On the Value of Architecture and Facility Management in Health Administration Education

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ABSTRACT

This article discusses the role and function of architecture and facility management in health administration education vis-à-vis an interdisciplinary set of courses taught in a graduate-level health administration program. These courses provide the future health care executive with theory and applied knowledge on a variety of topics. These include the history of health care facilities, issues in facility planning and management, principles of patient and staff-focused design, campus master planning, participatory methods to involve end users in the design of their work, and care settings. Additional skills acquired include an introduction to contract negotiations, the reading of technical documents such as blueprints, the post-occupancy assessment of facilities-in-use, and familiarity with future trends. Students address the topic of managerial ethics in relation to the built environment in some detail as a vehicle to illustrate the nature of key fine-grain issues of importance to the health administration scholar and professional. The discussion concludes with the presentation of a model curriculum in this subject area.

INTRODUCTION

Architecture and the health professions are intimately interwoven and have been so for more than 2,000 years. Change has been the normative

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condition, from the Askepieion of ancient Greece, to the Roman bath houses, the monastic hospitals of the middle ages, the palace hospitals of the Renaissance, the Nightingale ward hospitals of the 19th and 20th centuries, to the high-technology, minimalist hospitals of the postwar decades (Thompson and Goldin 1975). In the current period of reconfiguration of the health care architectural landscape, change remains the dominant force. Throughout the history of the 20th century, health care architecture, the health care administrator, and the architect have worked in tandem to respond to an increasingly accelerated pace of change. This required keeping abreast of advancements in medicine, administrative and organizational paradigms, architectural design, and building technology (Verderber and Fine 2000).

In the post-1945 era, issues confronting hospital boards, administrators, and their architects have ranged from Hill-Burton federal funding for health care facilities nationwide, to U.S. Department of Housing and Urban Development renewal initiatives during the 1950s and '60s, and the emergence and rapid expansion of Medicaid and Medicare. Each of these programs had a profound impact on what was built. More recently, in the era of cost containment and managed care, priorities have focused on the pursuit of architectural alternatives to costly inpatient care, on issues of hospital scale, site planning, and the use of recycled, environmentally conscious building materials.

In 2000, $17.6 billion was spent on the construction and renovation of health care facilities in the United States alone. Expenditures in this key sector of the construction industry soared during the 1990s, and by 2000 alone, the number of projects reported in a key industry survey, the annual *Modern Healthcare Construction and Design Survey*, totaled 3,854 (Croswell 2001). The health care construction sector is one constantly in flux. This growth in expenditures shows no signs of abating.[1]

While the level of health care construction activity in the United States is substantial each year, this volume of activity pales in comparison to global spending on health care facilities. Care providers, working with architects, will affect the quality of health care delivery on a global scale in the coming decades. The world's 6.1 billion population increases by nearly 9,000 people each hour. Several worldwide population institutes estimate that by 2050, between 9 and 9.5 billion people will be living. The population of the United States by 2050 will have surpassed 400 million (Worldwatch Institute 2001). With this said, knowledge of the past and present functions of architecture in relation to health facility planning, design, assessment, and management can be of great

benefit to the health administrator. It follows that the people who possess skills in the adroit application of key facility planning and evaluation principles will likely have a competitive advantage in their daily work. Often, as a means to "get one's feet wet," the recent graduate is thrust into the midst of an ongoing capital improvement project to learn the players and various constituencies within an institution. Such sink-or-swim scenarios are seen as a rite of passage, a test of competency. It is of no small coincidence that the term "architecture" is frequently used analogously in the field of organizational behavior as applied to health care management contexts (Nadler et al. 1992).

