



Outside the Ivory Tower: The Role of Healthcare Design Researchers in Practice

Sheila Bosch, Ph.D., Gresham, Smith and Partners, and Upali Nanda, Ph.D., American Art Resources

A growing body of research in evidence-based design (EBD) demonstrates that elements of the physical environment correlate with health-related outcomes. This has prompted hospitals across the country to recommend that the architects and designers they hire have demonstrated experience in EBD; that they know both how to apply existing EBD studies and conduct and publish their own research. As a result, healthcare design-based firms have responded by hiring researchers trained in a doctoral program. With titles like “Director of Research,” these individuals are advancing the awareness and appropriate application of research findings, as well as contributing original, empirical studies to the field of EBD. These researchers may also conduct postoccupancy evaluations and provide education, both internally and externally. Initiating a research unit within a design firm is no easy task, and requires skills above and beyond being a solid researcher. This role is ideal for the person who wants to keep one foot in academia, but is less interested in pursuing a tenure-track position. Only a small percentage of design firms have doctoral-level researchers on staff. Ultimately, the fate of in-house researchers rests on their ability to add value to the firm—to spur innovative design solutions, to increase the firm’s credibility, and to help win work.

Introduction

Traditionally, undertaking a Ph.D. has been perceived as walking the path to a career in academia and research, irreconcilably divorced from practice. Academicians were expected to live in their world of theory and words, while design practitioners create a physical world with bricks and mortar. Although some doctoral graduates decide to practice, and there are instances of practitioners who elect to pursue a Ph.D., too often one must choose between the two worlds of research and practice. In recent years, however, a new role has emerged. Some progressive design firms are now embracing researchers in architectural practice, particularly in the area of evidence-based design (EBD).

EBD is defined by the Center for Health Design as “the process of basing decisions about the built environment on credible research to achieve the best possible outcomes (Center for Health Design [CHD], 2008).” Although EBD may be applied in virtually any building type, it has its roots in healthcare design. A growing body of research demonstrates that elements of the physical environment (such as lighting, acoustics, layout, views, etc.) correlate with health-related outcomes (Ulrich et al., 2008). This has prompted hospitals across the country to recommend that the architects and designers they hire have demonstrated experience in EBD; that they know both how to apply existing EBD studies and conduct and publish their own research. Increasingly, clients are looking for those individuals who are accredited through the Center for Health Design’s Evidence-based Design Accreditation and Certification (EDAC) program.¹ The role of researchers in architectural practice is expanding as well. As Kirk Hamilton (2007) stated, “In the area of evidence-based design we have a growing number of serious researchers in a variety of fields, at a large number of institutions and organizations, and in different parts of the world who are producing research related to healthcare environments.” These “serious researchers” in design practice frequently have a doctorate in architecture, interior design, psychology, or a related discipline.

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Why Research?

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So, what motivates for-profit healthcare design-related firms to seek out researchers? Here are four key drivers:

1. Researchers can help firms establish themselves as design leaders, demonstrating a commitment to learning and innovation.
2. Researchers in practice create an extension of the academic learning environment for design professionals and help bridge the gap between the two worlds of academia and practice. Oftentimes, academicians develop information that is not immediately applied, but researchers in design firms have a responsibility to their real-world clients to innovate in a manner that results in the attainment of specific (and often immediate) project design goals.
3. Researchers on board may increase a firm’s credibility as a forward thinker.
4. Researchers demonstrate an investment in “doing the right thing” by incorporating research into design and contributing new knowledge to the field, which may promote goodwill toward the firm, as well as increase the intellectual capital within the firm.

The multifaceted role of the researcher in practice at firms includes that of a librarian, teacher, marketer, researcher, and guinea pig. This role is particularly well suited to those who enjoy having one foot in academia, but are less interested in pursuing a publish-or-perish tenure-track position. For the researcher fresh out of academia, the world of the industry can be a revelation. Oftentimes this person is forging new territory where there are no other researchers in the firm. Yet, it is a rewarding role, rich in opportunities to be creative and make a positive difference in the lives of patients and healthcare staff. Typically, this role will involve, at a minimum, efforts related to research, education, assessment, and advancing the research agenda. Examples of design-based firms that support a doctoral-level researcher include Gresham, Smith and Partners (GS&P), American Art Resources (AAR), HKS, HOK, and Ellerbe Becket.

