

In-Depth Learning: One School's Initiatives to Foster Integration of Ethics, Values, and the Human Dimensions of Medicine

Steven L. Kanter, MD, Paul F. Wimmers, PhD, and Arthur S. Levine, MD

Abstract

Today's medical student curriculum is a lock-step experience that provides a broad survey of medicine with little opportunity to pursue fully integrated, in-depth learning. To teach students about the human dimensions of health care, many schools simply have added courses that survey general areas such as ethics, values, and patient–doctor relationships. However, a superficial, broad-brush approach does not offer students sufficient opportunity to engage with these topics in substantive and meaningful ways.

The authors propose that a theme-based, individualized, in-depth learning experience (in which students pursue a

focused project comprehensively and in detail)—one that is an integral part of the curriculum—helps students learn to blend values and ethics with medicine in a way that cannot occur during rapid-paced topical survey courses. Furthermore, it is in the depths of a learning experience that one comes face to face with the realities of uncertainty: the realization that unanswerable questions outnumber answerable ones; the awareness of the difficulty in accumulating sufficient evidence to answer a question that is, in fact, answerable; the recognition that many patients' problems transcend available evidence and must be addressed by the art of medicine; the realization that a

patient can have a condition that one cannot diagnose and that may even get better for reasons that one cannot understand.

The authors describe three initiatives at the University of Pittsburgh School of Medicine, two of which have been offered for more than 10 years, that illustrate the value of in-depth learning experiences. These in-depth experiences blend situated learning, reflective exercises, faculty mentoring, critical reading of literature, and constructive feedback in a prescribed but individualized curriculum.

Acad Med. 2007; 82:405–409.

Editor's Note: A commentary on this article appears on page 321.

There is a general consensus among medical educators that it is important for medical students to receive formal teaching in ethics, values, and the human dimensions of health care.¹ As a result, many schools have added courses that canvass areas such as ethical theory, patient autonomy, informed consent, malpractice, and professionalism. Sometimes these courses are linked in various ways to other survey courses, thus giving the impression of integration. However, a superficial, broad-brush approach does not offer students

sufficient opportunity to engage with these topics in a way that is substantive and meaningful and that enhances the learning of biomedical science and clinical practice. Short, modular courses that provide little time for reflection, emphasize memorization for multiple-choice examinations, and give students the opportunity only to scratch the surface of ethical dilemmas using clinical vignettes do not provide the foundation students need in today's world.

The situation is even more challenging now than in the past because modern medicine involves complex clinical decision making, often because of scientific advances that press the limits of the current state of thinking in bioethics. A compelling example is the relatively new field of neuroethics, which focuses on important ethical and value-laden questions raised by rapid progress across the continuum of investigation in brain function, from molecular neurobiology to cognitive neuroscience. These questions focus on issues such as the moral and ethical consequences of the enhancement of normal brain function, the use of psychopharmaceuticals for socially objectionable behavior not

associated with a clinical disorder, and the consequences of measuring neurophysiological phenomena that may have psychological meaning (so-called brain reading).² The complexity and scope of these questions reveal that it is more important than ever before for educational programs in medicine to enhance a rigorous foundation in biomedical science with deep learning about ethics, values, and the human dimensions of health care.

Basic survey courses in medical ethics, communication, and the patient–doctor relationship are important and necessary but are not sufficient to achieve deep learning of ethics and values. Entwistle and Entwistle³ and others (e.g., see Evans et al⁴) have described the importance of deep approaches to learning compared with surface approaches. Deep approaches to learning are characterized by an intent to understand, vigorous interaction with content, critical appraisal of content, correlation of new and old knowledge, use of organizing themes, and justification of conclusions on the basis of the evidence.^{5,6} To achieve these learning goals, programs in medical education should provide students

Dr. Kanter is vice dean, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Dr. Wimmers is instructor, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Dr. Levine is senior vice chancellor for health sciences and dean of medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Correspondence should be addressed to Dr. Kanter, University of Pittsburgh School of Medicine, M240 Scaife Hall, 3550 Terrace Street, Pittsburgh, PA 15261; telephone: (412) 648-9000; fax: (412) 648-9065; e-mail: (kanter@pitt.edu).

in-depth learning experiences that bring them into direct contact with current ethical dilemmas and matters of uncertainty and with issues that encumber the integrity and consistency of current personal and professional value systems.