Health administration programs in the United States usually do not include curriculum in health care facility planning, assessment, and management. But a few business schools do offer coursework in construction management and the capital development process. These courses tend to not focus on health care, however. Meanwhile, the knowledge required to guide a health-related renovation or new building project successfully is becoming ever more complex. It requires interaction with more specialists and sub-specialists than ever before (Hemmes 1993; Haggard and Hosking 1999). As of August 2001, 36 colleges and universities in the United States had both a National Architectural Accreditation Board (NAAB)-accredited professional program in architecture and an Association of University Programs in Health Administration (AUPHA)-member professional program in health administration within the same post-baccalaureate institution. Thirty of these AUPHA member programs led to graduate degrees, and six led to undergraduate degrees. Three of these 36 programs offered both undergraduate and graduate degrees in the field.

But only one of these 36 AUPHA-member programs offered one or more courses specifically on health care architecture, assessment, facility planning, and management. Tulane University has offered these courses continuously since 1985 to students in the Master's in Health Administration (MHA), Master's in Public Health (MPH), Doctor of Public Health (Dr. Ph.), and MD/MPH degree programs. Since 1992, Tulane has required a course in this subject for students in the Executive MHA degree program, and since 1998, for students enrolled in the Master of Medical Management (MMM) degree program that is taught largely in Taiwan. These courses are taught to students in the Department of Health Systems Management (HSM). This department is one of five within Tulane's School of Public Health and Tropical Medicine (SPHTM). Tulane offers the only faculty appointment of its type between

an architecture school and a program in health administration.[2] The non-executive variants of the three courses described below are open to architecture students as well. In the majority of cases, the enrollment mix has been half health administration and half architecture majors. By contrast, all of executive format MHA and MMM students are required to complete the executive format variant of *Facility Planning and Evaluation.*

Health Administration and Architecture: A Synthesis

This portion of the discussion describes three interdisciplinary courses taught to students in the SPHTM and the School of Architecture at Tulane. These are *Architecture and Human Health, Facility Planning and Evaluation,* and *Aging, Health, and the Built Environment.* Each is a three-credit course. These courses are hereafter referred to as Course 1, Course 2, and Course 3. They have been recognized with a prestigious award from the American Institute of Architects—the AIA National Education Honor Award (Pavlos 1996; Verderber and Refuerzo 1999).[3]

The courses cover theoretical as well as key technical skills of importance in the field of health care facility management. Students learn through discussions, site visits to health care facilities, lectures, guest lectures, and interdisciplinary team projects. Case studies of completed buildings-in-use are discussed on a regular basis (Verderber and Refuerzo 1993; Refuerzo and Verderber 1993). The interaction of health administration students with architectural students and others, such as medical students and epidemiologists, has been rewarding for all. It allows the architect to learn about the mindset of future clients, and vice versa. The fostering of common ground is of high priority. The confrontation of myths and the shedding of biases are key goals. Among such myths are, "Architects don't care about the bottom line," or by contrast, "Administrators only care about the bottom line." Student learning objectives are as follows:

COURSE 1 (*ARCHITECTURE AND HUMAN HEALTH*):

1. Knowledge of the major periods in the history of health care environments, from the earliest Neolithic settlements to the present period and beyond. This consists of knowledge of the six eras or "waves" of health care architectural history as articulated by Verderber and Fine (2000): The Ancient, The Medieval, The Renaissance, The Nightingale, the Minimalist Megahospital, and The Virtual Healthscape.

2. Knowledge of key principles drawn from the fields of environment and behavior, architecture, and allied design fields such as landscape and interior design. Knowledge of the importance of maximizing the fit of society, culture, nature, the individual, and the organization.
3. Knowledge of methods to create and improve the therapeutic amenity of the physical setting.
4. Knowledge of successful and unsuccessful health facility case studies and recurrent pitfalls to avoid.
5. Knowledge of current and future trends in the field.

COURSE 2 (*FACILITY PLANNING AND EVALUATION*):

1. Production of a functional space program document for a health care construction project.
2. Knowledge of construction budgets, construction documents (ability to read blueprints), scheduling, cost analyses, and contract negotiations.
3. Knowledge of the twelve major steps in the processes of health care facility planning, design, and construction.
4. Knowledge of the language of the architect, ethical dilemmas, shedding of myths, and disciplinary biases.
5. Ability to conduct an independent, post-occupancy evaluation of a health care facility-in-use.
6. Familiarity with case studies of buildings-in-use from a health management perspective.
7. Knowledge of current and future trends in the field.

