

STUDENT-LED DESIGN OF A MEDICAL EDUCATION TRACK AND DISTINCTION:
PROVIDING AN OPPORTUNITY FOR MEDICAL STUDENTS TO TRANSFORM INTO
KNOWLEDGEABLE CLINICAN EDUCATORS

by

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DISSERTATION

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ABSTRACT

STUDENT-LED DESIGN OF A MEDICAL EDUCATION TRACK AND DISTINCTION: PROVIDING AN OPPORTUNITY FOR MEDICAL STUDENTS TO TRANSFORM INTO KNOWLEDGEABLE CLINICAN EDUCATORS

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Background: *Throughout their careers, physicians at all stages of training and practice are charged with the responsibility of educating the next generation of physicians, peers and colleagues, as well as patients and their families. Despite the fact that a significant role of being a physician is being an educator, there is limited formal training for developing physicians as strong Clinician Educators.*

Objective: *Through the development and implementation of a Medical Education Track and Distinction, we aim to provide a platform for interested medical students to grow in their knowledge related to medical education, their teaching skillsets, and their ability to conduct sound medical education research.*

Methods: *The Medical Education Track and Distinction encompasses three Medical Education courses, scholarly activity in medical education, and an optional Distinction in Medical Education. The track's overall success, has been measured by student and faculty involvement. The Medical Education courses are evaluated by student surveys that utilize a five-point Likert scale and solicit student comments about the courses.*

Results: *There have been over forty student and twenty faculty participants to date. The majority of survey responses have been positive with most students strongly agreeing or agreeing that the courses have increased their knowledge about key topics in medical education and improved their teaching skills. Approximately 4.6% of the first class to complete the scholarly activity has expressed interest in the medical education track, and in the first year student are eligible to graduate with an M.D. with Distinction in Medical Education, three students have met the requirements.*

Conclusion: *The development and implementation of the Medical Education Track and Distinction at UT Southwestern aims to fill a current gap in medical education that exists in teaching future physicians how to be effective educators. The positive interests and results from this curriculum demonstrate that medical students are interested in learning how to teach and that medical school provides a feasible platform for beginning the development of future physicians as strong clinician educators.*

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CHAPTER 1 – INTRODUCTION

Throughout their training and career, many physicians are charged with the responsibility of not only caring for their patients, but also helping to train the next generation of physicians. As medical students embark on the journey to become physicians, they are encouraged and often required to assist with teaching their peers, colleagues, patients, and families. Thus it seems critical that students develop the knowledge and skills necessary to become effective educators. Medical education currently provides a strong foundation in medical knowledge, but few opportunities exist for medical students to train to become effective educators early in their medical training. This issue was explored by Hamso and colleagues, who surveyed 130 medical schools in the United States, with a response rate of 76%. Their twenty-three item survey explored medical student involvement in teaching versus formal medical education training opportunities available at the respective institutions. All medical schools confirmed that they used their students as teachers, but only 44% had formal Student as Teacher curricula. Ninety-five percent of schools had some type of training in the fourth-year of medical school, but the diversity of time-commitment, structure of courses, and evaluation of programs varied greatly.¹

In a review of the wide variety of currently available programs across the country, three major categories exist for Student as Teacher curricula: medical interviewing and physical diagnosis, basic science teaching, and faculty development courses. Themes common to many programs include availability of most programs during the fourth-year of medical school, with few programs providing a longitudinal experience. Evaluations are usually limited to the Likert scale and student involvement is generally structured so that fourth-year students are teaching first-year or second-year students.² Additionally, a review by Marton and colleagues highlights the fact that most available programs in which students can teach focus solely on learner progress as opposed to teacher progress, with limited quantitative measurement of teaching-related outcomes in the medical education literature.³

Institutions with programs of varying degrees of student commitment will be subsequently discussed to provide an overview of currently available programs at medical schools around the world, as they have been described in the currently available literature. At

the University of California San Francisco, students participate in a four-hour course titled “Teaching to Teach”. The four topics covered in the course are teaching methods, fair evaluation of students and feedback, challenges of teaching as an intern, and practicing teaching skills in a small-group setting. This course is unique in that it is incorporated into the required curriculum, designed for a larger audience, and presented in a shorter format. Interestingly, this course solicited feedback from participants during the last month of their internship and the published report covers the first six years of experience with this course. When students were asked if the course prepared them to teach during residency, 85% agreed or strongly agreed based on a five-item Likert scale survey.⁴ This demonstrates that even a short course can have a positive impact on advancing students as clinician educators.

Another medical education course with significant post-participation follow-up was conducted at the American Medical Student Association conference titled “Training Tomorrow’s Teachers Today.” The research study asked whether participating in a five-day teacher-training program led to improvement in student teaching skills. This program was largely based on the Stanford faculty development program, the Harvard Macy Program for Clinician Educators, and the Midwest Academy. It focused on learning effective teaching techniques, developing leadership skills, and creating a committee of student leaders in medical education. Twenty-four students participated and received a two-year post intervention survey. Fifty-percent submitted a response with all respondents indicating that they applied what they learned in the course to their teaching encounters.⁵ Smith and colleagues discuss this retreat and highlight that it fills a current void in medical education. With increasing time pressures on faculty and residents, perhaps the best time for developing medical professionals into excellent educators is during medical school.⁶

A slightly different approach was adopted by the Sydney Medical School, which developed an evening course titled “Teaching on the Run”. The course is comprised of six three-hour sessions and includes topics pertaining to understanding basic educational principles, planning educational activities and lectures, and providing constructive feedback to peers. Seventeen medical students completed the course and seven students subsequently participated in a focus group to discuss their experiences with the course. Most students in this course stated that they had never been formally taught how to teach or supervise students.

The instructors also utilized a pre- and post-test to show that students reported an increase in perceived ability to apply basic education principles.⁷

A week-long fourth-year elective is available at the University of Massachusetts titled “Teaching and Learning in Residency: Maximizing Your Experience.” During the first two days of the course, students learn to assess learner needs, establish goals and objectives, understand clinical teaching methods, and explore how to facilitate small-group teaching. Subsequent sessions include focusing on skills for self-assessment, teaching procedures, giving and receiving constructive feedback, building teams, and understanding leadership styles. The course concludes with a teaching presentation, 10-20 minutes in duration, which provides students with the opportunity to immediately watch the session with feedback from a facilitator and other participants in the course. At the time of publication, the course had 27 participants and 93% completed an evaluation. When comparing pre- to post-test results, students reported an increase in their teaching confidence level and showed a significant increase in their ability to provide meaningful feedback.⁸

A program of similar duration and content is available at the University Medical Center in Utrecht in the Netherlands, but differs in that it is a required part of the medical school curriculum in the final year. When students complete the required one-week program, they can subsequently participate in an elective rotation that is six weeks in duration. During the elective, they serve as teachers in a curriculum unit for a course they have completed, with weekly meetings to assess progress. During their fourth week, students take a test and compose a teaching portfolio. Although this is an elective, it is a graded component of the curriculum and students can get a teaching qualification if they complete thirty independent teaching hours. Strikingly, results show that student teachers were evaluated by student learners to be equal to or slightly better than faculty teachers.⁹

The majority of currently available literature discussed so far focuses mainly on teaching in the classroom and small-group settings. Demonstrating that developing medical educators is not simply restricted to the classroom setting, students at Columbia developed a model to incorporate medical education training into Columbia’s University’s Student-Run Clinic. Teacher-learner dyads were created among participants at the clinic. A paired interview was subsequently conducted, followed by individual interviews to allow for private

reflection. Consistent themes from teachers during the follow up interviews included the difficulty of balancing good patient care and learner education, the fact that the teachers felt appropriately challenged by their near-peer learners, and that teaching improved their confidence in their own clinical skills. Overall the learners felt that the best student teachers adjusted their teaching to the learner's current skill and knowledge level, were consistently open to questions, and were patient when the learner was struggling.¹⁰

A similar structure was adopted in the reciprocal peer-teaching protocol used for the Medical Gross Anatomy Laboratory at the New York College of Osteopathic Medicine where students alternate being teacher and learner. This is truly a peer-teaching experience with teachers and learners being at the same educational level. This is a unique educational intervention, which not only provides an opportunity for students to develop their teaching and communication skills, but also addresses specific challenges faced by this institution of increasing class sizes, limited anatomy cadavers, and lower numbers of available instructors. When analyzing 127 student responses, more than 80% of students felt that the reciprocal peer teaching should be continued in the anatomy laboratory and 67% expressed that they are more confident when presenting material due to participating in the course.¹¹

Similar to the anatomy laboratory challenges discussed by Bentley and colleagues above, another component of medical education curriculum that often faces resource challenges is standardized patient evaluation through Objective Structured Clinical Encounters (OSCEs). Blatt and Greenberg describe the Teaching and Learning Communication Skills Course (TALKS Course) available at George Washington University School of Medicine. A unique component of this course involves students training to be standardized patients.¹² This approach can not only address resource challenges faced by many schools when conducting OSCE examinations, but can also develop participants' understanding of structured clinical encounters and their utility in medical education.

Standardized encounters are also evolving as more clinician educators recognize the value of training students to be effective teachers. Although initially used in a clinical context, objective encounters are now also being incorporated into teaching skill evaluation. Objective Structured Teaching Encounters (OSTEs) are gaining recognition as valuable training tools. At the University of California, Irvine, a sixty-hour service elective covers a

variety of concepts, with the most well-rated experiences being peer teaching classes and OSTE practice sessions. The medical school service elective collaborates closely with the institutional Resident as Teacher program. Medical students serve as standardized learners in the OSTE, while residents serve as teachers in the encounter. Faculty members subsequently evaluate and discuss student and resident participation.¹³ OSTE is not only utilized at the medical student or resident level. Trowbridge and colleagues reviewed twenty-two relevant articles and argue for the utility of OSTE in evaluating specific teaching competencies for clinical teaching faculty.¹⁴

After reviewing the currently published Medical Student as Teacher programs, the literature was searched to address the critical question of what makes an effective educator. Sutkin and colleagues performed an extensive analysis to address this topic. An initial focus group identified five common themes that successful educators are thought to possess: ability to form relationships, emotional activation of students, generativity, self-awareness, and competence. Subsequently Sutkin and colleagues performed a thorough literature review, including twenty-six articles published before 1966 and forty-two articles published after 1966.¹⁵ The articles included essays and surveys of students, residents, or colleagues. The three overarching categories identified in this literature review that effective medical educators possessed were roughly split between physician characteristics, teacher characteristics, and human characteristics. Within these categories, the most commonly reported themes included medical and clinical knowledge, clinical and technical skill competence and reasoning, positive relationships with students and a supportive learning environment, communication skills, and enthusiasm of the clinician educator. Strikingly, two-thirds of descriptions and themes identified were non-cognitive characteristics, leading the authors to the conclusion that “perhaps what makes a clinical educator truly great depends...more on inherent, relationship-based, non-cognitive attributes.”¹⁵

In addition to understanding what makes an effective educator, it is critical to understand factors that contribute to student motivation. A survey conducted with students participating in the Student Support Network at Columbia explored student awareness of the connection between teaching and being a physician. Main motivators included a sense of obligation to the program, to review the material, or simply because they enjoyed teaching.