Levels of Research

To a researcher in a healthcare design-based practice, the term “research” encompasses two distinct categories—using existing evidence or “information gathering” and conducting original research. Both define the life of a researcher in practice.

Application of Existing Research Evidence

Researchers in healthcare design are committed to effectively translating existing research into real-world applications with clients. Typically they are responsible for identifying and acquiring relevant research literature, summarizing it, and making the information available to others in the firm. Requests for this type of assistance are common and researchers are advised to organize the information for easy access. For firms with a research unit, existing evidence is an important part of the healthcare planning and design process. Based on client goals and budgets, designers strive to maximize opportunities to apply evidence with demonstrated positive effects on patient and staff well-being, without improperly generalizing findings

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from one setting or population to another. The fact is that in spite of the growth of EBD, the quantity and often the quality of the research remains quite limited. Critical evaluation of the existing evidence is crucial.

For firms with researchers on board, applying existing evidence to each project has become commonplace, particularly in the areas where there is strong evidence (e.g., daylight, nature, noise). For example, there is good evidence that daylight and access to nature provide many benefits for patients and staff in the acute care environment (Ulrich et al., 2008). One example of this application is seen at Baptist Medical Center South in Jacksonville, Florida, which boasts an ambulatory concourse opening to gardens that were created to improve wayfinding and provide vistas and daylight. The project won the 2006 IIDA Form Award for Healthcare in recognition of these and other EBD attributes. Patient and family satisfaction scores on average have risen in this facility, although it is impossible to ascertain what percentage (if any) of the variation in scores is uniquely due to design elements.

Assessment

Assessing the success of past projects through postoccupancy evaluations may be one of the responsibilities of researchers in practice. For example, a postoccupancy evaluation conducted by GS&P in an emergency department (ED) of a central Florida hospital utilized interviews, observation, and informal discussion with staff members. In addition, some key ED data were extracted from the hospital database. When comparing data for 12-months pre- and postoccupancy, average patient wait times were reduced. The time patients waited between entering the ED until seeing a care provider (door-to-doc) dropped 20% and the time from entering and leaving the ED (door-to-departure) dropped 11%. The total average length of stay in the ED dropped 7%. The average monthly left without being seen (patients who entered the ED but did not wait long enough to see a provider) also dropped 24%. The success of the new ED is plausibly contributable to outstanding leadership, process modifications, and the new facility design. Postoccupancy evaluations may also identify areas for improvement. For example, this evaluation demonstrated that the bereavement room would be better utilized if it were closer to the zone in which the most critical patients are seen, rather than at the other end of the department near the lobby.

M.D. Anderson Cancer Center represents another example of a client who decided to take an evidence-based approach and then assess the strengths and remaining challenges in its facility postoccupancy. The client decided to implement a strictly evidence-based art program consisting exclusively of nature images and figurative art that followed evidence-based guidelines. A postoccupancy evaluation of the art program demonstrated that both patients and staff responded positively to the art, which improved the overall perception of quality of care and branding of the hospital (Hathorn & Nanda, 2008).

While postoccupancy evaluations do not typically fall under the purview of rigorous research (since they often do not compare the conditions to “before” the intervention, lack rigorous controls, and often fail to address nondesign-related factors that may affect the observed findings), they are invaluable to designers and healthcare administrators for revealing how patients, families, and staff received their design decisions. The researcher in practice runs the risk of focusing only on positive findings, as a basis for marketing, and must be careful to accurately report both positive and negative findings from postoccupancy evaluations.