COURSE 3 (*AGING, HEALTH, AND THE BUILT ENVIRONMENT*):

1. Knowledge of major international developments in the history of architecture for the aged.
2. Knowledge of key concepts in the interdisciplinary field of environment and aging.
3. Experience in conducting a team-based, post-occupancy evaluation of a long-term care facility.
4. Knowledge of successful administrative practices to maximize the therapeutic and palliative amenity of long-term care environments for the aged.
5. Knowledge of current and future trends in the field of facility planning and design with respect to long-term care environments for the aged.

A topic covered in the *Facility Planning and Evaluation* course, managerial ethics, is discussed below as a vehicle to provide a detailed look into one particular facet of the material taught. Each course employs in-class reports and team projects. Topics have ranged from the history of the medicinal spa as a precursor to the contemporary wellness center, the post-occupancy evaluation of an inpatient psychiatric unit, the function of architectural imagery in "e-marketing" campaigns by health care providers on the Internet, to the relationship between the digital divide and health care architecture. Occasionally, student projects involve an actual client as the recipient of the end product. An example is a capital improvement feasibility study for the renovation of a not-for-profit retirement center. These activities expose the student to technologies including videography of buildings-in-use, data analysis and spreadsheet software applications, use of the Internet, and direct observation, interview, and survey research techniques. Health administration students work in teams with other students.

The following example is but one of many teaching units of likely value to the health administration student.

Managerial Ethics and the Health Care Built Environment

In recent years, the issue of ethics has emerged as a flashpoint curricular component in both the fields of architecture and health care administration. In architecture, ethical concerns have centered on professional practice (Blau 1984; Gutman, 1988), the need for the architect to function in a reflective, self-questioning manner (Schon 1983), on the use of the case study as a means to examine various scenarios in professional practice (Wasserman et al. 2000), and in general as a vehicle for critical dialogue and debate (Fox 2000).

In health administration education, parallel ethical issues are being addressed through a variety of methods. Peters and Waterman (1982) have addressed ethics in relation to the attainment of success, and Verespej (1990) and Stewart (1996) have addressed ethics in relation to group dynamics in management. With the recent spate of federal investigations into health care industry providers and practices, this topic is particularly timely. Gac, Boerstler, and Ruhnka (1998) note that the legal profession has long recognized the Socratic method as an effective device for promoting critical thinking and analysis. They advocate its use in health administration education as a means to develop an "ethical rudder" for effective leadership.

The following table demonstrates use of a structured dialogue that, by and large, is based upon this format. Table 1 presents a series of hypotheticals. In each example, pre-existing assumptions are tested and confronted. The use of multiple perspectives and various ambiguities are confronted as well. Opposing viewpoints are brought out into the open, with health administration and non-health administration majors debating the salient issues from their own disciplinary perspectives. This method has proven successful as a means to confront biases and underlying myths. As in the use of the method by Gac et al., error and misunderstanding can be identified and clarified contemporaneously. Mutual respect is a fundamental outcome of this process. Table 1 addresses the issues of aesthetic integrity, regulation avoidance, intellectual property, paying client versus end users' rights, illegal demolition and construction, environmental stewardship, and campus and facility security. These are but seven of any number of salient topics worthy of discussion.