Below, we describe three such curricular initiatives, implemented at the University of Pittsburgh School of Medicine, that provide opportunities for our students, throughout the four years of the medical curriculum, to pursue theme-based, in-depth learning experiences. The initiatives are (1) the Area of Concentration (AOC) program, (2) the Integrated Life Sciences (ILS) courses, and (3) the Scholarly Project (SP). Whereas the AOC is elective, the ILS and the SP are integral parts of the required curriculum, designed to run alongside traditional biomedical science courses and clinical clerkships. These experiences enable students to pursue a focused project, topic, or idea comprehensively and in detail. They combine situated learning, reflective exercises, one-on-one faculty mentoring, critical reading of the literature, and constructive feedback in a prescribed but individualized curriculum. Students have opportunities to learn how to blend ethics and values with medicine and science in a way that cannot occur during a rapid-paced topical survey course or clerkship.

The Three Initiatives

Area of Concentration Program

The AOC program was first implemented in the mid-1990s and has been offered continuously since then. An AOC is an innovative educational experience that enables students to pursue an area of special interest in depth during their four years in medical school. It is a longitudinal experience based on an underlying theme that supplements the required core curriculum. For example, students who elect an AOC in disabilities medicine might engage in the following experiences: During the first and second years of medical school, the students attend specially designed evening meetings in which faculty, who regularly work with patients with disabilities, lead sessions (often hands on with real patients) about eliciting a medical history from an individual with a mental disability, performing a physical examination on an individual in a

wheelchair, or critically appraising relevant literature. These activities catalyze a deeper learning experience than occurs in the standard curriculum and help students confront both personal and societal values. For example, one interaction among faculty and students revolved around the proposition that an individual with a spinal injury who enrolled in a health professions school (such as nursing, medicine, or dentistry) would be limited in terms of performing certain procedures and pursuing certain specialties. Some participants posited that, especially given recent rapid advances in technology, it was both naïve and arrogant to predict, and certainly to limit, future options for a disabled student. The in-depth exploration of this topic led each participant to a more complete understanding of his or her own preconceived notions and of his or her definition of a nurse or doctor or dentist, and made it possible for each participant to define and discuss, in a deep way, unanswered questions about the role of individuals with disabilities in various professions.

AOC students will gain firsthand insight into services and programs for individuals with disabilities by visiting at least two community agencies. During the third year of medical school, the student may not engage in activities designed specifically for the AOC, but the student has a foundation on which to build a clinical framework for understanding the concept of disability. During the fourth year of medical school, the student will engage in an ongoing research project or in an interesting practice in the field of disabilities under faculty supervision. Throughout the four years, the student maintains a portfolio that includes a personal statement of philosophy, research reports, annotated bibliographies, selected personal journal entries, evaluations, and other evidence of educational experience. The portfolio is assessed by a team of knowledgeable faculty. At the end of the experience, the student is required to produce a “deliverable” (e.g., a report, an oral presentation, or a film).

A faculty member may submit a proposal for a new AOC to the medical school’s curriculum committee for approval. Thus far, proposals have been submitted by teams consisting of both faculty members and students, sometimes with the idea

being initiated by students who then recruit interested faculty members. The committee considers each proposal largely on the basis of the quality of the following seven core elements:

- a rationale for why the AOC should be implemented and how it enhances the required curriculum;
- explicit goals and objectives;
- the didactic content;
- the experiential component;
- one-on-one faculty mentoring;
- a hypothesis-driven project (including a formal written critique by one or more experts and presentation in a local or national forum); and
- a plan to evaluate student achievement, faculty teaching and mentoring, and the quality of the AOC.

Each student who completes successfully the requirements of an AOC receives a certificate, is commended in a dean’s letter recommending that student for residency training, and is recognized formally at a function near the time of graduation from medical school.

Each year, there is an introductory overview of the AOC program in the fall, coordinated by the office of student affairs along with the AOC directors. Subsequently, the director of each AOC conducts informational meetings. Requirements for faculty and student participants are specified in detail and communicated to them before the start of the AOC. The director of each AOC determines how many students can be accommodated in that AOC. For most of the AOCs, there is ample opportunity and encouragement for students with an interest in that area to participate in activities, even if they are not completing a certificate. Summer work may be required, and a fourth-year elective is often expected. Periodic meetings of each student with his or her mentor(s) and with the AOC director(s) are essential for a successful program and must be documented. Evaluation of students includes, but is not limited to, mentor reports, documentation of attendance, an ongoing journal or portfolio maintained by the student, and an expert critique of the hypothesis-driven project. Feedback is communicated to each student formally via one-on-one meetings with a faculty mentor at least twice yearly.

