capitol) and Seattle, WA featured Lt. Governor Theodore Swinden and members of the Montana Legislature (in Helena, MT) and M. Roy Schwarz, MD with two Montana students in Seattle, WA. FY'80 WAMI budget request reviewed, and students discussed WAMI Program perceptions.
February 2, 1979	National Fund for Medical Education grant awarded to UWSOM for computer-assisted test construction at WAMI regional sites.

February 15, 1979	CTS satellite mediated visit of the LCME members to the WAMI Program. The LCME representatives were located in the Lister Hill Center for Biomedical Communication of the National Library of Medicine (Bethesda, Maryland) and, in turn, visited MSU in Bozeman, MT, the University of Alaska (Fairbanks, AK), and UW (Seattle, WA). This was the first type of accreditation visit ever conducted by satellite in the history of medical education in the world.
June 13, 1979	PET-mediated broadcast from Browning, MT to Seattle, WA featured students, teachers, counselors, and parents of American Indian (Blackfeet) descent.
June 27, 1979	Final CTS broadcast via PET from Rosario Estates, East Sound, WA to Bethesda, MD. Project directors of the five WAMI experiments and the Director of the Satellite Program at UWSOM reported the results of the effort to representatives of the funding agencies of the U.S. government.
June 30, 1979	M. Roy Schwarz, MD resigned as UWSOM's Associate Dean for Academic Affairs and Director of the WAMI Program to become Dean of the University of Colorado School of Medicine.
August 2, 1979	Washington State Supreme Court affirmed Judge James J. Dore, Jr.'s decision against Frederick McDonald's (*McDonald v. Hogness*) allegation of discrimination in UWSOM's admissions processes.
1980	
Date	**Milestone**
1980	University of Wyoming Family Medicine Residency Program established in Cheyenne, WY.
1985	
Date	**Milestone**
1985	WAMI Area Health Education Centers (AHECs) funded to train, recruit and retain health personnel for medically underserved areas. WAMI Center for Health Workforce Studies funded by the Bureau of Health Professionals to conduct policy-relevant health research and provide guidance to policymakers on health workforce issues.
1986	
Date	**Milestone**
1986	Graduate Medical Education (GME) training grows in WAMI region to include nine combined student-residency family medicine teaching units supporting the training of 149 residents. Internal Medicine offers a primary care track in Boise, ID and rotations in Montana and Washington. Pediatrics, obstetrics & gynecology, and psychiatry add community-based residency programs.

1989	
Date	**Milestone**
1989	Minority Medical Education Program starts guidance for under-represented minority college students interested in careers in medicine. Rural/Underserved Opportunities Program (R/UOP) launched.
1991	
Date	**Milestone**
1991	Spokane Advanced Clinician Track of the UW Psychiatry Residency Program is established.
1993	
Date	**Milestone**
1993	UWSOM graduates matching into primary care residencies exceed 50%.
1994	
Date	**Milestone**
1994	New program "Students Providers Aspiring to Rural and Underserved Experiences" (SPARX) initiated and provides interdisciplinary experiences to encourage practice in rural or urban underserved communities.
1996	
Date	**Milestone**
1996	Montana Family Practice Residency established in Billings, MT. Wyoming becomes fifth state to join the **WWAMI** Program.
1997	
Date	**Milestone**
1997	WWAMI Rural Telemedicine Network is funded by the federal Office of Rural Health Policy to explore the use of telemedicine consultations for rural communities.
1998	
Date	**Milestone**
1998	First class participates in WWAMI Rural Integrated Training Experience (WRITE) Program. Alaska Family Practice Residency established in Anchorage, AK.
2000	
Date	**Milestone**
2000	UW residents have completed 2,766 clinical rotations at WWAMI sites since 1970.
2002	
Date	**Milestone**

2002	WWAMI Program received Outstanding Community Service Award from AAMC.
2005	
Date	**Milestone**
2005	Institute for Simulation and Interprofessional Studies (ISIS) is initiated to enhance procedural skills training, medical teamwork, and patient safety.
2006	
Date	**Milestone**
2006	Idaho Track of the UW Psychiatry Residency Program is established in Boise, ID and Pocatello, ID.
2008	
Date	**Milestone**
2008	Washington State University-Spokane joins **WWAMI**. Targeted Rural Underserved Track (TRUST) starts in Montana. The program expands to eastern Washington in 2009 and into western Washington in 2010.
2010	
Date	**Milestone**
2010	First WWAMI Graduate Medical Education Summit held in Spokane, WA. UWSOM clerkship sites grow to a total of 165.
2011	
Date	**Milestone**
2011	Boise Internal Medicine Residency established. The three-year training program is sponsored by the Department of Medicine. Wyoming adds four medical school seats to bring the total class size to twenty, and total UWSOM students to 225.
2012	
Date	**Milestone**
2012	Official statement released pertaining to WWAMI Program's curriculum renewal plans.
2014	
Date	**Milestone**
September 2, 2014	WWAMI's renewed curriculum is implemented.

