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Designing for Health: At the Center of the Perfect Storm that is Redefining How We Teach

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Educators in the area of design for health find themselves at the intersection of two already mature and robust knowledge disciplines: architecture and public health. This has the benefit of tapping into well-developed scholarship in each field. Both architecture and public health enjoy a long legacy of well-conceived pedagogy both in their respective curricula, and also in the matters of internship, field training, and professional practice. However, in the intersection of the two disciplines practitioners, professors, and students in both fields are maneuvering to exploit undergraduate, graduate, and post professional training that offer study and practice opportunities ranging from a basic understanding of the impact of design on health to rigorous research pathways exploring the actual mechanisms of design's influence on human health.

But this surge of interest and activity in designing for health is surviving in the midst of a perfect storm of forces challenging the maturation of this field: 1) confusion over the meaning of designing for health, 2) uncertainty about how to properly manage the integration of knowledge areas in multi-disciplinary fields, and 3) reservation about the role of research in this emerging field.

CONFUSION

There is confusion about what it means to "design for health." Although it seems intuitively clear that the subject involves two disciplines, design and health, it is not necessarily clear whether this refers to the design of hospitals, a specific building typology, or to something else more akin to the design for health and wellness, which is applicable to every building type. It is likewise unclear what scale should be applied to the field. Is this a discussion of matters at the product scale, room scale, building scale, urban scale, or even regional planning scale?

Consider these examples of organizations using the words design or architecture and health in their title. While those close to the industry and who know these entities can perhaps identify their alignment and focus better than most, it may not be immediately clear to the average interested party whether these groups are focused on designing for health and wellness or healthcare facilities. While this list is not exhaustive, it serves to illustrate the point.

1. The **Design and Health Leadership Group** at the American Institute of Architects.

2. The **Design and Health Research Consortium**, also at the American Institute of Architects.

3. The **Academy of Architecture for Health**, a knowledge community at the American Institute of Architects.

4. The **Center for Health Design**, an independent 501(c)(3) organization.

5. The **International Academy for Design and Health**, headquartered in Stockholm.

6. The **Center for Health Systems and Design** at Texas A&M University.

7. The **Center for Design and Health** at the University of Virginia.

8. The **Architecture + Health** program at Clemson University.

9. The **Design Institute for Health** at the University of Texas.

10. The **Institute for Health + Wellness Design** at the University of Kansas.

The confusion is real, and the profession needs to understand both design that is aimed at creating places that enhance health and wellness, as well as design that creates healthcare places where health can be restored. It is perhaps best illustrated by this quote attributed to Hippocrates:

> "The function of protecting and developing health must rank even above that of restoring it once it is impaired."

The confusion is more that theoretical. A real life example of this confusion involves the Board of one of the aforementioned organizations. After a protracted period of courtship between Board members of organization A and a donor/ sponsor, the Board member asked the donor if organization A could count on their financial support. The donor responded that indeed that support was in place and the check had already been sent. The Board members responded that they had not received the check. The sponsor affirmed the activity, and reiterated that the check had been sent to organization B. To the dismay of Organization A's Board members the check had been sent to an organization with a very similar name and with a roster of active individuals with considerable overlap to organization A. The donor seemed quite pleased to be able to affirm the sponsor's support of the organization requesting the support, and was seemingly completely unaware of the difference between organizations A and B.

INTEGRATION

A second force contributing to the perfect storm surrounding the concept of designing for health is the question of how to teach the integration of multiple disciplines for the purpose of achieving richer, potentially more successful solutions. And which disciplines should be involved to achieve the richest, most robust intersection of design and health?

One point to consider is the difference between the terms "integration" and "multi-disciplinary." Many use the terms virtually interchangeably, but they are particularly different. For example, it would be highly unlikely that a medical professional would use only one test to make a differential diagnosis on a patient's health status. Typically, a clinician would invite multiple tests or measurements on a patient, coupled with multiple enquiries directed to the patient – in other words, a multi-disciplinary evaluative environment - from which the findings would be integrated into some conclusions about the patient's health and subsequent recommendations about a path forward to better health.

Similarly, a kitchen often is multi-disciplinary in character, with dry goods, frozen goods, canned goods, refrigerated goods, spices, cooking utensils and serving pieces, to name just a few typical elements, but it is the integration of those elements into a recipe for food preparation and a protocol for presentation that yields the magic of fine cuisine.

In like manner, an artist's lair is a multi-disciplinary environment. The palette might have dozens of different colors available for use,

and an extensive variety of implements (brushes, fabrics, blades, etc.) for spreading those colors to a number of different surfaces (paper, canvas, skin). Nevertheless, the magic is not in having the multi-disciplinary artist environment, but in the integration of elements therefrom to create pieces of art.