Strikingly, none of the students surveyed wanted to teach because of the importance of teaching later in their career.¹⁶ However, as early as their first year of residency, residents may spend 20-25% of their time teaching and internal medicine program directors estimate that up to 62% of student learning is attributed to residents in the inpatient setting.¹⁶⁻¹⁸ As students advance through their career, they transition from teaching their peers to teaching patients and their families, creating a link between skills gained in the realm of medical education and direct clinical practice. If students become aware of the significance of teaching as it relates to clinical practice, perhaps they can take advantage of medical education training opportunities to not only improve their teaching skills, but also impact their future patients. The interplay between teaching and clinical practice was explored by Dandavino and colleagues, who highlighted three reasons for formal training in education:

(1) medical students are future residents and faculty members and will have teaching roles; (2) medical students may become more effective communicators as a result of such training, as teaching is an essential aspect of physician–patient interaction; and (3) medical students with a better understanding of teaching and learning principles may become better learners.¹⁷

Despite the critical link between medical education and future clinical practice, there is still limited literature and research on the impact of formal training programs in medical education. The opportunities to incorporate these programs into current medical education are vast and include brief teaching points within current curriculum, elective opportunities, formal tracks, and courses for transcript credit.¹⁷

The above principles and programs largely impacted the development of a comprehensive longitudinal training program in medical education at the University of Texas Southwestern Medical School (UT Southwestern). The primary goal of establishing a medical education track and distinction is geared toward achieving early exposure to the field of medical education. Secondary aims include developing or reinforcing basic teaching skills and expanding student knowledge of research methods in medical education, through both lecture-based curriculum and project development and implementation. The basic foundation developed through this program and continual reinforcement of the clinical relevance of being an effective teacher will prepare students to not only teach their peers, but also provide the best care for their patients throughout their medical career.

CHAPTER 2 – METHODS

Overview of UT Southwestern Curriculum: Setting the Stage

In August of 2015 UT Southwestern implemented a new curriculum entitled “The Foundation of Excellence Curriculum.” With this new curriculum there is an eighteen-month Pre-Clerkship period during which students have three semesters of primarily classroom based learning divided into three blocks. Blocks I (Body Structure Foundations) and II (Fundamentals of Biomedical Science) are covered during the first Pre-Clerkship (PCI) semester. Together these blocks aim to provide students a foundation of knowledge that they can build upon as they progress through Block III (Integrated Medicine: Health to Disease) during the second (PCII) and third (PCIII) Pre-Clerkship semesters.¹⁹ An important component of this new curriculum is that students continue to have a ten-week summer break during which time they are encouraged to explore their personal interests in medicine through a variety of activities available on or off campus.

Following the Pre-Clerkship period, students enter an eighteen-month Clerkship period during which time they have a six-week study period to prepare for the USMLE Step 1 exam, a twelve-week period to complete a scholarly activity, and a forty-eight-week period to complete their required clerkships. Students are required to take the six-week Step-1 study period at any time during the first six months of the Clerkship period. The twelve-week scholarly activity was implemented in the new curriculum because curriculum developers strongly felt that, “a required scholarly activity, under the guidance of a faculty mentor, fosters students’ analytical skills, enhances self-directed learning and oral and written communication skills, and ultimately trains students to be better physicians.”²⁰ Students complete their scholarly activities in one of seven tracks: basic research, biomedical innovations, clinical and translational research, community health, global health, medical education, or quality improvement. In terms of required clerkships, students must complete six weeks of Ambulatory Care, four weeks of Family Medicine, eight weeks of Internal Medicine, four weeks of Neurology, six weeks of Obstetrics and Gynecology, six weeks of Pediatrics, six weeks of Psychiatry, and eight weeks of Surgery.²⁰

Finally, during the fourth year, students progress into the ten-month Post-Clerkship period. During this time, students are required to take two “selectives” providing sub-internship and intensive care experience. They are also required to take a Frontiers in Medicine course, Transitions to Clinical Training course, and Physicians and Society course. The remaining months are used for four elective courses and residency interviews.

Also pertinent to the development and implementation of the Medical Education Track and Distinction at UT Southwestern is the existence of Enrichment Electives. Enrichment Electives are traditionally courses developed by students in various areas of interest to expand learning opportunities beyond the required curriculum. Popular current Enrichment Electives include: Art of Observation, Global Health, Quality Improvement and Patient Safety, and Health Care Economics. The courses are not for credit but students do receive transcript acknowledgement documented as a “pass” upon completion of the course. Standard requirements for creation of an elective include identification of a faculty mentor and student representative, identification of faculty teachers, assessment of student interest, and submission of the course syllabus describing a minimum of twelve hours of course activity to the Preclinical Electives Committee for approval. For students to earn transcript notation for completion of the elective, they are required to participate in at least ten of the twelve hours of course activity and complete the course evaluation survey. Depending on the specific elective, there may be other attendance and/or project requirements.

Medical Education Track Overview

The Medical Education Track and Distinction at UT Southwestern has been designed to be an in-depth, longitudinal experience that explores gradually advancing topics across the four-years of medical school (*Figure 1*). We believe that by engaging medical students interested in medical education at the start of their medical career, a medical education track and distinction will provide a platform for these students to develop their knowledge related to key medical education topics, their teaching skill set across multiple settings, and their ability to conduct sound medical education research. Key outcomes measured to assess these objectives and goals include student participation in the track and participant surveys.

The track begins with Medical Education I, which is offered in the PCII semester, and

serves to provide interested students with a basic exposure to Medical Education, Clinician Educator tracks in academic medicine, and basic skills of effective educators. Then during the summer between the PCII and PCIII semesters, students are encouraged to participate in a medical education related activity, such as a teaching experience offered on campus, a medical education research project, or a medical education quality improvement project. During the PCIII semester, students take Medical Education II, which primarily focuses on medical education research and prepares students for the scholarly activity in medical education. It also explores more advanced topics in medical education. As outlined above, during the clerkship period, all medical students are required to complete a scholarly activity and those participating in the Medical Education Track complete their scholarly activity in medical education. Next, during the Post-Clerkship period, students can take Medical Education III. The overall purpose of this course is to provide experiential learning and practical teaching experience for participants. It also serves to round out exposure to various topics felt to be critical to a well-rounded medical educator that have not been previously covered in Medical Education I or II. Finally, students have the option of applying for and earning a formal Distinction in Medical Education to be awarded upon graduation. The curricula for the Medical Education I through III courses, as well as the requirements for the distinction, are outlined in detail below.

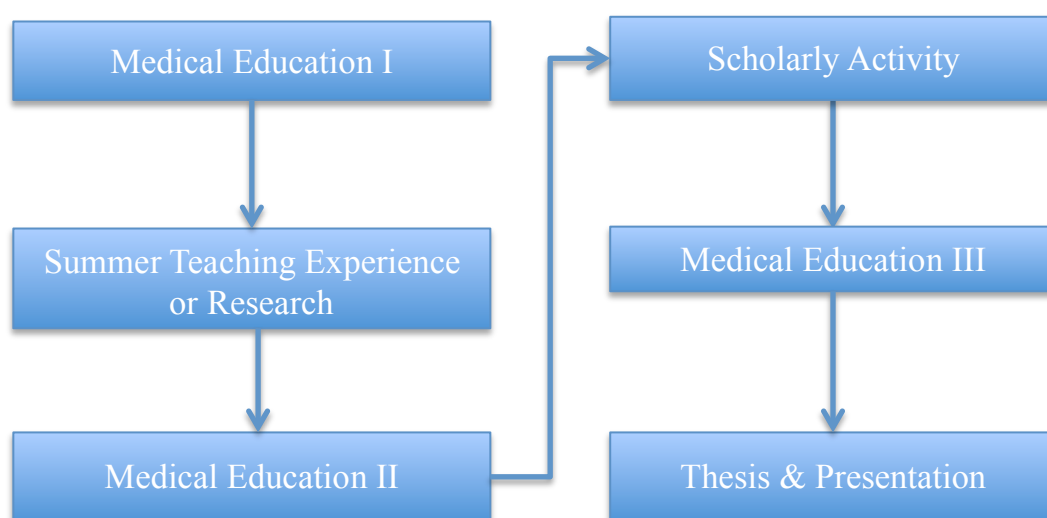


Figure 1. Medical Education track and distinction curriculum pathway.

Methods of Instruction

The Medical Education I and II courses are offered as Enrichment Electives. Class sizes for Medical Education I have ranged from approximately 10-40 students in any given session. Class sizes for Medical Education II have ranged from approximately 5-15 students. Teaching in these courses is primarily small group and lecture-based. A point was made during course development to have at least two of the sessions designed to be an interactive, workshop format.

With regards to the scholarly activity, most of the education is provided on a one-on-one basis between the student mentee and the faculty mentor. Leading up to the start of the scholarly activity period, students are required to submit a project proposal outlining the goals and aims of the project. The project proposal also serves to identify whether any additional training or compliance education is needed prior to initiation of the project. Additionally, the didactic component of the Medical Education Scholarly Activity overlaps with those topics covered in the Medical Education II elective. Notably, participation in the Medical Education I and II electives are not prerequisites for participation in the Medical Education Scholarly Activity; however, those students who do complete the Medical Education II elective are exempt from the scholarly activity didactics.

The Medical Education III course is led by a faculty member with expertise in medical student education. In this course students receive instruction through small group lectures and discussions as well as one-on-one advising from faculty mentors supervising student projects.

Finally, for the written thesis and presentation of scholarly work, the Program Coordinator for Medical Student Research, Scholarly Activities, and Distinctions provides written instructions and guidelines to students. Students are then guided through the process and feedback is provided by their self-selected thesis committee, which consists of a minimum of three UT Southwestern faculty members.

Medical Education I

The Medical Education I course is offered as a Pre-clerkship Enrichment Elective in the PCII semester. The course's two main goals are to provide students with introductory

knowledge to pertinent topics in medical education and to begin teaching students skills that are critical to becoming an effective educator. This is done through eight one-hour small group lecture/discussion sessions and two two-hour interactive workshops. Specific course topics and learning objectives are:

Introductory Material for Future Medical Educators

- Introduction to Clinical Educator Tracks in Academic Medicine – Introduce students to different ways physicians can become involved in medical education in the academic medical setting (curriculum reform, basic science/pre-clinical education, clerkship director, resident/fellow training); introduce the basics of curriculum design; discuss general pathways to becoming a clinical educator; discuss additional degrees and/or certifications that can potentially be sought.
- The Psychology of Learning/Introduction to Learning Modalities – Provide a general introduction to learning theory; define different learning modalities used in medical education, the research behind these methods, and correlation with learner test/assessment scores; discuss individual learning styles and how each learning modality effects each learning style.
- Research Methods in Medical Education – Apply learning theory to research design; develop the ability to generate testable hypotheses for research on medical training and education; discuss bias and confounding factors and how to avoid them; discuss potential regulatory processes necessary to complete medical education research (e.g. IRB approval).
- The Role of Simulation in Medical Education – Discuss emerging technology for medical simulation; discuss the value of simulation as it relates to effectiveness in educating students and clinical outcomes; develop a basic understanding about design of simulated patient care.
- Generational Diversity in the Medical Field: How it Influences our Learning Environment and How it Should Influence our Teaching Style – Describe and contrast the general characteristics of the generations currently in healthcare; discuss the impact of these characteristics on

teaching, learning, and expectations in the work environment; describe the foundation for the characteristics noted in the Millennial generation and potential impact on teaching and learning methodologies as well as professionalism.