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Conducting Original Research

Recognizing the extensive need for additional high-quality investigations, researchers in practice contribute to original, field-based, or laboratory-based empirical evidence to the body of knowledge. Costly decisions are made every day by healthcare administrators, but existing research evidence to support the decision process is often insufficient or nonexistent. So, the work of trained researchers is extremely important for advancing EBD. Research in EBD utilizes qualitative, quantitative, and mixed methodological approaches. The number of appropriate instruments within these broad approaches is nearly boundless. Commonly utilized instruments to measure human response to the environment include interviews, surveys, focus groups, behavior mapping, and other forms of observation. Measurement of environmental attributes, such as lighting and noise levels, and self-reported emotional states (such as anxiety) are also common. Comparison of metrics routinely collected by a facility such as infection rates, rates of slippages and falls, and staff turnover in new versus existing facilities are particularly compelling. The selection of research methods is dependent not only on the research questions but also on the extent of resources (e.g., time, money, and expertise) and the willingness of the study site to engage patients or staff in the research.

An example of creating new evidence is a study conducted by GS&P, the Georgia Institute of Technology, and Tampa General Hospital. Using behavior mapping methods and focus groups, researchers demonstrated that family presence was greater in an intensive care unit designed for family-centered care when compared to a traditionally designed unit housing patients with similar acuity levels (not yet published). The family-centered unit had a distinct family zone in each patient room with a sleeper sofa, recliner, and privacy curtain. The unit offered larger, more functional public areas with beautiful views of the harbor.

Another example of original research conducted within a collaborative model is a study on the effect of different types of images on psychiatric patients in a holding room in an East Alabama hospital, conducted by AAR and Auburn University. Findings showed that simply viewing different art conditions had an impact on the anti-anxiety medication requested, which in turn had a direct implication of cost savings for the hospital (Nanda, Eisen, Zadeh, & Owen, in press). In this case, the hospital studied was not a client of AAR. Oftentimes, however, the facility under study is a client, and the researcher in practice must be careful to avoid bias toward findings that depict outcomes in a more favorable manner than is actually demonstrated. As long as the researcher maintains integrity of data collection and reporting, this sort of bias is avoidable.

Another challenge that the researcher may face is the dissemination of proprietary information. It is important to establish up front what information can and cannot be made publicly available.

Education and Outreach

Another important role of the researcher in practice is to provide education and outreach to colleagues, both internally and externally. There is seemingly no end to the number of topics for which the researcher may coordinate educational opportunities—the research process, reviews of literature, EDAC exam preparation, innovative projects, trends in healthcare, and so forth. The challenge lies in developing efficient, yet effective means of developing and delivering such a wide array of content. Internal education comes in many forms and may include one-on-one or small group informal discussions, in-house lunch-and-learn session, video- or web-based conferencing, internal publications (e.g., electronic newsletters, research summaries), and involvement with project-specific teams.

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It is vitally important that researchers in practice also share their work externally. Presenting work at conferences, like the Healthcare Design Conference or the Healthcare Facilities Symposium, is very important—not only for informing others but also for increasing the firm’s visibility as a credible source for research information. Offering learning labs or continuing medical education courses for clients provides opportunities to engage clients and interest them in conducting research at their sites. As in academia, it remains important to publish research in peer-reviewed forums. While magazine articles and white papers may have a larger circulation and greater visibility, they lack the credibility associated with peer-reviewed journals. Thus, a researcher in practice needs to develop a publication agenda spanning all the way from conference presentations to peer-reviewed publications—balancing visibility of research initiatives with credibility of research quality.

Not only does the researcher serve as a conduit between research and design, he or she is also the translator between the language of research and design and an advocate to advance a research agenda. Being able to translate technical scholarly articles into clear insights for design, and being able to translate the complex workings of design into clear research priorities, requires skill extending beyond being a solid researcher. It is a challenge to address the very fundamental bias prevalent in practice that research somehow curbs creativity. Through communication and clarification, a shared vision for innovative research and design can be advanced.