Table 1: Ethics, Health Administration, and the Built Environment

Legal/Ethical Area	**Architecture/Facility Issues**	**Possible Questions and Hypotheticals**
1) Aesthetic Integrity	1) An administrator instructs an architect to work on a hospital building design that he or she knows will be found to be aesthetically offensive to the neighborhood community group adjacent to the institution. 2) Is it appropriate for the architect to proceed with the design?	1) Whose ultimate responsibility is the appearance of the hospital? 2) Should the architect be fired for refusing to follow the client' s directive? 3) Is it the administrator' s responsibility to have been aware of the dilemma he or she was forcing the architect to confront?
2) Regulation Avoidance	1) The architect intentionally mislabels some room titles on the floor plan for a new cardiac care surgical unit. This was done in order to avoid being required to make other changes to the design midway through the design development phase of the architect' s work.	1) Which party is liable for the omission of information on the construction documents? 2) Can the client (hospital) be held liable once the building is completed? 3) What penalties are appropriate for the party found guilty of the misrepresentation?
3) Intellectual Property	1) A local hospital holds an open design competition for its new 250-bed replacement facility. There were four finalists among 56 submissions. The winner is instructed by the CEO to expropriate the front canopy design from one of the finalists and to incorporate this element into the "winning" submission. 2) Does the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) provide guidelines for architectural design competitions for health care facilities?	1) Is the CEO aware of the ethical implications of this directive? 2) Are building designs subject to copyright protections? 3) Is it appropriate to compensate the author of the runner-up scheme whose submission included the canopy? 4) Would such an action put in question the integrity of the entire competition process? 5) What happens if the runner-up author refuses to cooperate?

Legal/Ethical Area	**Architecture/Facility Issues**	**Possible Questions and Hypotheticals**
4) Paying Client vs. End Users' Rights	1) A firm is contracted to renovate four 26-bed post-surgical units in a rehabilitation hospital located in an urban community. The architects are instructed to interact only with the hospital administrative liaison and to avoid all direct contact with the nursing staff, patients, or families until the renovation design has been approved. 2) The architects assert that it is routine protocol to obtain the input of the end users in all their design projects.	1) Do the nursing staff and patient advocates group have a legal right to be a part of this process? 2) Is it ethical for the architects to inform these parties of the situation? 3) If the architects refuse to follow this directive, is this grounds for dismissal? 4) For whom does the architect work? The paying client alone? The end users? A combination of both parties? Does the contract between the architect and owner address this issue?
5) Illegal Demolition/Construction	1) An architectural firm has developed a proposal for a new 350-car parking garage to be built across the street from the new outpatient care pavilion. The design requires the demolition of an historic chapel currently on the site, sidestepping any public review process. The medical center has purchased the entire site, including the chapel, and has given the approval to proceed with site preparation. The chapel is demolished at 6am on a Saturday. 2) Does the architect give the direct order to demolish the chapel, or does the contractor give the order?	1) Is the medical center legally liable for the fate of the chapel? 2) What options are available to local preservationists and city officials at this point? 3) Is the owner (client) legally responsible for damages? The architect? The contractor? 6) What penalties are warranted, if any?

Table 1: Ethics, Health Administration, and the Built Environment (continued)

Legal/Ethical Area	Architecture/Facility Issues	Possible Questions and Hypotheticals
6) Environmental Stewardship	1) The architect asserts that the design for a new outpatient oncology center will reduce energy costs by 40 percent annually compared to the facility it is replacing. But one year after its opening, an energy audit finds that it consumes 20 percent more than the facility it replaced. The architect claims that the heating and air conditioning system was improperly installed, including the solar roof panels.	1) Who must pay for the retrofitting of the facility to correct the problem? Owner? Architect? Engineer? Product manufacturer? 2) What protocols exist to resolve such disputes, if no clear agreement can be reached? 3) Does any federal health care agency have jurisdictional authority in such disputes?
7) Campus and Facility Security	1) The consulting firm responsible for the 10-year campus master plan for an urban medical center claims that the campus structures are clustered on the site and the buildings' exterior membranes are protected in a manner to protect them from external breaches of security. But a routine emergency preparedness drill indicates to the administration that security problems remain because the major buildings on the campus are found to be vulnerable, in stark contrast to the site planners' and architects' claims. 2) The administration approves the construction of a series of concrete barriers at grade level around the perimeter of key buildings on the campus.	1) Who is responsible for paying for the cost of this retrofit measure? Owner? Campus Planners? Architect? Contractor? 2) Does the JCAHO provide guidelines to settle such disputes? 3) Should the administration demand that the planners and architects, at the very last, prepare a plan at their expense to make the concrete security barriers aesthetically attractive? 3) The architects claim that the barriers were never a part of their initial scheme and will therefore not cooperate with the administration on this point.