APPENDIX F

Data Analyzed per Category and by Purpose

Data Reviewed	Purpose	Outcome
Review of literature that guided the study.	Commencement of the analytic process within a set of broad themes.	Afforded the identification of broad themes.
Read & reviewed archival documents and other transcripts to gather data and develop an initial coding list.	Becoming familiar with the data, knowing it thoroughly, and create an initial coding list.	Allowed for the creation of an initial set of five codes.
Initial coding (identifying major theme buckets) and revision of initial "emergent" themes list.	Measure the number of instances a code was noted/utilized, and determining which codes could be merged, collapsed, or eliminated.	Process permits the identification of redundant codes, codes that could be merged or eliminated.
Applying coding of major emergent themes to archival documents, transcripts, and public/published records and informal accounts.	Code data to identify major themes (from many stakeholders' perspectives).	Identification of emergent themes from the data collected and reviewed.
Systematic sorting of codes into major categories.	Linking codes with major themes using direct quotes and other evidence against theoretical concepts.	Substantiate emergent themes per the data collected and analyzed.

Adapted from K. T. De Pedro, M. C. Esqueda, J. A. Cedarbaum, & R. A. Astor (2014). District, school, and community stakeholder perspectives. *Teachers College Record, 116*(5), p. 11.

APPENDIX G

Types of Curricular Approaches in Medical Education

Parameter	Discipline	Organ System	Compliant
Management	Department w/ variable central oversight.	Some central management required.	Significant central management essential.
Administrative Effort	Efficient, broad faculty engagement not required.	Efficient, but some degree of broader faculty engagement is necessary.	Broad faculty engagement required. Designated teaching faculty track is common.
Contextual Presentation of Material	Information typically not presented in format accessed.	Information is presented in a more contextual form.	Information presented contextually.
Reinforcement of Presented Material	Typically, does not reinforce or update students' knowledge base in a deliberate or consistent manner.	Typically, does not reinforce or update students' knowledge base in a deliberate or consistent manner.	May or may not deliberately reinforce integration of basic and clinical material.