Challenges

Establishing a research arm within a design firm is no easy task. Many colleagues will have their own ideas about what “research” means . . . ideas that are far different from those of the researcher trained in a doctoral program. Being a successful researcher in practice requires much more than knowledge about research. Confidence, tenacity, creativity, ingenuity, the art of persuasion, and strong interpersonal skills are essential. Working as a researcher in a design-based practice is exciting, but this position presents some unique challenges.

Credibility is one challenge that researchers in practice may face, but this challenge can be overcome by engaging a collaborative research model. For example, research projects conducted by AAR, when possible, include a researcher from AAR, an academic collaborator, and a representative from the hospital (or research site), and sometimes a design firm. This model enables increased credibility as well as an opportunity to be tuned into the “big picture” in a rapidly changing industry. The more complex a study, the greater the need for a comprehensive team to design and implement it. A collaborative model also allows greater access to funding sources.

Funding research presents an important challenge. While most firms with a researcher on staff support this person with at least some funding from overhead, funding for necessary equipment, travel, statistical consulting, participation incentives, and support for others to work on the project are harder to come by, especially in these difficult economic times. There are few grant opportunities that address EBD concerns, and many grants are available only to not-for-profit firms. As most design firms do not fall under this category, this is another great reason to collaborate with like-minded researchers from academia and/or not-for-profit healthcare providers. This is a symbiotic process—firms can fund small-scale projects in-house by conducting pilot studies and demonstrating proof of concept for a more rigorous research study that might be proposed

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for larger grant funding. Regardless of the funding source, the best research in healthcare design will typically involve a design firm, a healthcare provider, and collaborators from academia.

Sometimes the researcher in practice may feel *isolated*. Unlike academia, research units in design firms may be relatively small, occasionally one-person units, and the idea exchange that is such a routine part of the academy is often missing. Because research in design firms is relatively new, solidarity exists across these units. Each of us is eager for collaboration. Opportunities are therefore carved out for cross-firm collaboration, although not nearly often enough. Firms that compete for projects may be wary of conducting research together; however, they seem to increasingly recognize that the benefits of collaborating outweigh the risks. For example, the 2011 Academy of Architecture for Health Foundation grant will be awarded to the Tampa Bay chapter of the Academy of Architecture for Health, which is comprised of members from competing design firms that will collaborate with the Georgia Institute of Technology to conduct a study of patient toilet room design.

The issue of *rigor versus time* is another interesting one that researchers often have to face. As a student in academia, there is oftentimes the luxury of focusing on one specific subject for a seemingly infinite period of time—delving deeper and deeper until a focused question and its subsequent answer take form. In the industry, research is often more time-bound. It may also be more tightly bound by logistics. In fact, we would claim that a modified real-estate mantra that works for researchers in practice is: Logistics, Logistics, Logistics! Here's why: To conduct research in an industry setting, in this case a healthcare facility, means that a lot of things have to fall in place. Variables to consider include availability of the site, administrative approval, human subjects (Institutional Review Board [IRB]) approval, the openness of the staff to support a research intervention, and getting all of this figured out without any hindrance to the day-to-day operation of the hospital. Research with patient or staff populations must take into account the complex workings of the hospital, overlapping schedules, and ethical considerations of possibly creating additional stress for an already vulnerable population.

Final Thoughts

Research in a design practice has a singular objective—to improve architectural practice within real-world constraints. The overarching need is to address the immediate needs of the industry, in a rigorous manner, assuring that design decisions are based on information and insight gleaned from evidence. While research is certainly committed to advancing the profession and creating a new vision, it must address the day-to-day dilemmas of practice first. Moreover, research in practice operates within the constraints of time and logistics and often needs to achieve more applied than basic research; the research program often lacks the resources needed to take a deep dive into one issue before having to refocus on to a more immediate problem that needs resolution.

Academia, on the other hand, is more likely to be committed to basic research and understanding a phenomenon beyond its more immediate application. Not only does this address the issue of vested interest and researcher bias, but it also provides the opportunity to delve further over extended periods of time into an issue. Academicians and their graduate students sometimes have the ability to continue research where firms may have had to stop. It is in academia, with curious students, experienced professors, and a wealth of information resources in-house, where research thrives in its purest form. However, the research questions addressed in academia are often delinked from architectural practice. While this has a valuable place in

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advancing theory and building a vision for the “disciplines” of interior design and architecture, research questions derived *from* practice can help advance the “profession” of design.