The same is true for designing for health. It is not a multi-disciplinary curriculum that determines success, but the integration of the disciplines that matters most.

Beyond the focus on the art of integration, the question arises as to what elements should be integrated. The happy news is that the answer to the question is essentially unlimited. Numerous disciplines emerge from the Venn diagram intersection of design and health, including beyond public health and design, for example: agriculture (planning to avoid urban food deserts), transportation engineering (traffic planning to avoid both pedestrian and vehicular accidents), mechanical engineering (offering high quality indoor air quality), business (providing the value proposition studies on the features of health design), and law (both the liability implications of designing for health and the policy/ legislative possibilities in the field).

In the early 1990's Jim Bills, then a Vice President with IT giant Novell, made this statement at a gathering of representatives of the electronics industry:

> "We are no longer an industry of vendors; we are an industry of integrators."

His point, simply, was that to a very large degree the electronics industry was no longer selling what it manufactured, as had been the case in the early years of the field. Instead, to a large and growing degree, the industry was having electronic components designed and built by experts in various engineering and manufacturing domains within the industry, and then integrating (assembling) them into a product under a brand name for sale.

The parallel to the emergence of design for health should be obvious. Architecture, like the electronics industry, is no longer an industry of vendors; it is an industry of integrators. No longer is the "master builder" concept applied to the professional who designs, engineers, assembles, and sells a final product or building in a silo. Rather, the Architect is an integrator of market-best products and services to create an environment within which activities occur, and to the point of this article, within which the health of occupants is impacted.

Proper training of young and aspiring professionals, both in design and in health, must pay appropriate attention to not only considering the breadth of issues impacting design and health, but also to thoroughly exploring and evaluating the implications for an unlimited variety of integrated perspectives of those issues in their practices. And at all times, the clarity of whether the discussion is about designing for health and wellness, or designing for healthcare, must remain spotlighted.

RESEARCH

Research is having a profound impact on all academic disciplines, and particularly so those related to health: medicine, nursing, public health, and others. The same is true for the design fields, at all scales, among all design specialties. By natural extension, the field of design for health is being significantly impacted by the advances in research in the disciplines that contribute to that field.

This phenomenon of research impact was clearly explained by Jerome F. Strauss III, MD, PhD, Dean of the VCU School of Medicine. He pointed out that research, because of its conduct increasingly at the molecular scale, has allowed scholars to see just about anything in terms of anything else. The result is a profound transformation of all aspects of professional scholarship, including education, research and practice. While Dr. Strauss' remarks were aligned specifically with the medical and related fields, research is having a similar impact across virtually all academic disciplines.

This has triggered a full reassessment of curriculum development. In medicine, for example, nearly gone from the academic landscape are the silos of knowledge. No longer is medicine taught primarily from the perspective of learning about individual disciplines in a sequential manner, with their interrelationships being addressed downstream in residence and internship experiences. Rather, medicine is increasingly being taught early in the curriculum in smaller blocks of content characterized by the ways multiple knowledge areas integrate to explain health and disease patterns, with those interactions reinforced by residency and internship. It is a pedagogical shift not limited to medical schools.

Research itself, both its agenda, conduct, and translation, has shifted as well. Where laboratories were once focused nearly exclusively on understanding singular mechanisms and chemical reactions, increasingly the research agenda is looking at the interactions that contribute to the things research labs study. And with the ability of science to understand our world at a molecular level, researchers are more often able to ask questions about interactions at the molecular level. In effect, they are able to see just about anything in terms of anything else. This has created a shockwave of innovative research activities previously impossible to perform, resulting in a depth of understanding on the multi-disciplinarity of the physical, chemical and biological sciences heretofore unimaginable.

And the impact of research of this kind on the profession? It has, in all likelihood, created a wave of accelerated professional obsolescence to a degree that the medical profession has never imagined. At increasingly younger ages clinical professionals will be faced with the decision of whether to continue practicing with knowledge that is no longer fully current, or retire before the risk of practice under the previous circumstances becomes too great, or return to the source of the research to be retrained for currency in the field. The implications for practitioner career cycles, and the role of research in determining practitioner behaviors, may be greater than ever before.