- Inter-professional Education – Develop an understanding of the different scopes of knowledge and practice of different medical professionals; gain an understanding of the objectives and goals of the different professions; discuss ways to best educate colleagues from different fields.

Basic Skills for Future Medical Educators

- Effectively Communicating With and Teaching a Specific Audience – Discuss how to teach to the knowledge level of your audience; provide students with examples of effective versus ineffective communication tools; develop an understanding of how to create a talk that facilitates the audience's ability to understand a complex and/or detailed topic (how to “see the forest for the trees”).
- Giving Effective Feedback – Discuss the different timing of various forms of feedback; describe the components of effective feedback and how to incorporate learner self-evaluation; discuss the importance of effective feedback.
- Teachable Moments: Bedside Teaching and Education in the Ambulatory Setting – Explore ways to effectively discuss interesting aspects of a clinical case at the bedside with members of the healthcare team while keeping the patient in mind; discuss how to take away learning points from situations involving student or physician error while avoiding assigning blame.
- Testing and Evaluation of Students – Discuss the pros and cons of various testing modalities; have students practice writing a multiple choice test question; discuss methods for incorporating student feedback into future test questions and/or score adjustments.

- Workshop: Creating an Effective Presentation – Provide students with the tools necessary to compose objectives and establish the relevance of the topic being taught; describe the key features of a successful presentation or teaching session; emphasize the importance of organization and clarity in creating educational material that enhances learner understanding and knowledge acquisition; discuss different methods for making the presentation and material memorable. Students are required to bring background information on a topic of their choice. After the lecture portion of the session, students will break into small groups and create a three to four slide presentation in order to practice implementing these skills.
- Workshop: Generating Interest and Displaying Enthusiasm – Discuss with students how to generate learner interest in difficult topics or those that seem to have limited clinical relevance; allow students ten to fifteen minutes to create a one minute talk that generates audience excitement and enthusiasm about an everyday object or topic.

Summer Medical Education Experiences

As described above, with the eighteen-month pre-clinical curriculum at UT Southwestern, students have a ten-week summer break between the PCII and PCIII semesters. During this period students often use their time to pursue scholarly activity in an area of interest or pursue preceptorships in order to continue developing their clinical skills. A majority of students participate in basic science, translational, or clinical research either on campus or at another academic medical center. Students who are interested in the medical education track, and more specifically, the distinction, are encouraged to participate in a longitudinal medical education experience over the summer. Students are able to begin a research project or a quality improvement project related to medical education that they could then continue to work on during their scholarly activity period. There is funding available through the institution's Medical Student Summer Research Program that they may apply for. Additionally, at UT Southwestern, there are two well-established programs and a number of other part-time teaching opportunities that interested students can participate in, which allows

them to begin applying the knowledge and skills they were introduced to in Medical Education I and gain invaluable teaching experience. The programs currently available are:

Health Professions Anatomy Teaching Assistant: The School of Health Professions offers their anatomy course for Physician Assistant, Physical Therapy, and Prosthetics and Orthotics students during the summer. Medical students who excel in their anatomy course are eligible to apply for a Teaching Assistant (TA) position for the Health Professions anatomy course. This is a full-time ten-week teaching opportunity in which TAs help teach the laboratory component of the course through three three-hour dissection sessions per week plus an additional one-hour laboratory help session per week. TAs in this program not only enhance their teaching skills through helping students during laboratory sessions but also gain experience in testing. TAs help set up and grade three laboratory exams and serve as proctors for laboratory and lecture exams.

Joint Admissions Medical Program (JAMP) at UT Southwestern: JAMP is a unique program in Texas that serves to provide support and encouragement to “highly qualified, economically disadvantaged Texas resident students pursuing a medical education.” The program provides financial support for undergraduate education, summer programs, and MCAT preparation. Academically, it provides students with clinical experiences during their undergraduate career and personal and professional development through an established mentorship program.²¹ UT Southwestern medical students have the opportunity to serve as mentors for undergraduate students who are assigned to UT Southwestern for their one-month Summer Internship experiences. As a mentor for the JAMP program, medical students gain experience in advising colleagues at earlier stages in their medical career as well as direct teaching experience. In terms of advising, medical student mentors stay with program participants at a local hotel and are available to address any questions or concerns participants may have including, but not limited to, insights into what life in medical school is like and how to do well in medical school interviews. With regards to direct teaching experience, medical student mentors are responsible for teaching the program participants either biochemistry or anatomy over the course of the month. Mentors are provided with the previous year’s presentations and notes as a foundation but are encouraged to improve the material presented, the resources provided, and how the information is presented.

Part-time Teaching Opportunities: There are two common part-time teaching opportunities that students interested in teaching frequently pursue, especially if they desire to teach in addition to having a summer research project. First, there are tutoring opportunities available through Student Academic Support Services. As a tutor, students help peers remediate coursework they did not pass during the academic year. Typically, there are opportunities available for up to twenty students to gain teaching experience through tutoring. The second opportunity is with the UT Southwestern STARS (Science Teacher Access to Resources at Southwestern) program. Over the summer there are a number of undergraduate, high school, and middle school students who come to UT Southwestern to participate in one of the STARS programs. These programs provide a wide range of opportunities for visiting students including, but not limited to, research opportunities and educational experiences in biology, chemistry, or physics.²² Medical students interested in working with these students have an opportunity to volunteer through the STARS program where they are able to talk with students about the medical school experience as well as teach activities such as suturing and performing the physical exam.

Medical Education II

The Medical Education II course is, again, offered as a Pre-Clerkship Enrichment Elective in the PCIII semester. This course is primarily designed to introduce students to research in medical education and provide a strong foundation for students as they prepare for their scholarly activity. Secondarily, the course aims to continue to provide students knowledge about key concepts and skills instrumental in becoming an effective educator. This is done through nine one-hour small group lecture/discussion sessions and two one-and-a-half hour workshops. Additionally, students are expected to meet with their identified faculty mentor and with the track director to ensure they are progressing as expected. Specific course topics and learning objectives include:

Research Topics for Future Medical Education Scholars

- Orientation to the Medical Education Scholarly Activity, Track, and Distinction – Orient students to the medical education scholarly activity and the M.D. with Distinction in Medical Education; provide an overview of the

mentor-mentee relationship and expectations for both mentors and students; provide students with a list of available faculty mentors along with a brief description of their academic interests as it relates to medical education.

- Research Methods in Medical Education – Develop an understanding of the most common research methods used in medical education; explore differences between research in medical education and other types of research; review examples of medical education literature examining the strengths and weaknesses of various types of studies.
- Generating a Hypothesis in Medical Education – Understand the key components of a successful hypothesis; explore the importance of a clear hypothesis on a research project; learn the various types of hypotheses and how they can be applied to different medical education projects.
- IRB for Medical Education – Discuss the components of a comprehensive IRB research application; understand the types of projects that require IRB approval; provide students with an understanding of the timeline required for IRB approval; understand when changes to study designs need to be submitted for re-approval.
- Quality Improvement in Medical Education – Learn how to identify components of a curriculum in need of improvement; gain the ability to generate a goal-directed quality improvement project; understand the difference between quality improvement and other types of research.
- Workshop: Scholarly Activity Proposal I – Provide students with examples of scholarly activities in medical education; discuss an approach to developing ideas for a scholarly project; brainstorm ideas for a scholarly activity with classmates; begin to develop objectives and project goals.
- Workshop: Scholarly Activity Proposal II – Begin work on generating a hypothesis and outlining research methods; determine whether the project will need IRB approval; brainstorm possible impact and long-term outcomes of project; develop a tentative timeline for completion.

Intermediate Topics and Skills for Future Medical Educators

- Curriculum Design – Identify the components of a successful curriculum; discuss challenges faced during the implementation of a new curriculum; learn ways to evaluate a newly implemented curriculum and the importance of flexibility and adaptability during the initial phases of implementation.
- Competency-Based Medical Education – Review the medical education competencies as the building blocks of curriculum; understand how the competencies are incorporated into curriculum development; discuss how students are evaluated based on core competencies.
- Assessment and Evaluation of Teaching and Learning – Be able to describe various assessment modalities and how they are used currently in medical education (including, but not limited to, multiple choice questions, TBLs, short answers, essays, verbal assessments); gain the ability to evaluate the effectiveness of assessments; understand the importance of tracking assessment performance; discuss the ways assessment performance should be used to guide future teaching approaches.
- Effective Survey Design – Gain the ability to solicit feedback through surveys; discuss the types of questions that can be incorporated into a survey; understand how to appropriately choose question types based on the information the educator is trying to solicit; understand how to compile comprehensive feedback data and how to analyze survey results.

Scholarly Activity

As described in the UT Southwestern curriculum outline, with the implementation of the “Foundations of Excellence” curriculum, all students are expected to complete a scholarly activity (SA) during their eighteen-month clerkship period. Three months prior to the start of their SA period, students are expected to identify their mentor and select a topic. Two months prior to their SA block, students are required to submit a project proposal to the track director. Students are then ready to complete their SA block, which amounts to twelve weeks of full-time work on their project.²⁰

The SA is a graded component of the curriculum with a three-tier, honors/pass/fail grading system. Student grades are determined by their performance during the SA period as assessed by their mentor (60%) and a final SA summary (40%) graded by the track director. The final SA summary is a five to ten page document describing the project including sections on introduction/background information, methods, results, and discussion. The SA summary is then turned in to the track coordinator on the last day of the block.²³

For the SA in medical education, students are encouraged to develop projects related to implementation and or evaluation of new curricula or new educational technology, evaluation and quality improvement of existing teaching activities, or a medical education literature review in an area of interest.²⁴ Specific areas of interest for track mentors include, but are not limited to: simulation training for communication skills, team-based learning, simulation and surgery education, medical education technology, physician-physician handoffs, spirituality in medicine and reflection as a teaching tool, development of a cultural competencies curriculum, and generation and evaluation of an assessment rubric for self and faculty feedback of clerkship students.

Medical Education III

The Medical Education III course is offered as a Post-Clerkship elective, which can be used to fulfill one of the elective graduation requirements. It is a four-week course offered during the fall semester of the fourth year. The main goal of this course is to provide students with experiential learning opportunities in medical education. First, students are required to develop an interactive learning module to be implemented in either the pre-clinical or clinical setting. With the help of the Course Director, students identify a field and topic of interest as well as a specific faculty mentor for the project within their desired field. They then create learning objectives, a session outline, and ultimately develop the curriculum for the session. Students are also encouraged to brainstorm and consider ways to measure success of their curriculum once implemented.