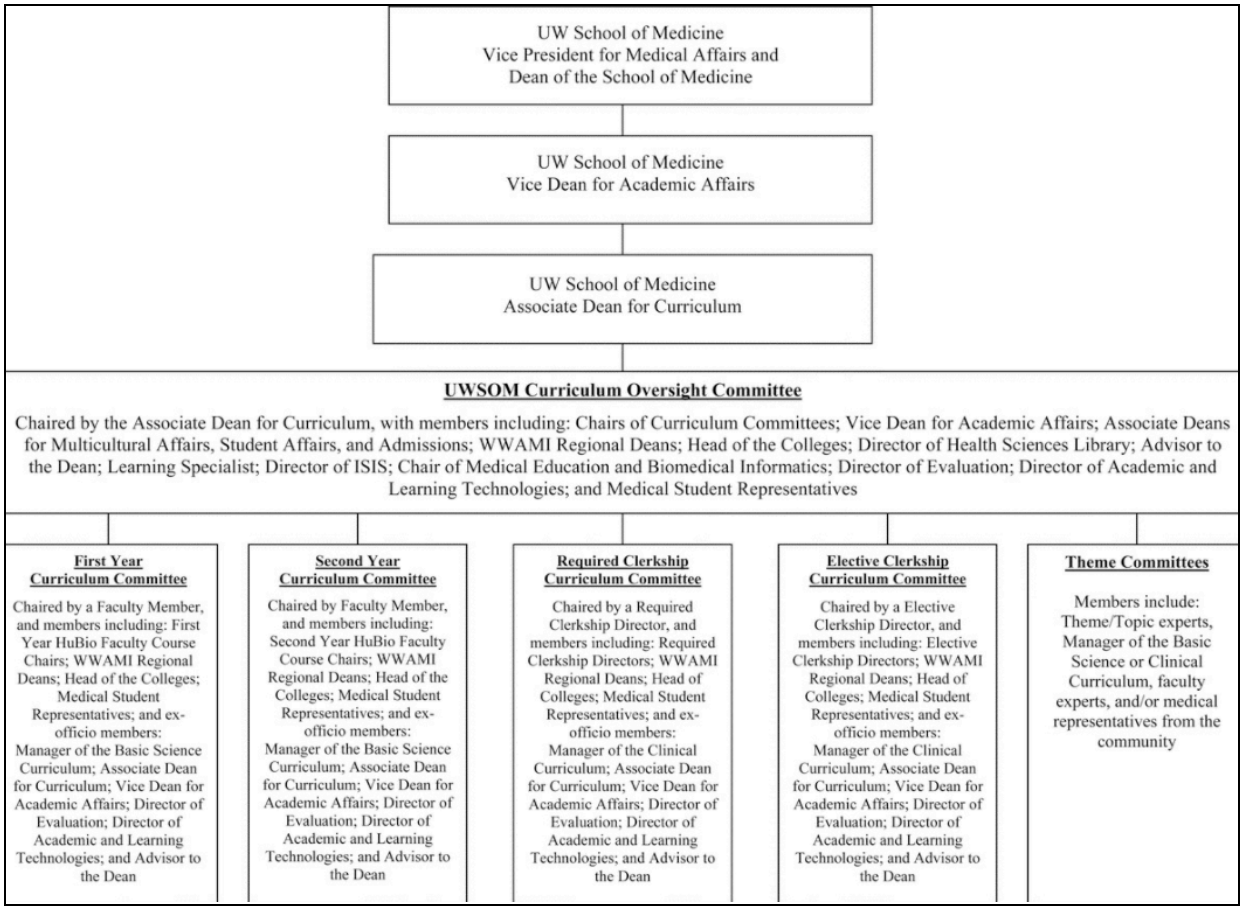
APPENDIX H

External Challenges Facing Medical Education

Growth of Knowledge	Exponential increases/advances Need to define core concepts
Societal Issues	Health disparities Disease prevention Aging Population Expectations of other health-care stakeholders
Individual Issues	Continued specialization within medicine Increased importance of lifestyle issues Implications for practice preferences and work force
Technology	Human genome and personalized medicine High-resolution functional imaging Implication for physical diagnosis Simulation science and quality improvement Information science Just-in-time learning Availability to patients, faculty, and students Leveling of the playing field of knowledge Greater adeptness of students/patients than faculty Need faculty development
Healthcare Reform	Impact yet to be fully defined Interprofessional education

APPENDIX I

University of Washington School of Medicine's (UWSOM) Governance Structure



Source: UW School of Medicine governance. Reprinted from School of Medicine Governance Committees, In *School of Medicine Governing Committees*, 2016, Retrieved July 15, 2017, from http://blogs.uw.edu/somcurr4/committees/.

APPENDIX J

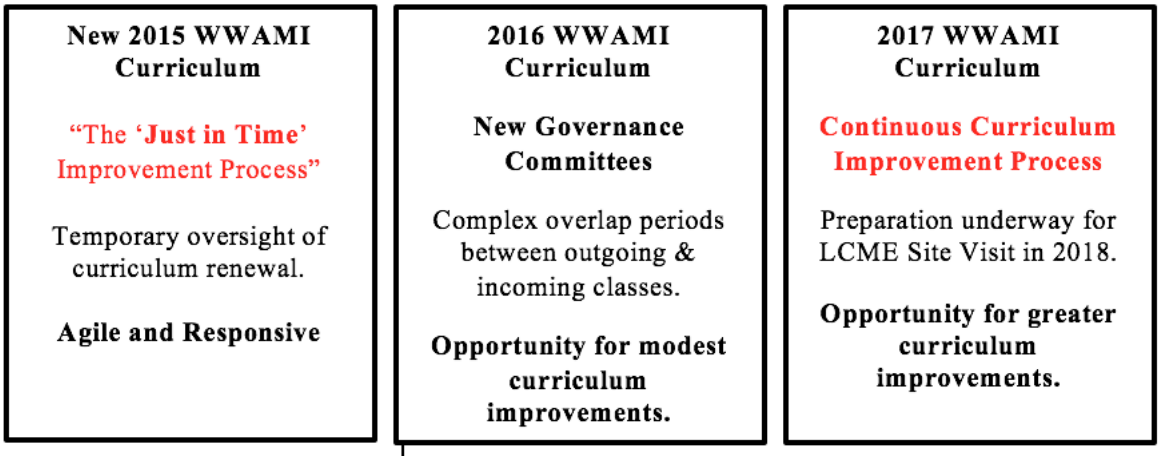
Mapping of UWSOM's Educational Program Objectives (EPOs) and 2009-2010 LCME Accreditation Standards and Elements for Coding Purposes of this Research