Research in designing for health is experiencing many of the same forces as medicine, and is likely to do so to increasing degrees in coming years. The ability to study nearly anything in terms of virtually anything else is an intoxicating possibility. Imagine studying the insulation values of construction materials in terms of energy costs in terms of health effects of thermal comfort on occupants in terms of lighting levels in terms of academic performance in schools. Or consider the power of reviewing life cycle cost analyses of healthcare facilities in terms of lighting levels in terms of medication errors in terms of medical outcomes in terms of nutrition and exercise impacts on health and wellness in terms of public policies on health insurance and reimbursements. Things that are obviously related, though perhaps not fully understood in that relationship, as well as things seemingly unrelated initially but ultimately intertwined, can be studied with fresh eyes for their implications for creating environments that most effectively contribute to the health of a nation.

In a 2008 survey conducted for the American Institute of Architects (Hamilton and Pentecost) participants were asked several questions about research in their architecture practices. The results suggest that research has a strong influence already. At the time of the survey:

- 86% of respondents indicated that a client had asked them for a research-based design or to research a specific question that would impact the design.

- 98% of respondents indicated that they found using evidence allowed them to achieve better design outcomes.

- 71% of respondents indicated that their firm had engaged a consultant (academic or other outside expert) to help with an evidence-based design project.

Nevertheless, at the time the survey was conducted, only 33% of the respondents indicated that their firm had someone formally trained in research methods who was heading up research initiatives. But whether through in-house expertise, or through a relationship with the research communities associated with designing for health, the design profession seems to be moving to acknowledge the role of research to impact their practices.

> "In the last decade, we have seen an increase in practices that are integrating research into their design processes and services". Ajla Aksamijua (see David D. 2015)

As the implications for the likely impact of research on design for health, as articulated by Dr. Strauss for the medical field, become more real and pervasive in practice, both design and health professionals will need to incorporate research thinking into their practices to increasing degrees. The possibilities for research to transform our understanding of this intersection of two academic disciplines are unlimited.

THE ACADEMIC RESPONSE

Within this swirl of forces, creating turbulence for practitioners and academics alike, comes a vision for a curriculum that both recognizes and responds to these forces in a way that empowers the profession to a more enlightened practice. This vision was developed by considering two programs at two adjacent universities, College of Architecture at Texas Tech University, and the Public Health Program at Texas Tech University Health Sciences Center.

The task began with an in-depth review of the administrative and intellectual cultures of the two universities and mapping the three 'storm forces' within an academic environment. This loosely corresponds to the following: the 'force' of 'multidisciplinary integration' is seemingly at odds with curricular boundaries, made famous by movies such 'Ivory Tower' (Rossi, 2014), and associated mindsets that sometimes effectively produce barriers to making bridges. A related factor is that every university has its own operating policies and is driven by its administrative and intellectual cultures (Sporn, 1996). Third, the confusion regarding the 'health and wellness design' has curricular repercussions that will be discussed at length later. Finally, research itself has disciplinary boarders that need to be acknowledged, understood and addressed. The following sections discuss the translation of the three 'forces' into specific settings of two adjacent institutions and moves on to explaining the designed program. Figure 1 illustrates the translation of the three 'forces' into a university environment.

HEALTH AND WELLNESS CONFUSION AND THE CURRICULUM

As demonstrated in the previous section, the term 'health' is broadly used in the academia and outside. In the universities it is used by different disciplines, and needless to say, in their own specific ways. For example, at Texas Tech University, different groups focus on such things as healthcare law, healthcare engineering, health communications, health organization management, healthcare facilities design etc. Each of them characterize health from their own disciplinary points of view. Of course, Texas Tech University Health Sciences Center, is a medical school and is all about health and healing.

Creating a design-focused curriculum for health and wellness in such a specific academic setting naturally shifts from considerations of the 'ideal' to messy negotiations regarding academic points of reference, course offerings, prerequisites, and abilities of students as they would cross disciplinary boundaries. All of these underpin another, and perhaps the most significant 'storm force', integration of multidisciplinary aspects.