Secondly, students gain direct teaching and advising experience during this course. Students again explore their personal interests as they relate to medical education and identify teaching sessions that are an already established part of the curriculum that they would like to

teach. They then reach out to the faculty member instructor(s) to assess their willingness to have medical student participation in the session. Students are then evaluated by the course director (or his/her designee) and the faculty member instructor on their teaching skills and immediate feedback is given. In terms of advising, fourth-year track participants are expected to serve as a mentor for colleagues at earlier stages in the track, specifically as it relates to generating scholarly activity proposals in the Medical Education II course.

Finally, students continue to expand their knowledge in medical education through eight small-group teaching sessions. Topics covered include: Revisiting Clinician Educator Tracks in Academic Medicine – What to Look for in Residency Programs, Educational Administration, The Role of Simulation in Medical Education, Inter-professional Education, Incorporating Technology in your Teaching, Microskills of Teaching – The One Minute Preceptor, Educating a Lay Audience, and Creating an Educator's Portfolio. Students are expected to take what they have learned from the educator's portfolio session and apply it to the creation of their own portfolio to be turned in to the Course Director by the end of the course.

The course is graded on a two-tier, pass/fail system. Student grades are determined by their overall participation, quality of the interactive learning module developed, completion of the required teaching sessions, and the completion of their educator's portfolio.

Distinction

UT Southwestern offers seven M.D. with Distinction programs in each of the SA tracks outlined previously. The purpose of the M.D. with Distinction programs is to acknowledge students who “distinguish themselves in their scholarly pursuits above and beyond those that all medical students are expected to accomplish during their medical school experience.” Applications for the Distinction are due by January 1st of the year preceding graduation and include the scholarly activity project proposal, plans for meeting the distinction requirements, an updated CV highlighting activities in the track, and a proposed thesis committee consisting of at least three UT Southwestern faculty members, one of which is the student's faculty mentor. Across all tracks, to earn a Distinction, students must complete twenty-four weeks of full-time work in their area of focus. For most students, this

will include an eight-week summer experience between the PCII and PCIII semesters, the twelve-week scholarly activity block, and the four-week Medical Education III elective. Additionally, students are required to submit and defend a written thesis to their committee. The thesis is required to be a minimum of thirty pages and should cover the project rationale, methods, outcomes and results, conclusions, and recommendations for future work. Lastly, students are required to disseminate their work in one of four ways: submission of a manuscript (with the students listed as one of the authors) to a peer-reviewed journal, presentation of an abstract of the student's work at a regional or national meeting, presentation of the student's work at a campus wide conference at UT Southwestern, or submission of a patent application resulting from the project work.¹⁹ For students specifically interested in pursuing an M.D. with Distinction in Medical Education, the only additional requirements are completion of the Medical Education I through III courses.

Evaluation of Medical Education Track and Measures of Success

Initial evaluation of student interest prior to initiation of track and distinction design was conducted through email and survey-based methods. The initial survey simply asked students if they would be interested in participating in an elective focused on Medical Education. The ongoing success of the track is currently being measured by the level of student and faculty participation. The number of students participating in each phase of the track is monitored through course enrollment and attendance. At the conclusion of each course, students are sent an online survey that aims to assess their overall satisfaction with the course, whether or not the course met its stated learning objectives, and assessments of each of the lectures/workshops. Standard evaluation of campus electives is based on anonymous surveys that integrate a five-point Likert scale. The Likert scale used includes the following answer choices: strongly agree, agree, neutral, disagree, and strongly disagree. For the purposes of statistical analysis, strongly agree is assigned a numerical score of 5. Strongly disagree is assigned a score of 1. This data is then analyzed to determine the average student response and standard deviation. This method of evaluation mirrors elective evaluation on the UT Southwestern campus currently and also mirrors evaluation of medical education programs in the current literature.^{4,11,25} At the end of each survey, students are encouraged to

leave comments about the course overall, its strengths, and its areas for improvement. Survey questions are updated annually to reflect current course content and the curriculum is amended based on faculty and student feedback.

CHAPTER 3 – RESULTS

Global Track Interest and Participation

To begin, a survey was sent out to all medical students at UT Southwestern in order to assess overall interest in the development of a Medical Education elective, which would serve as the initial foundation for the development of the track and distinction. Seventy-one students responded to the survey indicating their interest, demonstrating that the conception of this elective was warranted. Subsequently, the program has expanded to include more than forty students across the various track activities. To date, thirty-five students have participated in the Medical Education I Enrichment Elective over the course of two years. Twelve students participated in the Medical Education II course in the first year the course was available. Eleven students have registered for the Scholarly Activity focusing on Medical Education and three students have completed the pilot month-long Medical Education III Elective.

Medical Education I Enrichment Elective

The first version of the Medical Education I Enrichment elective (2014-2015) was evaluated with a nine-question Likert scale survey. Seventeen students completed the survey. All survey questions had a mean response above 4.35 and standard deviation less than 0.77. When students were asked to respond to the statement “I feel that I have gained a better understanding of issues related to medical education”, 70.6% of students expressed that they strongly agree (mean = 4.71, st. dev. = 0.45). The majority of students (70.6%) also strongly agreed that they would recommend this course to other students (mean = 4.59, st. dev. = 0.77). The lowest rated question related to course organization. Forty-seven percent of students strongly agreed that the course was well organized (mean = 4.35, st. dev. = 0.76). The remainder of the results are detailed in Table 1. The qualitative comments highlighted that areas for improvement include scheduling conflicts with other courses or lectures, some redundancies between lectures, and a desire for more hands-on teaching experiences. Students also expressed an interest in having more workshops incorporated into the curriculum. The most highly praised components of the course included the lecture on

generational diversity in medicine, the enthusiasm of the lecturers, and the discussion of clinician educator tracks. Students also felt that the lecture topics were very comprehensive.

The second year the course was offered (2015-2016), the survey was expanded to include twenty general survey questions (n=18) followed by fifteen survey questions specific to individual lecture objectives covered in the course (n=17). The number of lecture-specific responses varied slightly due to variability in student attendance during each lecture. Overall, fewer students agreed with the statement that they would recommend the course to other students (mean = 4.06, st. dev. = 0.91), but the response to overall course organization was similar (mean = 4.22, st. dev. = 0.53). In terms of specific lecture based questions, students rated the session on learning objectives the highest with survey results showing that 94.5% of respondents strongly agreed or agreed that they are able to develop an effective learning objective and that they understand the difference between a learning objective, learning goal, and learning mission (mean = 4.17, st. dev. = 0.69). The lowest rated question assessed the learning objective of understanding the utility and limitations of various teaching methodologies (i.e. behaviorism, cognitivism, etc.) in constructing a learning objective (mean = 3.78, st. dev. = 0.58). The remainder of the results for the second year of Medical Education I (2015-2016) are summarized in Tables 2 and 3. The student comments for the second year Medical Education I enrichment elective were similar to the first year and again highlighted similar strengths in lectures pertaining to generational diversity and the enthusiasm of the lecturers. More specifically, students enjoyed the lectures which were more interactive or that had small-group activities or individual assignments. Areas for improvement suggested by students included the fact that some of the lecturers “were not experts in the field” but one student also mentioned understanding that this is an “under-studied field.” Two students also expressed an interest in learning more about models of teaching utilized at other medical schools.

Medical Education II Enrichment Elective

The Medical Education II Enrichment Elective was first offered in the 2016-2017 academic year and therefore only one year of data is currently available. Thirteen general survey questions were included in the survey (n=7) and twelve lecture-specific questions

(response rates vary based on attendance). As compared to the Medical Education I surveys, the Medical Education II survey used the general survey questions to assess student comfort level with specific education-related topics being covered in the course. The lecture-specific question then aimed to elucidate whether students felt that the lecture topics were useful and included the lecturer name within each questions stem. This was done with a goal of differentiating student comfort and characteristics from the overall utility and success of the specific lecture and lecturer. Survey results revealed the organization of the Medical Education II course was superior to the organization of the Medical Education I courses (mean = 4.57, st. dev. = 0.49). Also, students overall agreed with the statements that they would recommend the course to future students and that the lectures helped them learn (mean = 4.86, st. dev. = 0.35). The “Competency-Based Medical Education” lecture was the most highly-rated (mean = 4.60, st. dev. = 0.49, n = 5), while the “Assessment and Evaluation of Teaching and Learning” lecture received the lowest score (mean = 3.83, st. dev. = 0.37, n = 6). The remainder of the results are summarized in Tables 4 and 5. Student qualitative responses for the Medical Education II elective highlighted the strength of the workshops and expressed a desire to focus more on careers that incorporate medical education. The sessions that focused on developing research projects in medical education were also praised in the qualitative feedback as strengths of the curriculum.

Scholarly Activity and Summer Research

In the first year the Scholarly Activity was available for enrollment, eleven students registered to complete a Scholarly Activity in Medical Education. All projects are currently in the development or implementation phase. One project involves the development and evaluation of a simulation model for vascular anastomoses. This project will be tested on students and residents over a twelve-month period, after which the outcomes will be compiled and analyzed. Two students are developing a joint project to define mentor skills and characteristics that are valuable from the mentees’ perspectives. The ultimate goal of this project is to utilize the results to guide faculty development initiatives on campus. Summer research projects currently in development cover a wide range of topics pertaining to medical

education including radiology education, question bank development, and team-based learning research.

Medical Education III

In the pilot Medical Education III elective offered in the 2016-2017 academic year, three students participated and completed the course. One teaching session was implemented and focused on teaching students pediatric fluid replacement therapy. Two additional teaching sessions are currently in development. One teaching session focuses on evaluation, diagnosis, and management of stroke and is designed as a team-based learning activity. The second session has a lecture-based format and focuses on appropriate laboratory utilization in the hospital setting, incorporating test utility and cost awareness.

Distinction

The current graduating class of 2017 is the first class eligible to apply for a Distinction in Medical Education. Three students are currently in the process of completing the distinction requirements. The design, implementation, and evaluation of the Medical Education track and distinction described in this thesis comprise the work of two students collaborating jointly since the initial conception of the track. The third student has completed an extensive analysis focusing on identifying predictors of performance on the USMLE Step 1 exam.

Table 1. Survey data for the Medical Education I Enrichment Elective conducted in the 2014-2015 academic year, including percentage of student responses (SA=5 and SD=1), mean response, and standard deviation.

Medical Education I Enrichment Elective (2014-2015)							
n = 17	SA	A	N	D	SD	Mean	STDEV
The course met the learning objectives stated in the syllabus.	52.9%	41.2%	5.9%	0.0%	0.0%	4.47	0.61
The course was well organized.	47.1%	47.1%	0.0%	5.9%	0.0%	4.35	0.76
The lectures helped me learn.	64.7%	35.3%	0.0%	0.0%	0.0%	4.65	0.48
The relevance of the course to physicians and medical students was apparent.	64.7%	35.3%	0.0%	0.0%	0.0%	4.65	0.48
The length of each session was ideal.	58.8%	41.2%	0.0%	0.0%	0.0%	4.59	0.49
The length of each session fit well into my schedule.	58.8%	35.3%	5.9%	0.0%	0.0%	4.53	0.61
The group size was appropriate for the format of this elective.	64.7%	35.3%	0.0%	0.0%	0.0%	4.65	0.48
I would recommend this elective to future students.	70.6%	23.5%	0.0%	5.9%	0.0%	4.59	0.77
I feel I have gained a better understanding of issues related to Medical Education.	70.6%	28.4%	0.0%	0.0%	0.0%	4.71	0.45

Table 2. Survey data for the Medical Education I Enrichment Elective conducted in the 2015-2016 academic year, including percentage of student responses (SA=5 and SD=1), mean response, and standard deviation.