A letter from AOC faculty leaders describing the nature and quality of each student's achievement is sent to the dean of students by the beginning of that student's senior year of medical school for potential use in the dean's letter.

The AOC concept has captured the imagination of several faculty members and many students and is reflected in the creativity and originality of the AOC experiences initiated by them. Since the inception of this project in 1997, seven innovative longitudinal experiences were designed by joint faculty/student groups and approved by the curriculum committee. The titles of the seven experiences are Disabilities Medicine, Service Learning, Women's Health, Geriatrics, Biomedical Informatics, Medical Humanities, and Global Health. There has been significant interest in the AOCs, growing from participation of five students in the initial year to, on average, approximately 15% of each class (approximately 22 students, assuming around 148 students per class) participating each year since that time. The school's curriculum committee monitors the overall progress and functioning of all AOCs and strives to achieve maximum cross-fertilization among the AOCs, including credit for journal clubs, coordination of service sites, and publication of activities.

Integrated Life Sciences Courses

ILS courses were offered for the first time in academic year 1995–1996 and have been presented each year since then. An ILS course is a required, innovative, advanced experience in biomedical science that enables each senior medical student to reexamine important basic science concepts, to integrate knowledge of basic science with clinical medicine, to enrich his or her understanding of the scientific method, and to develop skills for critical appraisal of biomedical literature. Each course is directed by one or two faculty members who recruit other teaching faculty as needed, assign students to appropriate laboratories and clinics, and evaluate students. The faculty workload is comparable with that of designing and implementing a high-quality fourth-year elective course. The course is designed to fit within the sequence of standard rotations during the fourth year of medical school. Students develop an in-depth understanding of the limitations and uncertainty inherent in

both the art and science of medicine by going from bench to bedside within a single four-week experience. For example, a student enrolled in the neoplasia ILS may participate in the initial discussions of developing a new, experimental chemotherapeutic protocol one morning and, later that same day, grapple with the constraints and ambiguities of selecting a protocol for a patient. Placing these experiences in close proximity provides opportunities for integrated discussion and reflection about uncertainty, ethics, and values.

ILS courses were first designed and implemented in the early 1990s by faculty and students at the University of Pittsburgh School of Medicine as a series of four-week courses specifically aimed at achieving the aforementioned goals. Each senior student must choose at least one ILS course. ILS courses foster learning through clinical experiences, lectures, PBL sessions, journal clubs, therapeutic protocol construction and analysis, observation and/or performance of selected laboratory procedures (e.g., Western blot), simulated grant-writing exercises, and critical appraisal of pertinent literature. Initially, ILS courses were developed in neoplasia, clinical pharmacology, surgical life sciences, and infections in reproductive disease. Subsequently, ILS courses in molecular medicine and neuroscience were approved by the school's curriculum committee. The director of each ILS course determines how many students can be accommodated in that area.

The ILS course is a feasible, well-received educational model for providing advanced experiences in biomedical science for fourth-year medical students. The senior student's stage of intellectual and professional development motivates him or her to return to the basic sciences to gain a more meaningful understanding of disease. It is not uncommon to hear fourth-year students state that they wish they had listened more carefully during the first-year basic science courses. This is an indication that fourth-year students are at a point in their medical education where they are able to see the relevance of basic science to clinical medicine in a way that had eluded them previously. Thus, when it comes to basic science, the fourth year of medical school is a teachable moment, and the ILS courses

are designed to capitalize on that phenomenon.

Scholarly Project

After a multiyear planning process in the early 2000s, the SP program was implemented in academic year 2004–2005. A full description of the SP has been reported elsewhere, along with a comparison with scholarly initiatives at other medical schools.⁷ An SP activity is a required longitudinal mentored experience in which the student engages in a hypothesis-driven research project during medical school. Research is defined broadly, with an emphasis on the level of rigor and the quality of scholarship. Each student pursues in depth a focused question with close guidance from a faculty mentor. Although the concept of the SP is similar to that of the AOC, the SP is more intensely focused on the process of inquiry, including the development of an answerable question, gathering evidence to support or refute a hypothesis, interpreting data, and deriving conclusions justified by the data. The SP experience also includes a thorough examination of the ethical issues inherent in research, especially issues concerning the use of human subjects. An SP activity can fulfill part of the requirements of an AOC.