INTERDISCIPLINARY, MULTI-DISCIPLINARY AND INTRA-DISCIPLINARY DISCUSSIONS

The notion of a 'paradigm' is central to disciplines (Kuhn, 1962). Disciplinary work is usually done by a group of scholars who address specific issues using a common set of parameters. In multidisciplinary work the subject under study is approached from different angles using different disciplinary perspectives (Van den Besselaar & Heimeriks). Another way to think about this is that multidisciplinary work brings methodologies from one discipline to focus on problems and on-going projects in another. In this scenario, the work retains a discipline's conceptual and theoretical identity, but the focus area or problem may be in a different discipline. On another hand, interdisciplinary study create its own theoretical, conceptual and methodological identity. It requires an
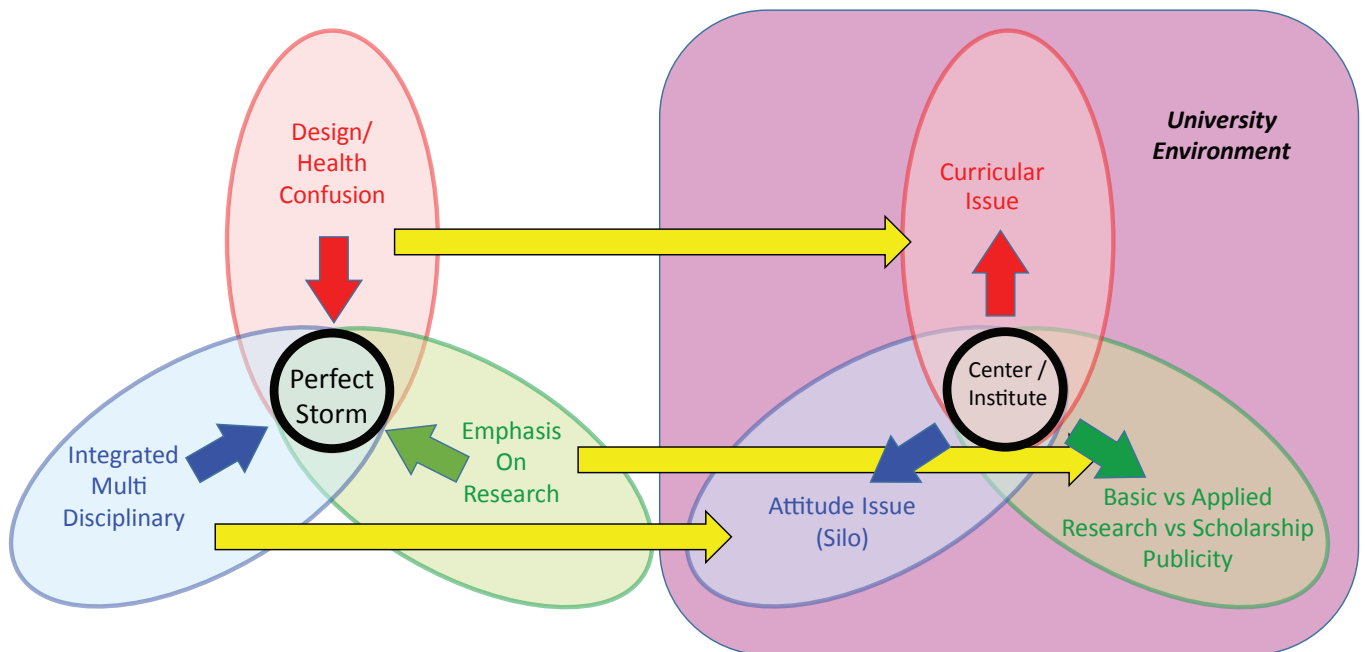

Figure 1: Mapping the 'storm forces' into a university environment.
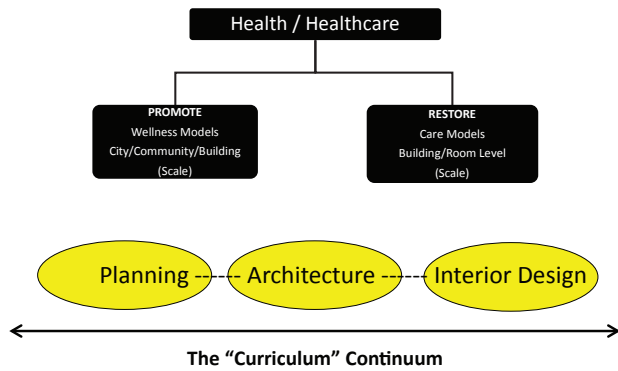
Figure 2: Intra disciplinary issues and the 'curriculum continuum'.

understanding of methods and analytical frameworks of more than one discipline to examine a topic (Van den Besselaar & Heimeriks). Naturally, interdisciplinary work is more integrated, but a multidisciplinary approach is a suitable beginning. In both scenarios however, improved communication skills between compartmentalized systems of knowledge are enhanced.

From the discussion in the beginning segment of this paper, health and wellness education should move to an interdisciplinary format, but at this nascent stage, and after evaluating the possibilities and problems in the two education settings, a multidisciplinary approach was adopted. Administratively this made sense, because it allows individual disciplines to continue their own agenda and participate in this new program; yet keep open the eventual transition to an interdisciplinary format.