Medical Education I Enrichment Elective (2015-2016)							
n = 18	SA	A	N	D	SD	Mean	STDEV
The course met the learning objectives stated in the syllabus.	33.3%	55.6%	11.1%	0.0%	0.0%	4.22	0.63
The course was well organized.	27.8%	66.7%	5.6%	0.0%	0.0%	4.22	0.53
The lectures helped me learn.	27.8%	55.6%	16.7%	0.0%	0.0%	4.11	0.66
The relevance of the course to physicians and medical students was apparent.	33.3%	61.1%	5.6%	0.0%	0.0%	4.28	0.56
The length of each session was ideal.	38.9%	55.6%	5.6%	0.0%	0.0%	4.33	0.58
The length of each session fit well into my schedule.	27.8%	66.7%	0.0%	0.0%	5.6%	4.11	0.88
The group size was appropriate for the format of this elective.	27.8%	61.1%	11.1%	0.0%	0.0%	4.17	0.60
I would recommend this elective to future students.	38.9%	33.3%	22.2%	5.6%	0.0%	4.06	0.91
I feel I have gained a better understanding of issues related to Medical Education.	33.3%	44.4%	22.2%	0.0%	0.0%	4.11	0.74
I understand the different roles physicians can have in medical education in the academic medical setting.	33.3%	50.0%	11.1%	5.6%	0.0%	4.11	0.81
I understand the pathway to becoming a clinical educator.	11.1%	77.8%	11.1%	0.0%	0.0%	4.00	0.47
I understand how to develop an effective learning objective.	27.8%	66.7%	0.0%	5.6%	0.0%	4.17	0.69
I understand the difference between a learning objective, a learning goal and a learning mission.	27.8%	66.7%	0.0%	5.6%	0.0%	4.17	0.69
I understand the utility and limitations of various teaching methodologies (i.e. behaviorism, cognitivism, etc.) in constructing a learning objective.	16.7%	55.6%	16.7%	11.1%	0.0%	3.78	0.85
I am familiar with a variety of learning theories in the classroom.	27.8%	50.0%	16.7%	0.0%	5.6%	3.94	0.97
I understand how to alter teaching modalities to meet the learning styles of my audience.	27.8%	61.1%	5.6%	0.0%	5.6%	4.06	0.91
I understand the benefits and limitations of small group learning.	16.7%	77.8%	5.6%	0.0%	0.0%	4.11	0.46
I understand the process in designing an effective small group session.	27.8%	55.6%	11.1%	5.6%	0.0%	4.06	0.78
I understand the differences between effective and ineffective communication when speaking to an audience.	33.3%	55.6%	5.6%	0.0%	5.6%	4.11	0.94
I understand how to tailor my message to meet my audience's baseline knowledge.	27.8%	66.7%	5.6%	0.0%	0.0%	4.11	0.55

Table 3. Survey data for the Medical Education I Enrichment Elective conducted in the 2015-2016 academic year, including percentage of student responses (SA=5 and SD=1), mean response, and standard deviation.

Medical Education I Enrichment Elective (2015-2016) n = 17							
	SA	A	N	D	SD	Mean	STDEV
I understand how to actively gauge audience understanding, and adjust accordingly.	17.6%	76.5%	5.9%	0.0%	0.0%	4.12	0.47
I know what an educational needs assessment is.	17.6%	70.6%	5.9%	5.9%	0.0%	4.00	0.69
I understand the utility for an educational needs assessment.	35.3%	58.8%	5.9%	0.0%	0.0%	4.29	0.57
I understand the factors/process necessary to create an effective educational needs assessment.	17.6%	70.6%	11.8%	0.0%	0.0%	4.06	0.54
I understand how to encourage feedback, both positive and negative.	29.4%	58.8%	5.9%	0.0%	5.9%	4.06	0.94
I understand how to utilize feedback in a forward constructive manner.	41.2%	47.1%	5.9%	0.0%	5.9%	4.18	0.99
I am comfortable with giving positive and negative feedback to peers, seniors, and juniors.	29.4%	58.8%	5.9%	5.9%	0.0%	4.12	0.76
I am comfortable with receiving positive and negative feedback from peers, seniors, and juniors.	23.5%	64.7%	5.9%	5.9%	0.0%	4.06	0.73
I understand the differences in characteristics of the generations currently in healthcare.	35.3%	52.9%	11.8%	0.0%	0.0%	4.24	0.64
I am familiar with strategies to bridge the generational gap amongst healthcare professionals.	23.5%	64.7%	11.8%	0.0%	0.0%	4.12	0.58
I am familiar with the key features of a successful presentation or teaching session.	17.6%	70.6%	11.8%	0.0%	0.0%	4.06	0.54
I know how to make material understandable but also memorable in a presentation setting.	23.5%	58.8%	17.6%	0.0%	0.0%	4.06	0.64
I am comfortable with presenting to large groups.	11.8%	58.8%	23.5%	0.0%	5.9%	3.71	0.89
I have an understanding of the various methods to evaluating teaching effectiveness in the context of medical education.	17.6%	64.7%	11.8%	5.9%	0.0%	3.94	0.73
I am familiar with using evidence and feedback to adjust my teaching effectiveness.	17.6%	64.7%	11.8%	5.9%	0.0%	3.94	0.73

Table 4. Survey data for the Medical Education II Enrichment Elective conducted in the 2016-2017 academic year, including percentage of student responses (SA=5 and SD=1), mean response, and standard deviation..

Medical Education II Enrichment Elective (2016-2017) n = 7							
	SA	A	N	D	SD	Mean	STDEV
The course met the learning objectives stated in the syllabus.	28.6%	71.4%	0.0%	0.0%	0.0%	4.29	0.45
The course was well organized.	57.1%	42.9%	0.0%	0.0%	0.0%	4.57	0.49
The lectures helped me learn.	85.7%	14.3%	0.0%	0.0%	0.0%	4.86	0.35
The relevance of the course to physicians and medical students was apparent.	71.4%	28.6%	0.0%	0.0%	0.0%	4.71	0.45
The length of each session was ideal.	28.6%	71.4%	0.0%	0.0%	0.0%	4.29	0.45
The length of each session fit well into my schedule.	42.9%	42.9%	14.3%	0.0%	0.0%	4.29	0.70
The group size was appropriate for the format of this elective.	71.4%	28.6%	0.0%	0.0%	0.0%	4.71	0.45
I would recommend this elective to future students.	85.7%	14.3%	0.0%	0.0%	0.0%	4.86	0.35
I feel I have gained a better understanding of issues related to Medical Education.	57.1%	42.9%	0.0%	0.0%	0.0%	4.57	0.49
If I am pursuing a Scholarly Activity in Medical Education, I feel that this elective has been helpful in preparation	57.1%	28.6%	14.3%	0.0%	0.0%	4.43	0.73
Participating in this elective has encouraged me to pursue a career as a medical educator.	57.1%	42.9%	0.0%	0.0%	0.0%	4.57	0.49
I plan to do my Scholarly Activity in Medical Education.	71.4%	14.3%	0.0%	14.3%	0.0%	4.43	1.05
I plan to pursue a Distinction in Medical Education.	28.6%	14.3%	28.6%	28.6%	0.0%	3.43	1.18

Table 5. Survey data on lecture-specific questions for the Medical Education II Enrichment Elective conducted in the 2016-2017 academic year, including percentage of student responses (SA=5 and SD=1), mean response, standard deviation, and number of student responses per question.

*Lecturer names redacted for privacy

Medical Education II Enrichment Elective (2016-2017) *								
n = varies	SA	A	N	D	SD	Mean	STDEV	n
Research Methods in Medical Education	40.0%	40.0%	20.0%	0.0%	0.0%	4.20	0.75	5
Identifying a Mentor and Maximizing the Mentor-Mentee Relationship	57.1%	14.3%	28.6%	0.0%	0.0%	4.29	0.88	7
Quality Improvement in Medical Education	42.9%	42.9%	14.3%	0.0%	0.0%	4.29	0.70	7
Generating a Hypothesis in Medical Education	28.6%	57.1%	14.3%	0.0%	0.0%	4.14	0.64	7
Medical Education Research Presentations	50.0%	16.7%	33.3%	0.0%	0.0%	4.17	0.90	6
Curriculum Design	0.0%	100.0%	0.0%	0.0%	0.0%	4.00	0.00	5
Scholarly Activity Proposal - Workshop I	28.6%	42.9%	28.6%	0.0%	0.0%	4.00	0.76	7
IRB for Medical Education	40.0%	20.0%	40.0%	0.0%	0.0%	4.00	0.89	5
Medical Education Research Presentations	33.3%	66.7%	0.0%	0.0%	0.0%	4.33	0.47	6
Assessment and Evaluation of Teaching and Learning	0.0%	83.3%	16.7%	0.0%	0.0%	3.83	0.37	6
Effective Survey Design	16.7%	83.3%	0.0%	0.0%	0.0%	4.17	0.37	6
Competency-Based Medical Education	60.0%	40.0%	0.0%	0.0%	0.0%	4.60	0.49	5

CHAPTER 4 – DISCUSSION AND FUTURE DIRECTIONS

There is an emerging body of literature that aims to describe, develop, and investigate the utility of implementing Medical Student as Teachers programs across the country and across the world. As highlighted previously, a vast majority of medical schools rely on their medical students to teach peers and near-peers, whether it is part of the formal curriculum or in a tutoring/remediation setting.¹ However, at most institutions formal training in education skills and techniques is limited. As highlighted by Smith et al., with the increasing research and clinical productivity demands of academic medical centers, time available for faculty development in teaching has slowly diminished. Additionally, residents have a growing number of responsibilities caring for more and more critically ill patients in the setting of pressures to shorten hospital stays and work-hour restrictions. These restraints make it difficult for many residency programs to establish strong, longitudinal Resident as Teacher programs that truly develop residents into skillful clinician educators. Thus, although medical school is certainly a rigorous four-year period at the beginning of a physician's career in medicine, it may truly be the best time for developing the skills necessary to be an effective life-long educator.⁶ Additionally, given the fact that it is estimated that first-year residents spend approximately 25% of their time teaching and up to 62% of student learning in the clerkships is attributed to resident teaching, it is reasonable to conclude that when newly minted physicians begin their residency, they should have a basic teaching skillset.¹⁶⁻¹⁸ Programs like the one described here have the potential to fill the current gap that exists in developing physicians as competent educators. This will not only serve to benefit future generations of physicians, but also colleagues and, most importantly, patients and their families, since the ability to effectively communicate with and educate patients is a critical part of the doctor-patient relationship.