The Administrator as Informed Client

A second area of likely concern to the student in health administration is the ability to function as a well-informed client—as a successful procurer of the services of the planning, design, and the architectural/engineering (A/E) team. This requires some knowledge of introductory level facility planning and design concepts. Typically, for the health administrator this knowledge is acquired cumulatively through years of hit-and-miss experience. But many a seasoned administrator will confide that facility-related mistakes are often wholly avoidable if one is prepared *a priori* to cope with the complexities and ambiguities inherent in the facility planning, design, construction, and management process. It is prudent to equip the future administrator with some knowledge of design issues and concepts fundamental to the quality of the finished product. These concepts, at once universal and place-specific, are recurrent across building types, geographic locales, and patient constituencies. A small sampling of the many possible issues for discussion are illustrated in Appendix A.

Student Course Evaluations

Students' assessment of these courses over the years has been quite affirmative. They consistently rate them highly on quantitatively based course evaluation forms, providing high to very high ratings in most facets. Qualitative statements on course evaluation forms have centered on suggestions on how to streamline the volume of readings, how to team health administration with architecture students and others on projects, and helpful suggestions for class field trips to local health care facilities. Periodic peer reviews by faculty colleagues have also provided useful feedback. Practicing professionals (graduates or otherwise) in the fields of health administration and architecture have proven to be a particularly valuable source of feedback.

A cautionary note for those who hold a joint academic appointment: It is necessary to maintain open lines of communication with both students and colleagues, as curricula evolve and priorities change, sometimes simultaneously, between two academic departments over time. When bridging two disciplines and teaching in two rapidly evolving fields, it becomes an editorial challenge to select that which is most important to include in curricula. A primary and secondary appointment—i.e., full-time status in one academic unit and adjunct appointment status in the second—is strongly recommended.

In addition to the above, new classroom technologies, including the Internet and alternative curricular formats such as distance learning, are finding increasing institutional support in interdisciplinary coursework. But with the exception of the Taiwan Executive Program, distance learning has not been applied to these courses. The intellectual space in between the fields of health administration and architecture is an invaluable resource, with vast potential to create knowledge to improve the education and careers of both the health administrator and the architect. The course evaluations have been a valuable source of feedback. Practicing professionals who are graduates of one or more of these courses have not at this writing been systematically surveyed about the long-term usefulness of the courses in relation to daily responsibilities. It could be a useful further step to explore empirically the issue of post-graduation validation/invalidation of the coursework. In addition to the formal course evaluations, ample anecdotal evidence suggests that having taken one or more of the courses has functioned as an effective adjunctive component to core required coursework in health administration.

Based on the feedback of graduates over the past 16 years, the courses have had a positive influence on outcome. The net result has been the creation of more knowledgeable laypersons, better-informed consumers of architectural services, and better-informed facility managers. The evidence suggests that these individuals value the importance of quality in health care facility planning, design, and management. To date, more than 1,500 students at Tulane have completed one or more of the courses described above.

Summary and Future Directions

The courses described above were created to draw students together across disciplines to learn about the function of health administration in relation to the built environment as it affects human well being. This synthesis has been fruitful. Interdisciplinism—the systematic linkage across disciplinary and professional realms—can yield otherwise unforeseen insights and perspectives. Such hybridization has become increasingly important in our fast-paced culture (Verderber 1998). Critics have leveled harsh critiques of the contemporary research university as being little more than a collection of competing, fractionalized "silos" (Von Blum 1986; Winkler 1987; Klein 1996). This analogy of mutual exclusivity can be of use in dismantling barriers that work against the pursuit of new interdisciplinary knowledge (Allan 1980; Dill

1982; Dorn 1987; Herder 1996). Moving beyond such barriers, the concept of *consilence* has been put forth to describe the needed blurring of archaic disciplinary boundaries (Wilson 1998). The call for paradigmatic shifts such as this signals the acknowledgment of the growing importance of achieving unification of knowledge. It holds much promise with respect to interdisciplinary teaching and scholarship (Gaff and Wilson 1971; Winkler 1987; Kline 1995).