The SP is based on the philosophy that students who become independent, creative thinkers will be better physicians and scientists, and that participation in the process of discovery is an excellent way to become such a thinker. Additionally, we believe that if students play active roles in the process of discovery, a greater number of them will be more likely to pursue careers as physician–scientists and, more generally, in academic medicine. To achieve these philosophical goals, and to shape the thinking of every student, an SP activity must be an integrated part of the curriculum, not a stand-alone requirement for graduation.

Students prepare for conducting a project by completing (during the first half of the first year of medical school) a course called Medical Decision Making, in which students learn the basics of epidemiology, biostatistics, EBM, and related topics. Subsequently, they complete (during the second half of the first year and the first half of the second

year of medical school) a course called Methods and Logic in Medicine, in which students learn in small groups how to formulate a focused question, interpret data, and critically appraise relevant literature. This course also covers topics such as human-subject issues, research ethics, and the appropriate and humane use of animals in research. However, it is in the process of conducting one's project that a student develops a deep appreciation for the application of ethical principles to everything from the truthfulness of a single data point to the complexity of the multiple, diverse issues involved with each human subject.

Successes and Challenges

An indication of the success of AOCs has been the range and quality of student projects. Examples include "Study of Barriers to Contraception in Adolescent Women," "Sentinel Lymph Node Mapping for Breast Cancer: Is Preoperative Imaging Necessary?" "Curriculum Review of Years 1 and 2 for Women's Health Content," "Development of a Health Intake and Risk Assessment Tool for Female Inmates," "Wheelchair Overuse," "HIV Education to Individuals with Deafness," "Incontinence in the Elderly Individual with a Disability," and "Anxiety in Children with Autism." The project on wheelchair overuse won an award at a national meeting.

Feedback from both faculty and students has been very positive. One student commented that an "AOC really focuses your attention on a specific area, even while rotating on other clerkships," and another student said that an "AOC is like having a minor in college." Preliminary results from a survey of students who participated in an AOC reveal that the AOC experience added to the standard medical curriculum by providing "insight into career choice" and by connecting "people with similar interests." Several students noted that an important advantage of an AOC was the opportunity to develop a more substantial mentoring relationship with a faculty member. Only one student noted that an AOC had a negative impact on the student's medical education by creating unrealistic expectations with regard to time commitments. Problems with the implementation of the AOC program as a whole include

distinguishing between what is and what is not an AOC, and defining the level of rigor expected for student projects. Overall, it seems that AOCs have been a valuable complement to the standard medical curriculum, providing an opportunity for medical students to participate in a high-quality, rigorous learning experience that adds a continuous thematic dimension to the four years of medical school.

Successes reported by students for ILS courses include a better understanding of bench-to-bedside medicine; an improved understanding of the limitations of biomedical science and of how these limitations translate to uncertainties that challenge the diagnostic and therapeutic process; a more thorough understanding of the applications of ethics, especially when new and/or experimental treatments are involved; and an improved ability to appraise biomedical literature. Challenges include linking clinical and basic science material in a meaningful way, given the constraints of a four-week course.

These in-depth learning experiences improve the learning environment by enabling full integration of learning about ethics and values. They also catalyze the development of several processes that are important to learning, including, but not limited to, critical thinking, one-on-one mentoring, generating and refining focused questions about a given problem, self-directed learning, lifelong learning skills, methods of inquiry, interpretation of data, and developing an understanding of what it means to be an expert. Other positive effects of in-depth learning experiences include the development of an ongoing awareness of the potential for scholarship as part of service activities, particularly service to underserved and special populations, and an awareness that these experiences provide opportunities for those interested in academic medicine to develop credentials.

In the SP initiative, by pursuing a focused question in depth, the student confronts issues of ambiguity and uncertainty as he or she attempts to interpret and synthesize data that may form part of an answer to that question. The student encounters the limits of current knowledge in biomedical science and

begins to understand how that limits what one can accomplish in clinical medicine. And the student must deal with ethical issues, from the truthfulness of a single data point to the autonomy of a human being.