Element #	2010-2015 LCME Standards
1.1	IS-1
1.2	IS-5 and FA-8
1.3	FA-13 and FA-14
1.4	ER-9 and ER-10
1.5	IS-4
1.6	IS-3
2.1	IS-7
2.2	IS-10
2.3	IS-8 and IS-9
2.4	IS-11
2.5	ED-39 and ED-40
2.6	ED-41
3.1	ER-8
3.2	IS-13 and IS-14
3.3	IS-16 and MS-8
3.4	MS-31
3.5	MS-31-A
3.6	MS-32
4.1	FA-2
4.2	FA-5
4.3	FA-7 and FA-9
4.4	FA-10
4.5	ED-30, FA-4, FA-11
4.6	FA-12
5.1	ER-2
5.2	ED-36
5.3	ER-3
5.4	ER-4
5.5	ER-6
5.6	ER-7
5.7	ER-5
5.8	ER-11 and ER-12
5.9	ER-13 and ER-14
5.10	MS-12
5.11	MS-37 and ER-7
5.12	ED-9, ER-1, ER-9
6.1	ED-1-A and ED-3
6.2	ED-2
6.3	ED-5-A

6.4	ED-16
6.5	ED-18
6.6	IS-14-A
6.7	IS-12
6.8	ED-4
7.1	ED-10 and ED-11
7.2	ED-10, ED-13, ED-14, ED-15
7.3	ED-12 and ED-17-A
7.4	ED-6
7.5	ED-20
7.6	IS-16, ED-21, ED-22
7.7	ED-23
7.8	ED-19
7.9	ED-19-A
8.1	ED-33
8.2	ED-1
8.3	ED-34, ED-35, ED-37
8.4	ED-46
8.5	ED-47
8.6	ED-2
8.7	ED-8
8.8	ED-38
9.1	ED-24
9.2	ED-25
9.3	ED-25-A
9.4	ED-26, ED-27, ED-28
9.5	ED-32
9.6	ED-29
9.7	ED-31
9.8	ED-30
9.9	ED-42 and MS-34
10.1	MS-1 and MS-2
10.2	MS-4 and MS-7
10.3	MS-3, MS-11, MS-33
10.4	MS-5, MS-6
10.5	MS-9
10.6	MS-10
10.7	MS-13, MS-14, MS-15
10.8	MS-16, MS-17
10.9	ED-43
11.1	MS-18
11.2	MS-19 and FA-6
11.3	MS-20
11.4	MS-22
11.5	MS-35