As for offering a single course or a two-semester introductory course on this subject, a model curriculum is presented in Appendix B, showing major curricular units and topics within each. This information in each case is accompanied by one or more key books and articles from the considerable and growing international literature on this subject. It is hoped that more health administration programs in the United States and other nations will begin to include, in earnest, at least one course on this subject. Such a course can be offered as a required core course, as in the case at Tulane with respect to the MHA and MMM executive format degree programs. Alternatively, such a course may be offered for elective credit only. It may be possible in some situations to have some students enrolled in the course as a required core course and others enrolled who receive elective course credit.

Conclusion

Unlike the slow, tedious ladder of career and salary advancement for the aspiring architect, health management professionals tend to rise much more rapidly, sometimes ascending to positions of authority within only a few years of receiving a graduate degree. In contrast, the architect must complete a three-year period of apprenticeship under the tutelage of a registered architect, as well as a comprehensive, nine-part licensing examination process. The recent health administration graduate's first assignment might entail the oversight of a complex facility construction project such as a renovation, a wing of a hospital, or a freestanding building. Therefore, the levels of authority vested in the recent architectural graduate tend to differ markedly from that of the recent health administration graduate. For the latter graduate, this "trial by fire" approach, as mentioned at the outset, has been employed as a rite of passage in health care administration practice in order to develop knowledge and a feel for the organization. At Tulane, this experience has often occurred in the residency period preceding graduation. The aspiring architect learns, on the other hand, strikingly little while in school of how actual buildings are put together—how they are constructed. This

disconnect between theory and professional practice continues to bedevil relations between the architectural profession and schools of architecture in the United States (Boyer and Mitgang 1996; Monaghan 2001).

The fields of health administration, architecture, and health care facility management largely developed during the 20th century. Their long-term existence is fragile. Critics in these fields clamor for additional course content; one example in health administration is the call is for the administrator to be a more adroit clinical decision-maker (Carpenter, Proenca, and Nash 1998). A recent issue to emerge for the health facility manager is the need for the design of a hospital, clinic, or medical center to preclude hostile acts such as bioterriorism. Architects do not have a monopoly on the production of built form, nor do professional health administrators on the delivery of health care. With that said, it would be prudent for health administration programs to offer at least one course, elective or otherwise, on this subject. Over a 15-year period at Tulane (1985-2001), no more than a third of all traditional (day) program MHA graduates completed one or more of these courses as an elective. This percentage is about 40 percent for MPH graduates, and 100 percent for executive format MHA graduates (dating from the program's inception in 1992) and for MMM graduates (dating from that program's inception in 1998).

A likely reason for the low percentage of traditional MHA program graduates having taken one or more of these courses is a critical, persistent shortage of room for electives within the Accrediting Commission on Education for Health Services Administration (ACEHSA) accredited MHA curriculum at Tulane. Nonetheless, based on student course evaluations, it should be restated that the health administration students who have taken one or more of these courses have found the experience to be useful to their overall education. There are numerous ways to establish one course on this subject, but the most obvious operative model is to establish a linkage with the affiliate architecture program on campus, where such a link is possible. As with any interdisciplinary undertaking, the willingness to make it succeed in pedagogic as well as in logistical terms remains a prerequisite condition. This can be a challenge that some programs may deem worthwhile, particularly since this subject area as of 2001 remains outside the realm of ACEHSA-accredited program criteria. Regardless, the effective planning, design, management, and stewardship of environments for health is predicted to rise significantly in importance as world population increases dramatically.

The function of the built environment in health administration education and practice becomes more significant to both for-profit and non-profit health care organizations. The general public, the core constituency for the industry's services, is also becoming more knowledgeable and attuned to the therapeutic potential of effective, supportive, user-friendly architecture in health care settings. The health care executive is in a prominent, unique position to advocate for quality architecture and facility management as a fundamental intervention—a basic amenity—that contributes to the health and well-being of both one's organization and to the health of society.