Because of the administrative structure at Texas Tech University, some intra-disciplinary issues surfaced and had to be acknowledged. The notion of wellness takes into account prevention, and lends itself naturally to large scales of regions, cities, neighborhoods, and perhaps buildings. From a disciplinary point of view, it involves regional and city planning, landscape, and architecture. At the other end of the scale, restoration of health includes care models which are usually considered at a smaller scale, i.e. architecture and interior design (see figure 2). From these considerations a continuum of the curriculum was identified. This factor is important because in many schools design education is often compartmentalized into interior design, landscape architecture, architecture, and city & regional planning. More departments, perhaps by administrative necessity, create more borders that are contrary to a unified curriculum.

THE CONCEPT OF RESEARCH

While the concept of research is more catholic, its methods vary across disciplines. In the design of a curriculum, this is a valid question to ask. Architecture scholars' research have traditionally used the entire spectrum of research methods; from humanistic to scientific. Thus, while this seems to be an advantage for architecture students, actual researchers in each program may be biased towards certain methodologies. Nevertheless, the concept of research was

accepted as the common denominator between many disciples who are expected to partner in this endeavor. This also fit quite well with the 'storm force' of research, discussed earlier.

THE PROPOSAL: MS IN DESIGN AND HEALTH COORDINATED THROUGH AN INTERDISCIPLINARY INSTITUTE

The conditions on the ground were examined at great length. We understood that the scale was broad and the scope multidisciplinary. Additionally, we also took into account the background of students that were expected to enroll, the time constraints necessary to make an attractive program, and finally, we had to relate the new proposal to the structures of existing degrees.

The College of Architecture at Texas Tech University had in place a 34 hour MS degree with specializations, and related graduate certificates. Specifically, it had a certificate in 'Healthcare Facilities Design'. We debated the notion of a post-professional degree and elected not to use this nomenclature, as we wanted this program to be accessible to students without a design degree. This of course posed additional challenges. In the end we created a program with two tracks, one that did not expect design skills from incoming students, while the other had accommodations for the non-design student. Essentially it was the aspect of research, both its production and its application, that was considered to be the central theme of this proposal.

The final proposal was an MS degree with a specialization in Design and Health (see figure 3). It has two tracks to address the curricular continuum that was mentioned earlier. One was 'Healthcare Facilities Design' where the focus would be on creating buildings and other facilities where impaired health is restored. Among the related disciplines, architecture, interior design, engineering, product design, nursing, business, etc would be the expected participants. On the other hand, the second track, 'Health and Wellness Design' is about the creating and maintaining wellness. In general, we expect the scale of this to be broad. Architecture, landscape architecture, planning, public health, are some disciples that are expected to be active in this.

Figure 3: Proposed MS and certificates (Proposed are underlined)

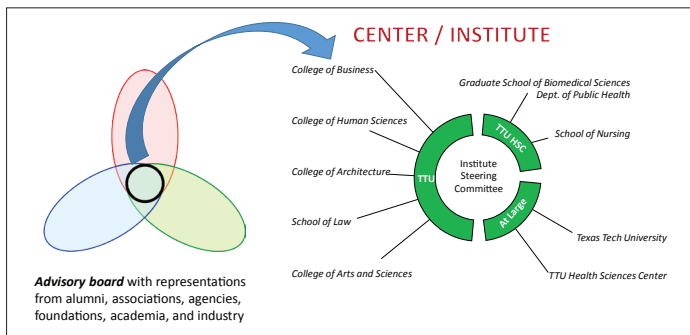Designing for Health: At the Center of the Perfect Storm that Is Redefining How We Teach

Figure 4: The concept and structure of the proposed Institute

An important question to ask of a new curriculum is, what would it look like to the incoming students? The thrust of this program is interdisciplinary and research based. We identified a whole suite of elective classes from many disciples in the two universities. For example, at present we have included twelve courses from the school of Biomedical Sciences, four from Interior Design, twelve from Nursing, two from Business and three from Law. The idea is for students to understand the paradigm of their background disciplines and use this to investigate problems in healthcare and wellness, and for the program to provide expanded flexibility.

We also understood that an academic program without an alliance of faculty cannot be sustainable. Additionally, this program is situated at an intersection of two universities: a medical university and a regular one. Therefore, the coalition of faculty and researchers is a significant part. To address this need, we have proposed an institute which will be the center of all related activities (see figure 4). This will be represented by all the interested disciplines. Its charge will be to create and distribute educational materials for the students as well as professionals in the health and wellness industry and to undertake sponsored and non-sponsored research to generally enhance the larger missions of the universities. Essentially, as figure 1 demonstrates, this institute would be at the center of all related activities.

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