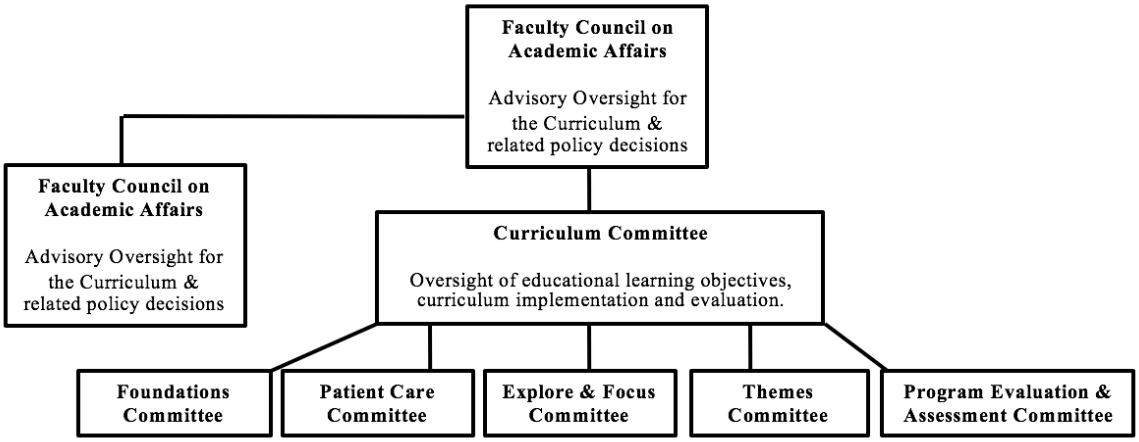
APPENDIX K

UWSOM's Transition from Outgoing to New Governance



APPENDIX L

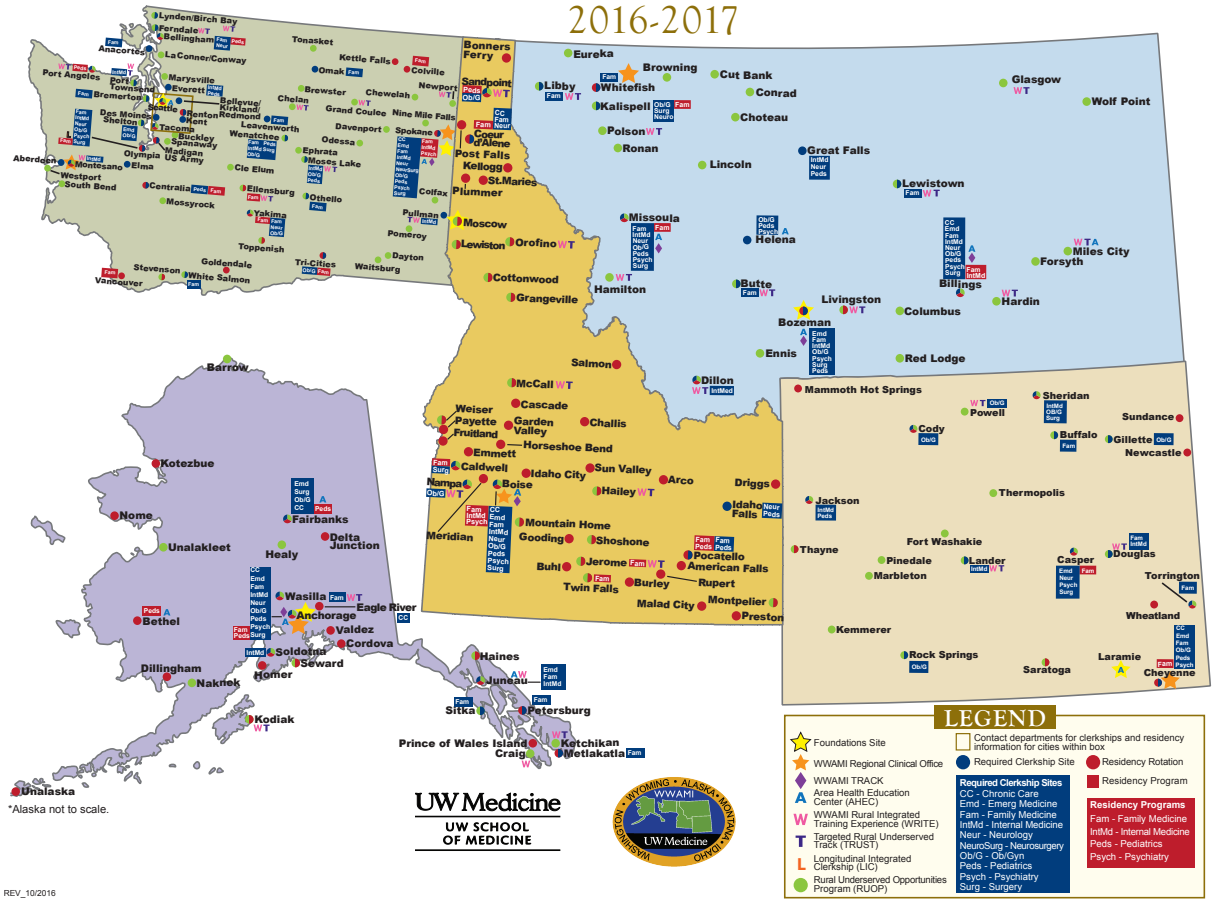
University of Washington School of Medicine's (UWSOM) Curriculum Governance



Source: REPORT SOM curriculum governance committee. Reprinted from Curriculum Governance, In *School of Medicine Governing Committees*, 2016, Retrieved October 28, 2017, from http://blogs.uw.edu/somcurr4/committees/.