Notes

1. As a case in point, the share of Americans age 85 and older is the fastest-growing segment of the U.S. population. Architectural advancements have evolved concurrently with alternatives to the traditional nursing home. The ranks of the 85+ surged 37 percent during the 1990s while the total U.S. population rose just 13 percent. Traditional nursing institutions housed 1.8 million elderly Americans in 1994, but by 1999, only 1.6 million; many chose one of the burgeoning number of assisted living facilities. Assisted living facilities emerged in the 1990s as a freestanding, less costly building type. These care settings saved $19 billion in health care expenditures in 2000 alone. By comparison, the annual cost of nursing home care during this period had risen to an average of $47,000 per resident (U.S. Census Bureau 2001).

2. This author has held a unique joint faculty appointment between Tulane's School of Architecture and the SPHTM since 1985. The "home school" in this case is architecture, whereas the "home away from home" school appointment is in the SPHTM (HSM). This is the only interdisciplinary faculty appointment of its kind in North America, and perhaps one of very few worldwide.

3. They are offered for graduate credit to students in the SPHTM and the School of Medicine, and for undergraduate and graduate credit in architecture, and to other students with the permission of the instructor (Courses 1 and 2 only). Course 1 is typically taught in the spring, Course 2 in the fall, and Course 3 in the summer. All three are offered as electives. This sequence allows the HSM students to develop an area of concentration in facility planning and management. In addition, two variants of Course 2 are taught as required courses, once per year: a version taught to students in the aforementioned Taiwan Master of Medical Management degree program, and a version taught to students in aforementioned the Executive MHA degree program. Course 1 was first offered in 1985-86, Course 2 in 1992, Course 3 in 1988, and the two required course variants of Course 2 in 1992 and 1998, respectively.

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Appendix A: Site Planning and Architectural Issues Routinely Encountered in Health Administration

Site Planning/ Design Concept	Architectural/Facility Issues	Possible Questions and Hypotheticals
1) Human Comfort and Well Being	1) During the past year, the occupants of the pediatric care pavilion have experienced a significant increase in the rate of airborne infection. 2) The staff has also experienced an increase in respiratory ailments during this period. 3) What can be done to remedy this problem? 4) The medical center's full-time facility manager has been in charge of indoor air quality during this period.	1) What steps should the facility manager have taken to preclude this situation? 2) What operational and reporting procedures were in place during this period? 3) When the cause is identified, should it be disclosed to the patients and their families? 4) What measures can be taken to ensure this problem does not recur?
2) Contact with Nature	1) Each patient care suite in the new pediatric wing has a sliding glass door that opens directly to an exterior patio and garden. This feature of the facility, as well as other uses of nature as a therapeutic modality in treatment, was highlighted in marketing materials. Three months later, the administration subsequently forbade the use of the doors, an, by default, the patios. Two nurses who violated this directive were dismissed.	1) What scenarios could have warranted this facility management policy? 2) Do the nurses have a legitimate, wrongful dismissal case? 3) If so, who is named as the defendant in the suit? 4) Is there empirical evidence on the therapeutic amenity of direct contact with the exterior environment of a health care setting? 4) What effect might this policy have on future marketing and public relations?