The newly developed curriculum for the Medical Education Track and Distinction at UT Southwestern aims to provide students with a longitudinal exposure to medical education with a focus on developing basic skills and knowledge necessary to becoming an effective educator and conducting research in medical education, while also providing opportunities to acquire direct teaching experience. This is done through three medical education courses, a

scholarly activity in medical education, and an opportunity for students to earn a Distinction in Medical Education upon graduation. The program developed and described here is certainly not the first of its kind but does have unique aspects that set it apart from previously established programs. Overall, most medical student as teacher curricula are short-term experiences. Additionally, most programs are targeted to fourth-year (or their equivalent, internationally) medical students teaching near-peers in earlier years of medical school. Furthermore, programs generally focus on teaching skills and providing direct teaching experiences. The newly developed curriculum at UT Southwestern is unique in that its design was led by medical students with a significant interest in medical education. The student-led design allowed for the establishment of a curriculum that students found pertinent to their development as effective clinician educators. Secondly, the curriculum provides for a longitudinal medical education experience beginning in the students' first year of medical school and extending through their final semester, should they decide to pursue the Distinction. Finally, the curriculum focuses on a combination of a foundation of knowledge key for future clinician educators, skill development, teaching experience, and research in medical education.

Overall, the establishment of this new track and distinction has been overwhelmingly successful. The initial step in the creation of this pathway was the establishment of the Medical Education I Enrichment Elective. The student interest was significant and, as one student states, "I definitely enjoyed this elective more than some of the other longer running ones I've participated in." With significant positive feedback after the first elective, support was gained from faculty and administrators facilitating the expansion to a full track and distinction. Over the first two years the Medical Education I course was offered, greater than thirty-five students have participated. The first year the Medical Education II elective was offered, more than 10 students participated. At the time of submission, there were eleven students (approximately 4.6% of the class) enrolled in the medical education Scholarly Activity. In addition to the significant student interest, faculty interest in involvement and development of the track has been inspiring. To date, at least twenty different faculty members have volunteered their time to give lectures for the courses, facilitate workshops,

and/or serve as mentors for students interested in completing a medical education project for their scholarly activity.

With regards to the Medical Education I Enrichment Elective, across the two years it has been offered, students have consistently evaluated it with positive marks. The general survey questions aimed to evaluate whether students felt the course met learning objectives, was well organized, helped them learn, and gave them a better understanding of issues related to medical education, among other things. For each of the general questions, the average response ranged from a 4.06 to a 4.71, indicating that most students either agreed or strongly agreed with the statements. Student qualitative feedback has, likewise, been very positive with students consistently commenting on the enthusiasm of the instructors and the value of the workshops. The most commonly suggested area for improvement has been the Adult Learning Theory and Psychology of Learning lecture. In the assessment of students' confidence with the stated learning objectives of the lecture, the average response ranged from 3.78 to 4.06. The lecture aims to cover a very large topic in a short time period and furthermore, the content is not familiar for most medical students. Presentation of this content could be improved by breaking down the material into more than one session and making the sessions more interactive. The overall lowest scoring learning objective that was analyzed during the second year of the elective was students' feeling comfortable with presenting in large groups (average response 3.71). It is difficult to determine however, whether this is a reflection of adequacy with which the material was covered or rather of the personality of those filling out the survey and the hesitation most people have when speaking to large groups.

For Medical Education II, students again evaluated the course with highly positive marks. As with the Medical Education I elective, there were a series of general questions for the elective at the beginning of the student evaluation survey, followed by a series of lecture-specific questions. For the general questions assessing the elective as a whole, the average responses were all greater than 4 with a range from 4.29 to 4.86. With regards to specific lectures, those that had the lowest averages included those on the Scholarly Activity Proposal (4.0), IRB for Medical Education (4.0), Curriculum Design (4.0), and Assessment and Evaluation of Teaching and Learning (3.83). Student comments from the first year of this

elective were limited, thus making it difficult to make targeted improvements to these lectures. Moving forward, it would be beneficial to expand the student survey to analyze specific learning objectives for each lecture, as is now done for the Medical Education I elective.

Two of the most interesting student comments received from student feedback across both electives were 1) a few students expressed difficulty in seeing the utility of some of the material being presented, commenting that, “we [won’t] be able to use [it] for several more years” and “we won’t be able to exercise teaching skills until we obtain a position in academic medicine” and 2) that some of the faculty presenters “were not experts in the field.” In alignment with the first concern brought up in student feedback, a study done at Columbia looking at student awareness of teaching as a key aspect of their jobs as future physicians, they found that primary student motivators for teaching included enjoying teaching and a desire to review material. Interestingly, none of the students wanted to gain teaching experience because of the importance of being an effective educator in their future career as a physician.¹⁶ These comments in the elective feedback and the study done by Amorosa and colleagues highlights the importance of emphasizing to students that regardless of their future career goals, teaching is a critical part of being a physician. Moving forward, it will be useful to search for way to implement a “teaching how to teach” curriculum for all medical students. We believe the second concern mentioned by several students highlights a broader knowledge gap in the field of medical education itself. One student even states, “I know medical education is an under-studied field.” Only recently has interest in medical education research started to grow at an exponential rate and we hope that through implementation of this curriculum and others like it at academic medical centers across the world, the number of academicians invested in medical education research will continue to grow.

One of the key limitations of the Medical Education Track and Distinction is the step-wise nature by which it was developed. Rather than developing the entire curriculum prior to its implementation, the medical education courses were developed one at a time. Thus, in the course content described above, there is clear overlap; however, as each new course was developed, the prior courses were edited to minimize redundancies and improve the concept of advancing topics from Medical Education I through Medical Education III. The most up-

to-date elective syllabi used for the 2016-2017 academic year are included in Appendix 1 through 3. Now that the curriculum is fully implemented and established, there is a significant opportunity to re-visit each stage and seek areas for improvement in an effort to make the track as cohesive as possible. Additionally, it will be helpful to refer to resources such as the review article published by Sutkin et al. to ensure that the curriculum provides the skills and information necessary for becoming an effective medical educator.¹⁵

Another limitation of this curriculum important to consider moving forward is the method by which it is evaluated. Currently, as discussed, the courses are evaluated by student surveys using the Likert scale. As Marton and colleagues highlight in their review of teaching skills development programs for medical students, the subjective nature of the data “[does] not necessarily correlate with objective changes” and “this lack of objectivity limits the strength of the conclusions” that can be drawn.³ Moving forward, it will be important to evaluate outcomes based on more objective data, such as evaluation by experienced faculty educators or, in the future, through evaluation in light of a set of specifically developed teaching competencies. Additionally, it would be useful to seek long-term follow up data from participants’ residency programs. This would also allow a control group to be obtained if residency programs were able to provide data on teaching skills for those who participated in the Medical Education Track compared to other residents in the program.

A third limitation of the curriculum as it exists now, is the limited availability of direct teaching experiences for all track participants. As explained previously, there are summer teaching experiences available for students to pursue between their PCII and PCIII semesters; however, the opportunities are highly competitive and not currently restricted to students participating in the medical education track. The Medical Education III course during the Post-Clerkship period was designed to provide students with more direct teaching experience. Unfortunately, however, during the course’s first year, obtaining these opportunities proved difficult for students. As the course continues to evolve, a key area of focus should be establishing consistently available teaching opportunities. An excellent program to look to for guidance in this is the program developed by Ten Cate O. in the Netherlands. At the University Medical Center in Utrecht, after completing a one-week course in medical education required for all students, interested students have the opportunity to participate in a

six-week elective teaching rotation where they have weekly meetings with a course director and participate as a teacher in a course they have already completed.⁹ Another potential avenue for expanding teaching opportunities available for program participants is through student-run free clinics. This method for teaching medical students how to teach was explored by Hamso et al. at Columbia University's student run clinic. In this study they found that many students had their first teaching experience in the student run clinic. Additionally, they noted that students felt challenged to teach their peers while balancing patient care in a manner that is similar to the demands of residency.¹⁰ UT Southwestern already has a number of established student-run clinics and a Post-Clerkship elective entitled "Service Learning at Dallas Student-Run Free Clinics," where students can serve as mentors to pre-clerkship students in the clinic for a month. The course already requires the development and implementation of a project in the clinic, which could easily be oriented toward education.

In looking to the future of the Medical Education Track and Distinction there are a few additions we hope to make. First is the establishment of a Journal Club during the Post-clerkship period for those students taking Medical Education III. As Sophie Cook, an assistant editor for the British Medical Journal argues, "the aims of...journal clubs are three-fold: to teach and develop critical appraisal skills, to increase exposure to rapidly evolving medical literature, and to inform clinical practice".²⁶ It can be deduced that these same aims can be sought for a medical education journal club where students begin to develop an ability to critically appraise medical education literature, become familiar with current research in medical education, and use what they have discussed to inform their teaching practices, in essence developing the use of "evidence-based teaching."

Additionally, we aim to implement OSTEs into the track in the future. As discussed above, the track is currently limited by a lack of objective data. As outlined by Trowbridge and colleagues in their systematic review of the OSTE, the tool "is a reliable means of evaluating teaching skills, especially when one of the well-studied rating instruments is utilized."¹⁴ Although the utility of the OSTE with regards to improving teaching skills has not been clearly established, it would provide a tool for more objective analysis of track participants' teaching skills. Ideally, an initial OSTE would be given as a part of the Medical Education I course in the PCII semester and a follow up OSTE would be given at the end of

the Medical Education III course, to provide post-intervention data. These aspirations are clearly dependent on the feasibility of implementing the OSTE in terms of cost and resources.

Finally, as highlighted throughout this manuscript, it is pertinent for all future physicians to have a basic teaching skillset. Regardless of whether or not they are interested in a future career as a clinician educator, all physicians are responsible for teaching medical students and peers during residency as well as patients and their families throughout their careers. We intend to pursue the implementation of a Medical Students as Teachers curriculum as a component of the required coursework for all graduating medical students.

There is an opportunity for initial exposure to the importance of developing not only as a future clinician but also as an educator in the PCI Human Structures Course. As discussed previously, students participating in the Medical Education I elective struggled to recognize the importance of gaining teaching skills early in their journey to becoming a physician, a sentiment that was echoed in the study done at Columbia University.¹⁰ Given that the Human Structures course begins during the first week of medical school and the course structure with alternating “A” and “B” teams performing the dissections, it provides an ideal platform for introducing students to their roles as future educators. A new lecture could be developed that discusses basic concepts critical to teaching their peers which can then be implemented when team “A” teaches the key components of their dissection to team “B” and vice versa. This model was described by Bentley and Hill in their paper discussing peer-teaching in the medical gross anatomy laboratory. In their study, they found that a majority of students had a positive experience with peer teaching. They also reported however, that students expressed concerns and drawbacks of the method, especially related to concern that their peers were providing inadequate instruction.¹¹ These drawbacks could potentially be mitigated with instruction on teaching and how to provide a dissection “sign-out” to peers.