APPENDIX M

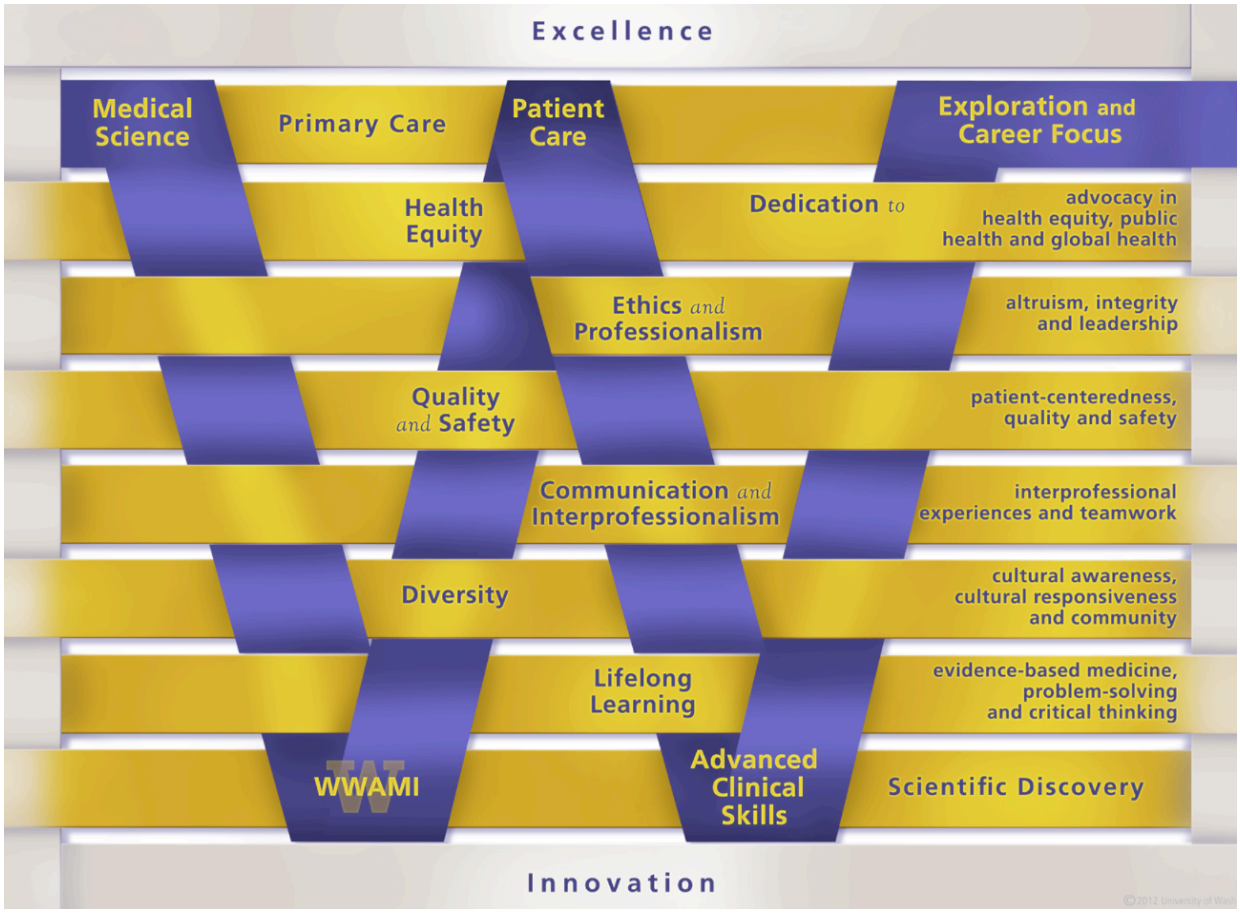
WWAMI Map of all Regional Education Sites (2016-2017)



Source: WWAMI program site map, 2016-2017. Reprinted from UW Medicine, In *WWAMI Education,* 2017, Retrieved November 17, 2017, from https://www.uwmedicine.org/education/Documents/WWAMI-Program-Sites_5-State-Map.pdf.

APPENDIX N

University of Washington School of Washington's (UWSOM) Curriculum Themes and Threads



Source: Fabric of the University of Washington School of Medicine curriculum. Reprinted from Curriculum Renewal, In *UWSOM Curriculum,* 2015, Retrieved November 2, 2017, from https://www.uwmedicine.org/education/md-program/current-students/curriculum/curricu lu m-renewal

VITA

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