Problems and issues of concern that have occurred with all three curricular initiatives described above include providing students adequate information early enough so that they can make informed decisions; the sentiment in one class that the SP was of primary value only to those who were interested in research as a career focus; the desire to use the AOC mechanism to recruit students to a particular specialty by creating a specialty-specific AOC (the curriculum committee has not approved such proposals); variations in rigor and overall quality of student AOC projects; and matching, in a consistent manner, specific activities in other programs (e.g., a dual-degree program) that will fulfill specific requirements of the SP (this is important because the SP is a curricular requirement).

Discussion and Summary

More has been learned about biomedical science in the last 10 years than in all of history theretofore. We human beings realize enormous benefits from these developments, but this rapid pace of discovery also makes us vulnerable. These scientific advances often raise critically important issues that strain the limits of our current understanding of ethics, and some new discoveries raise questions that challenge the consistency of current value systems. Thus, it is especially important to incorporate learning about ethics and values in the formative stages of a professional education. Blending these issues with science from the very beginning of medical school reinforces the reality that they are inextricably intertwined. Ethics, individual and societal values, and skills to address uncertainty in meaningful ways become an integral part of both the substance and style of one's approach to learning and to the practice of medicine. On a practical level, the fact that many schools have added experiences in which students see real patients early in the curriculum underscores the importance for students to understand the human dimensions of health care from the beginning of medical school.

One challenge is that the depth of experiences in professional school curricula is limited by the necessity of breadth. It is precisely this limitation that makes it difficult to fully integrate learning about the human dimensions of medicine. Values, ethics, communication, and the complexities of the patient–doctor relationship are best appreciated and understood in a coherent context, which requires an in-depth learning experience in addition to a topical overview course. It is in the depths of a learning experience that one encounters the nuances and subtleties that comprise what we call the art of medicine. It is in the depths of a learning experience that one comes face to face with the realities of uncertainty: the realization that unanswerable questions outnumber answerable ones; the awareness of the difficulty in accumulating sufficient evidence to answer a question that is, in fact, answerable; the recognition that many patients' problems transcend available evidence and must be addressed by the art of medicine; and the realization that a patient can have a condition that one cannot diagnose and that may even get better for reasons that one cannot understand. And it is in the very deepest part of a learning experience that one has an opportunity to understand a patient's subjective experience and explore one's own emotional responses.

AOC, ILS courses, and the SP are opportunities for medical students to participate in high-quality, rigorous, in-depth learning experiences that add a continuous thematic dimension to the four years of the curriculum (with the option to spend an extra year in medical school). These experiences accomplish their goals by blending experiential learning, reflective exercises, faculty mentoring, critical reading of the literature, and constructive feedback in a prescribed but individualized curriculum. Although the experiences differ—AOCs complement the standard curriculum, whereas students must select one of six ILSs, and the SP is an integrated

component of the curriculum—all three programs help students explore a potential career focus, and bring students and faculty together for in-depth, thorough study of a broad-based theme. All three programs provide experiences for students to explore values, ethics, and the uncertainty inherent in science and medicine, in a way that is not possible during traditional, fast-paced survey courses.

The three educational models that we describe help teach ethics and values by immersing students in the real-world context of medicine and biomedical science. It is in this context that students can observe firsthand and participate directly in decisions that involve ethical dilemmas (e.g., determining the right time to stop a clinical trial), in decisions that depend on a value system (e.g., choosing options for end-of-life care), and in decisions that must be made under conditions of uncertainty (e.g., the determination of cancer-screening guidelines).

Current educational theory supports the notion that the quality of learning is a function of the context in which learning occurs. For example, the theory of situated learning posits that learning involves progressively increasing engagement in a community of practitioners,⁸ and social learning theory⁹ highlights the importance of observation and modeling in the learning process. Thus, our educational models go beyond what is possible in classroom-based lectures by incorporating observation, modeling, and participation in a community of experts.

Successful implementation of in-depth experiences require a culture within the medical school that values education, as well as a highly committed and involved faculty who are willing to spend the necessary time with medical students. A centrally governing curriculum committee with the capability and flexibility to approve new initiatives on an efficient timeline is essential.

Oversight mechanisms are important to evaluate the learning experience, to ensure quality, and to foster cross-pollination among these educational experiences. It is also important to evaluate the long-term impact of these experiences. Because of resource and time constraints, we have invested our efforts to date in building the programs and ensuring their quality.

In summary, although topical survey courses contribute to student knowledge in important ways, in-depth learning experiences provide a real-world context in which contemporaneous and interconnected experiences present opportunities for students to engage and interact firsthand with values, ethics, uncertainty, and the complexities of the patient–doctor relationship.

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