An additional opportunity lies in the Post-Clerkship Transitions in Clinical Training Course, which is required for all students and serves to help students prepare for the transition from medical student to intern. We believe this would be an optimal place to incorporate a teaching curriculum as supported by the University of California – San Francisco Course “Teaching to Teach.” For this course, students are introduced to key concepts and skills in

medical education. Follow up data of course participants in residency revealed that most residents agreed or strongly agreed that the course better prepared them to teach during residency.⁴ At UT Southwestern, a teaching curriculum guide could be developed for each Transitions in Clinical Training Course (e.g. one course is offered for Pediatrics, one for Medicine, one for Surgery, etc.) which could then be implemented in a field-specific manner by each of the course directors. Ideally, at the end of the course students would take an OSTE to gauge their skill level and provide an additional learning opportunity. Interestingly, this OSTE could also provide a control group to compare to Medical Education Track participants. With all students participating in a Transitions to Clinical Training OSTE, the evaluations of students who participated in the track could be compared to those who did not in order to establish whether or not a significant difference exists in OSTE scores.

In summary, the newly developed Medical Education Track and Distinction at UT Southwestern, provides a unique opportunity for medical students interested in education to have a longitudinal experience that develops their knowledge and skills needed to become a future educator and researcher. It is our vision that medical schools across the country will develop both required curricula on teaching for all medical students as well as more in-depth elective experiences for those students who desire to pursue a career in academic medicine as clinician educators. Ultimately, achievement of this vision will lead to more well-rounded physicians who not only excel in teaching students and peers but also patients, their families, and the communities in which they serve.

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Table 5: Medical Education II Enrichment Elective (2016-2017) Lecture-specific Data

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APPENDIX 1 – SPRING 2017 MEDICAL EDUCATION I COURSE SYLLABUS

A. Course Directors: Dr. Angela Mihalic and Dr. James Wagner

B. Student Liaisons: Joo Lee and Clementine Young

C. Requirements:

- a. Minimum participants for course to be conducted: 10
- b. Maximum number of students for the course: 40

D. Rationale:

- a. Throughout their careers, physicians serve as teachers to both trainees and patients on a daily basis. Developing the ability to be an effective educator is critical, but exposure to training in the field is limited. Through this elective, students will learn the crucial skills needed to become informed, effective, and memorable instructors. These skills will be applicable not only in the classroom, but also at the patient bedside.
- b. This course will explore medical education from various aspects including, but not limited to:
 - i. Clinical educator tracks and opportunities
 - ii. Learning theory and various learning modalities
 - iii. Educational needs assessments and evaluating teaching effectiveness
 - iv. The components of an organized, effective, and memorable presentation
 - v. Testing modalities and their effectiveness in evaluating students' knowledge
 - vi. Strategies for adapting presentations to a diverse audience
 - vii. Research opportunities in medical education at UT Southwestern, and pathways to academic medicine.
- c. With the knowledge and skills acquired through this elective, students will be able to confidently convey their knowledge to a wide variety of audiences in the hospital, community, and academic settings.

E. Objectives:

Through participation in this course students will be able to:

- a. Develop an understanding of the wide variety of teaching opportunities in the field of medicine
- b. Become familiar with the diverse populations physicians interact and teach on a daily basis
- c. Develop critical skills in analyzing their audience and utilizing this information to compose an effective presentation
- d. Explore learning theory as it pertains to medical education
- e. Become familiar with assessing educational needs and evaluating teaching effectiveness
- f. Participate in interactive workshops that further enhance their ability to engage an audience
- g. Develop the ability to effectively evaluate the understanding of patients and trainees following an educational activity

F. Format:

- a. The course will be taught through nine one-hour interactive lectures and two instructor-led workshops

G. Course Evaluation:

- a. Grading will be pass/fail. To receive transcript acknowledgement, students must:
 - i. Attend a minimum of eight lectures
 1. Students can make up one missed lecture by attending a Grand Rounds presentation that is part of the “Effective Teacher Series”
 - ii. Attend a minimum of one out of the two workshops
 - iii. Complete the online evaluation form

H. Schedule:

- a. Lecture 1: Introduction to Academic Medicine and Medical Education
 - i. Time: 1 Hour

ii. Objectives:

1. Introduce students to different ways physicians can become involved in medical education in the academic medical setting (curriculum reform, basic science/pre-clinical education, clerkship directors, resident/fellow training)
2. Introduce the basics of curriculum design
3. Discuss general pathways to becoming a clinical educator
4. Discuss additional degrees and/or certifications that can potentially be sought

b. Lecture 2: How to Effectively Communicate With, and Teach, a Specific Audience

i. Time: 1 Hour

ii. Objectives:

1. Discuss how to teach to the knowledge level of your audience
2. Provide students with examples of effective versus ineffective communication tools
3. Develop an understanding of how to generate a talk that facilitates the audience's ability to gain an understanding of a complex or detailed topic, or to "see the forest for the trees"

c. Lecture 3: Generational Diversity in the Medical Field: How it Influences our Learning Environment and How it Should Influence our Teaching Style

i. Time: 1 Hour

ii. Objectives:

1. Describe and contrast the general characteristics of the generations currently in healthcare
2. Discuss the impact of these characteristics on teaching, learning, and expectations in the work environment
3. Describe the foundation for the characteristics noted in the millennial generation and potential impact on teaching and learning methodologies as well as professionalism

4. Discuss potential strategies to bridge the generational gap and develop the characteristics and behaviors required to be a healthcare professional
- d. Lecture 4: Writing Effective Learning Objectives
 - i. Time: 1 Hour
 - ii. Objectives:
 1. Introduce students to the purpose and importance of learning objectives
 2. Discuss the differences between learning objectives and learning goals and how to compose them
 3. Provide students with examples of effective learning objectives
 4. Practice developing learning objectives that demonstrate higher levels of thinking and communicate clearly
- e. Lecture 5: Completing an Educational Needs Assessment
 - i. Time: 1 Hour
 - ii. Objectives:
 1. Define an educational needs assessment and discuss its importance
 2. Examine the steps of completing an educational needs assessment
 3. Discuss the use of needs assessments in designing educational activities
 4. Provide examples of methods of assessment
- f. Workshop 1: Facilitating Small Group Activities
 - i. Time: 2 Hours
 - ii. Objectives:
 1. Describe the strengths and benefits of small group learning in medical education
 2. Discuss the importance of the group environment, the role of the facilitator, and active participation

3. Provide an example of an effective small group session
 4. Practice designing a small group learning session
- g. Lecture 6: Effective Feedback
- i. Time: 1 Hour
 - ii. Objectives:
 1. Constructing feedback, asking appropriate questions, and giving feedback at the right time
 2. Augmenting presentations to incorporate feedback
 3. How to elicit feedback and emphasize the importance of it
 4. Cover both sides of the feedback argument
- h. Lecture 7: Assessing Learning (Multiple Choice Questions and More)
- i. Time: 1 Hour
 - ii. Objectives:
 1. Discuss the pros and cons of different assessment modalities: oral vs. multiple choice vs. practical, etc.
 2. Examine various testing strategies in multiple choice questions
 3. Practice writing test questions and answer choices to fairly evaluate student knowledge
- i. Workshop 2: Creating an Effective Large Group Presentation
- i. Time: 2 Hours
 - ii. Objectives:
 1. Describe the key features of a successful presentation or teaching session
 2. Emphasize the importance of organization and clarity
 3. Discuss how to make material understandable but also memorable
 4. Have students bring background information on a topic of their choice and generate a short presentation (possibly within small groups) with one or two learning objectives and five to ten supporting slides

- j. Lecture 8: The Psychology of Learning, Adult Learning Theory, and Introduction to Different Learning Modalities
 - i. Time: 1 Hour
 - ii. Objectives:
 - 1. Provide a general introduction to learning theory
 - 2. Define different modalities used in medical education, the research behind these methods, and correlation with test/step scores
 - 3. Discuss individual leaning styles and how each modality relates to each learning style
- k. Lecture 9: Pathways to Academic Medicine and Medical Education Research at UT Southwestern
 - i. Time: 1 Hour
 - ii. Objectives:
 - 1. Understand the pathways leading to a career in medical education and the importance of scholarly activity
 - 2. Understand the variety of jobs and roles in medical education
 - 3. Understand the opportunities available for students to participate in medical education research at UT Southwestern

APPENDIX 2: FALL 2016 MEDICAL EDUCATION II COURSE SYLLABUS

A. Course Directors: Dr. Dorothy Sendelbach, Dr. James Wagner, Dr. Angela Mihalic

B. Student Liaisons: Madeline Jiang and Alice Jean

C. Requirements:

- a. Minimum participants for course to be conducted: 10
- b. Maximum participants for the course: 40

D. Rationale:

- a. Throughout their careers, physicians serve as teachers to both trainees and to patients on a daily basis. Developing the ability to be an effective educator is critical, but exposure to training in this field is limited. Building on the Medical Education I Enrichment Elective, where students learned crucial skills needed to become informed, effective, and memorable instructors, this elective will introduce students to the knowledge and skills required for participation in scholarly activity in the field of medical education.
- b. This course will explore medical education from various aspects including, but not limited to:
 - i. Exploring types of medical education projects
 - ii. Designing and implementing a successful medical education project and measures of success
 - iii. Preparing students for a scholarly activity in medical education
 - iv. Assessing educational needs and evaluating teaching effectiveness
 - v. Testing modalities and their effectiveness in gauging student knowledge

E. Objectives:

Through participation in this course, students will:

- a. Develop an understanding of research methods used in medical education
- b. Understand how to optimally develop curriculum in medical education
- c. Become familiar with assessing educational needs and evaluating teaching effectiveness

- d. Participate in interactive workshops that further enhance their ability to design and implement a medical education project
- e. Develop the skills to effectively measure the understanding of patients and trainees following an educational activity
- f. Develop a medical education scholarly activity project proposal or research focus under the guidance and supervision of the students' scholarly activity faculty mentors, for students planning on pursuing the M.D. with Distinction in Medical Education

F. Format:

- a. The course will be taught through eight approximately one-hour interactive lectures and four workshops. Students will meet with the Track Director and their mentors at least once if they are interested in pursuing a medical education scholarly activity.