Site Planning/ Design Concept	Architectural/Facility Issues	Possible Questions and Hypotheticals
3) "Wayfind-ing" and Spatial Orientation	1) In a long-term care setting, constructed in 1966, an 87-year-old female resident tripped and fell on her way to the dining room. She stated that the lack of proper signage and lighting caused her to fall. The administration had approved an interior designer's proposal for an interior renovation that would include new lighting, carpeting, a new color palette, furnishings, and new directional signage.	1) Is the institution at fault for not upgrading its facility sooner? 2) Can the institution's prior approval of a forthcoming significant modification to its facility be sufficient to dismiss any legal claims brought forth by the resident's family? 3) What code requirements or accreditation minimum standards exist for interior "wayfinding" and signage systems, if any?
4) Appropriate Level of Environmental Sensory Stimulation	1) The noise level on a patient care unit was pinpointed by the nursing staff as an antecedent source of stress. A group of nurses threatens to resign unless the administration takes corrective action.	1) Does empirical evidence exist on appropriate noise levels in patient care units? 2) Do minimum-maximum standards exist as mandated by code or accrediting agencies? 3) Can it be determined that noise alone is the root source of the stress experienced by the staff? 4) Are patients being similarly affected? How can this be ascertained?
5) Sustain-ability	1) A recently built community hospital markets itself to its community as a "green" neighbor. But a local environmental advocacy group claims the institution has been improperly storing and disposing of its biohazardous waste materials on site. 2) The group claims the hospital's site was improperly designed to be used in this manner, and is violation of local zoning and federal Environmental Protection Agency regulations.	1) What protections does the institution have to counter the group's claims? 2) Is the architect liable if the site plan is found to be in violation of local zoning regulations? 3) What is the definition of a "green" facility from the standpoint of sustainability?

Site Planning/ Design Concept	Architectural/Facility Issues	Possible Questions and Hypotheticals
6) Growth and Change	1) A high degree of internal flexibility is called for in the design of a new outpatient primary care clinic. Yet after two years of use, it is discovered that the facility's interior walls are not relocatable, as initially claimed by the architect. 2) As a result, the cost of the retrofitting was found to far exceed that claimed by the architect prior to the building's construction. The architect claims the system was improperly installed.	1) Can the administration rightfully expect the architect to pay for the subsequent renovations? 2) If the architect disputes the matter, is mediation an appropriate route? 3) Is it the architect's responsibility to identify the source of the problem? Is it the administrator's responsibility? A third party?

Appendix B: Model Curriculum for a Survey Course in the Planning, Assessment, and Management of Health Care Environments

Curricular Unit	Baseline Content	Key Readings
1) Overview of Key Historical Developments in 20th Century Environments for Health Care in Health Architecture	Visual Survey of Landmark Buildings Representative of Six Waves of Historical Trends	Verderber and Fine (2000) Goldin (1994)
2) Introduction to Key Concepts in Environmentand Behavior with Respect to Health Facilities	Wayfinding/Universal Design Personalization and Territoriality Residentialism in Health Care Nature as Therapeutic Modality Environmental Stress	Lang (1987) Topf (2001) Preiser and Ostroff (2001)
3) Introduction to the Facility Planning and Construction Process: Project Inception to Opening Day	Feasibility Assessment Market Analysis Campus Master Planning Budget Development/Approvals Schematic Design Design Development Construction Documents Project Specifications Bidding/Approval Process Construction Management Project Completion/Occupancy	Hemmes (1993)

4) Discussion of Ethical Issues in the Planning, Assessment, and Management of Health Care Facilities	The Reflective Health Executive The Architect-client Relationship Involvement of the End User Involvement of Family Caregivers and Staff Constituencies	Mayo (1988) Gutman (1988) Wasserman, et al. (2000)
5) Introduction to the Facility Programming Process (1995)	Capital Construction Cost Analysis Mission Statement (facility-based) Goals/Performance Requirements Space Narratives (Room-based) Total Project Cost Analysis Schedules/Construction Oversight Professional Services Contracts Close-out/Conflict Resolution	Kumlin Haggard and Hosking (1999)
6) Introduction to the Post-occupancy Evaluation and Facility Management Process	Facility Needs Assessment Occupant Needs Assessment Videography/walk-through Organizational Behavior	Becker (1983) Preiser (1993) McLarney (1991) McConnell (1993)
7) Introduction to Contract	A/E Contract Documents Negotiation Construction Management Resolution of Legal Disputes Reading Blueprints Workshop	Ballast (1998) Hemmes (1993)
8) Future Trends in Health Facilities Planning, Assessment, Design, and Management	Architectural Innovations Management Innovations Health Science Innovations Broad-based Societal Trends	Verderber and Fine (2000)