G. Course Evaluation:

- a. Grades will be pass/fail. To receive transcript acknowledgement, students must:
 - i. Attend a minimum of ten total elective hours
 - 1. Students are allowed to make-up one missed lecture by attending a Grand Rounds presentation that is part of the "Effective Teacher Series"
 - ii. Attend at least one workshop
 - iii. Complete the online course evaluation form

H. Schedule:

- a. Lecture 1: Research Methods in Medical Education
 - i. Time: 1 Hour
 - ii. Objectives:
 - 1. Define the purpose for medical education research
 - 2. Identify the processes and tools involved in medical education research

3. Provide examples of current projects in the field of medical education research
- b. Workshop 1: Medical Education Research Presentations
 - i. Time: 2 Hours
 - ii. Objectives:
 1. Present a medical education research project for two minutes
 2. Develop presentation skills based on feedback
 3. Learn different techniques to present medical education research
- c. Lecture 2: Identifying a Mentor and Maximizing the Mentor-Mentee Relationship
 - i. Time: 1 Hour
 - ii. Objectives:
 1. Understand the role of the mentor and what to expect from a mentor
 2. Know the qualities of an effective mentor
 3. Provide direction and advice for selecting, approaching, and communicating with potential mentors
- d. Lecture 3: Generating a Hypothesis in Medical Education
 - i. Time: 1 Hour
 - ii. Objectives:
 1. Define the components of a hypothesis in medical education
 2. Provide examples of hypotheses and explore the importance of a clear hypothesis on a research project.
 3. Generate hypotheses concerning medical education interests based on a given problem
- e. Lecture 4: Quality Improvement in Medical Education
 - i. Time: 1 Hour

- ii. Objectives:
 - 1. Define quality improvement (QI) and what distinguishes it from research
 - 2. Understand QI concepts and the function of QI tools that are relevant to scholarly activity in medical education
 - 3. Generate hypotheses concerning medical education interests based on a given problem
- f. Workshop 2: Scholarly Activity Proposal I
 - i. Time: 2 Hours
 - ii. Objectives:
 - 1. Learn the expectation for a scholarly activity proposal
 - 2. Develop a proposal for a hypothetical project in small groups
 - 3. Critique the proposals developed
- g. Lecture 5: Curriculum Design
 - i. Time: 1 Hour
 - ii. Objectives:
 - 1. Define the purpose of curriculum design
 - 2. Discuss the process of curriculum design and how to incorporate student involvement
 - 3. Identify necessary resources for developing a successful curriculum
- h. Lecture 6: Competency-Based Medical Education
 - i. Time: 1 Hour
 - ii. Objectives:
 - 1. Define competency and the purpose of competency-based medical education
 - 2. Discuss the history of competency-based medical education and the literature that supports its use
 - 3. Compare competency-based medical education to other medical education approaches

4. Discuss the advantages and disadvantages of competency-based medical education
 5. Understand and propose methods to evaluate competency for either a provided example or a scholarly project
- i. Lecture 7: Effective Survey Design
 - i. Time: 1 Hour
 - ii. Objectives:
 1. Understand the purpose of surveys and appropriate indications for their use
 2. Discuss the components of an effective survey compared to an ineffective survey
 3. Understand how to appropriately choose question types based on the information the educator is trying to solicit
 4. Practice designing an effective survey in the context of medical education
 - j. Workshop 3: IRB Proposal for Medical Education
 - i. Time: 2 Hours
 - ii. Objectives:
 1. Understand how to submit and access resources for an IRB proposal online
 2. Discuss the components of a comprehensive IRB research application
 3. Understand the types of projects that require IRB approval
 4. Provide students with an understanding of the timeline required for IRB approval
 5. Understand when changes to study designs need to be submitted for re-approval
 - k. Workshop 4: Scholarly Activity Proposal II
 - i. Time: 2 Hours

ii. Objectives:

1. Develop a scholarly activity proposal for a project
2. Draft outlines for project background, hypothesis, design, and potential conclusions based on the scholarly activity proposal template
3. Develop a tentative timeline for proposal completion

1. Lecture 8: Assessment and Evaluation of Teaching and Learning

i. Time: 1 Hour

ii. Objectives:

1. Describe various assessment modalities and how they are used currently in medical education (including, but not limited to, traditional multiple choice questions, TBL IRAT and GRAT testing, long answer format questions, verbal assessment)
2. Gain the ability to evaluate the effectiveness of assessments
3. Understand the importance of tracking assessment performance
4. Discuss ways assessment performance should be used to guide future teaching approaches

APPENDIX 3: FALL 2016 MEDICAL EDUCATION III COURSE SYLLABUS

- A. Department: Internal Medicine
- B. Faculty Coordinator: Dr. Blake Barker, Associate Dean for Student Affairs, Assistant Professor of Internal Medicine
- C. Adjunct Supervisors/Faculty:
 - a. Dr. Dorothy Sendelbach, Assistant Dean of Undergraduate Medical Education, Professor of Pediatrics
 - b. Dr. Angela Mihalic, Associate Dean for Student Affairs, Professor of Pediatrics
 - c. Dr. James Wagner, Associate Dean for Student Affairs, Professor of Internal Medicine
- D. Classification: MS4 Elective
- E. Hospital/Location: UT Southwestern Medical School
- F. Periods Offered: 4, with longitudinal experiences available throughout the academic year
- G. Length:
 - a. Full-year: Students are expected to participate as a Colleges Peer Mentor for the entire fourth year if they sign up for this elective. Students will mentor pre-clerkship students in the Medical Education II elective as they develop their scholarly activity project proposals
 - b. Elective Block: During period four of their fourth year, students will attend lectures for the elective. They will also develop and lead an educational activity (e.g. TBL). Additionally, students will be required to complete and Educator's Portfolio that will be submitted to the course director prior to the end of the clerkship
- H. Maximum Number of Students: 6
- I. Prerequisites: Completion of the clerkship curriculum and completion of the Medical Education I and II electives. Approval must be obtained from the faculty coordinator prior to registration for the course.

J. First Day Contact: Dr. Blake Barker

K. First Day Time and Place: TBD

L. Additional Information: Students may not take another elective during period 4.

M. Description:

- a. Throughout their careers, physicians serve as teachers to a wide variety of audiences, including but not limited to, medical students, trainees, colleagues, patients, and members of the community. Developing the ability to be an effective teacher is crucial, but exposure to training in this field is limited. Through this fourth-year elective, students will continue to expand upon the skills they have learned in Medical Education I and II to become informed, effective, and memorable instructors. Students will learn through small group lectures and discussions as well as hands-on experience. Skills learned in this elective will be applicable not only in the classroom, but also at the patient bedside, and in the community. This elective is a requirement of the medical education distinction track, in addition to the other requirements. Students who are not pursuing the distinction may take this elective but cannot obtain the distinction without meeting the other requirements.

N. Course Goals and Objectives:

- a. Medical Knowledge

Students will attend lectures that cover the following topics:

- i. Review of Clinician Educator Tracks in Academic Medicine
- ii. Educational Administration
- iii. The Role of Simulation in Medical Education
- iv. Inter-professional Education
- v. Incorporating Technology in your Teaching
- vi. Micro-skills of Teaching – The One Minute Preceptor
- vii. Creating an Educator's Portfolio
- viii. Team Based Learning

Depending on lecturer's preference, students may have assigned reading to complete prior to each lecture

b. Practice Based Learning

i. Team Based Learning (TBL) Session Development and/or

Development of an Interactive Learning Curriculum

1. Students will complete assigned reading and attend a lecture on TBLs
2. Students will work with a faculty mentor to develop a testable Team Based Learning Session, including session content, as well as IRAT, GRAT, and application questions
3. Students will receive evaluations from the students who participate in the TBL as well as the faculty mentor
4. Alternatively, students may propose to create an interactive learning session for a larger audience that does not follow the traditional TBL format, if approved by the course director

ii. Medical Education II Mentor and Colleges Mentor

1. Students will serve as a mentor for colleagues earlier in the track who are in the process of developing their scholarly activity proposals through providing editing and feedback
 - a. Students will be responsible for mentoring between two and four students
2. Students will serve as a Peer Mentor for the Academic Colleges Program throughout their fourth year and will be evaluated by their Colleges mentor
 - a. Through the Colleges, students will also engage in bedside teaching and receive feedback from the pre-clerkship students, which will be reviewed with the course director

iii. Optional Extracurricular Involvement

1. Compose practice questions to be made available for students to review pre-clerkship material
2. Plan and/or facilitate Step-Up to Step 1 Sessions

3. Create and/or edit online training modules for the medical education track
 4. Review pre-clerkship syllabus content, structure, and format
- c. Interpersonal Communication Skills
- i. Students will develop critical communication skills related to teaching in a wide variety of settings including large groups, small groups, TBLs, bedside teaching, and patient education
 - ii. These skills include, but are not limited to:
 1. Engaging tone of voice
 2. Good audience eye contact
 3. Appropriate tempo/pace
 - iii. Students will learn to assess whether their communication skills result in effective information exchange
- d. Professionalism
- i. Students will collaborate during group sessions to explore issues of professionalism, including:
 1. Addressing student complaints
 2. Soliciting feedback and correcting criticisms
 3. Analyzing evaluations
 4. Mitigating classroom disagreements
 5. Moderating panel discussions
 - ii. Students will explore HIPPA and other ethical challenges as they pertain to preparing and delivering lectures
- e. Systems-Based Practice
- i. Students will understand appropriate resource utilization when preparing, presenting, and distributing educational materials
 - ii. Students will discuss effective methods for soliciting and utilizing multidisciplinary input in order to deliver comprehensive instruction
 - iii. Students will become aware of being an educator within the larger context of graduate medical education

- iv. Students will incorporate considerations of cost-awareness and risk-benefit analysis as it pertains to patient or population based care into their medical curriculum

f. Project

- i. Students will assemble a template-driven Teaching Portfolio that summarizes their work and experience gained through the elective in addition to any additional related experiences obtained throughout medical school (and before, if applicable)
- ii. Portfolio should include:
 - 1. Summary of work done throughout medical school related to medical education
 - 2. Faculty and peer evaluations from TBL session or interactive learning session, lecture/TBL preparatory materials (slides, background research, etc), and de-identified outcome data (e.g. IRAT/GRAT scores)
 - 3. Peer evaluations from mentees in the Medical Education II elective
 - 4. Mentor and pre-clerkship student evaluations from the Colleges program
 - 5. Evaluations from any other education/tutoring experiences in medical school
 - 6. A reflective essay where the student discusses their teaching philosophy, their progress to date, and future goals related to academic medicine and medical education

O. Methods of Instruction

- a. Bi-weekly lectures with assigned readings
- b. Experiential learning as outlined above

P. Schedule

- a. Lectures: Dates and times TBD, based on lecturer availability

- b. TBL session planning implementation to be discussed with Course Director and Faculty Mentor

Q. Methods of Evaluation

- a. Pass/Fail, no written exam
- b. Students will be evaluated based on attendance, project completion, faculty evaluations, peer evaluations, and completion of course evaluation

AUTHOR VITAE

Ashley Nicole Yoder Lapse was born in Evansville, Indiana on April 17th, 1991. Growing up she was active in both sports (basketball, softball, volleyball) and dance. She graduated from high school in Topeka, Kansas, which is where she met her husband, Jason Lapse. After high school she went on to earn her bachelor's degree in Microbiology with a minor in Psychology from the University of Iowa. As an undergraduate at Iowa, she discovered her passion for education. This passion led her to seek out her colleague and now good friend, Neda Wick, and together they developed the Medical Education Track and Distinction at UT Southwestern. In her free time, Ashley continues to enjoy playing and watching sports (especially the Iowa Hawkeyes). Following her graduation from medical school, she will be relocating to Kansas City to begin her Child Neurology training at Children's Mercy Hospital.

Neda E. Mitkova Wick (September 26th, 1989 - present) was born and raised in Sofia, Bulgaria. She moved California with her parents and older brother, Ivan, when she was ten years old. While attending the University of California, Davis to complete her undergraduate degree, Neda met her husband, William Wick. After William completed his military service, they relocated to Texas. They have a puppy, named Charlie. Neda and William enjoy living in Dallas and have many hobbies including manufacturing leather products, restoring old vehicles, and building furniture. Following her graduation, Neda will begin her residency training in Pathology at UT Southwestern. She plans to pursue a career in the field of Neuropathology with a focus in Medical Informatics and hopes to continue teaching throughout her career.