Collaborations between firms, healthcare providers, and universities can create a perfect nexus for research where resources can be combined to develop a feasible and affordable research plan, with returns for each sector. And, there are opportunities for EBD research outside of healthcare. For example, KieranTimberlake, an architecture firm in Philadelphia, conducts research on new architectural materials, processes, assemblies, and products.

Only a small percentage of design-based firms currently have doctoral-level researchers on staff. Ultimately, the fate of in-house research rests on their ability to add value to the firm—to spur more innovative design solutions, to increase the firm’s credibility, and to help win work. Directors of Researchers in practice don the unique role of serving as the human links between research and design, academia, and practice. Outside the Ivory Tower of academia, doctorally trained graduates get an opportunity for meaningful dialogue with the practitioners, and become part of the day-to-day strife of project completion. If they take this real-life insight, combined with their experience as a researcher, back to their academic peers and colleagues, research in practice and research in academia can be symbiotic and grow together to advance the fields of architecture and design.

References

- Center for Health Design (2008). EDAC Study Guide 1: An Introduction to Evidence-based Design, p. 3. Retrieved from http://edac.healthdesign.org/EDAC_StudyGuide1.pdf on January 2, 2011.
- Hamilton, K. (2007). Bridging design and research. *Health Environments Research and Design Journal*, 1, 29–30.
- Hathorn, K., & Nanda, U. (2008). A guide to evidence-based art. White paper for Environmental Standards Council, Center for Health Design]. Retrieved on January 2, 2011, from http://www.healthdesign.org/advocacy/adgroups/documents/Hathorn_Nanda_Mar08_001.pdf.
- Nanda, U., Eisen, S., Zadeh, R., & Owen, D. (In press). Effect of visual art on patient anxiety and agitation in a mental health facility and implications for the business case. *Journal of Psychiatric and Mental Health Nursing*.
- Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., et al. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research & Design Journal*, 1(3), 61–125.

Note

¹The evidence-based design process in healthcare is described in detail in the EDAC Study Guides 1, 2, and 3. Study Guide 1 is available for download at no cost (<http://www.healthdesign.org/edac>).

Sheila Bosch, Ph.D., LEED AP, EDAC, Director of Research, Gresham, Smith and Partners As GS&P's Director of Healthcare Research, Bosch serves as a firm-wide resource for planners and designers as they apply research evidence to enhance quality, safety, and efficiency in healthcare settings. She also contributes to this important field of EBD by conducting original research aimed at understanding how the physical environment affects health and performance outcomes. She provides internal education to GS&P employees, conducts postoccupancy evaluations, and provides learning labs for clients. An invited member of the Center for Health Design's Research Coalition, an EDAC volunteer, and an active participant in national-level research activities, Bosch is a recognized expert in the field. Bosch has more than 19 years of professional experience. Prior to arriving at GS&P, she was a research scientist at the Georgia Institute of Technology where she developed tools and resources to promote EBD among healthcare administrators and decision makers, and also conducted sustainable design and construction research. Earlier in her career, she worked as a pollution prevention specialist at Aberdeen Proving Ground, an Army installation near Baltimore, Maryland, where she developed and implemented programs for compliance with federal, state, and local requirements, primarily those regarding pollution prevention, affirmative procurement, and emergency planning. Having earned her Ph.D. in 2004 from Georgia Tech's College of Architecture, she also holds a B.S. (science education) and M.S. (life science, environmental toxicology) from the University of Tennessee. GS&P provides planning, architecture, engineering, and interior design services to national and international clients from 16 offices across the United States and in China.

Upali Nanda, Ph.D., Associate AIA, EDAC, Vice President, Director of Research, American Art Resources Nanda is the Vice President and Director of Research at American Art Resources. She has a Ph.D. from the Department of Architecture at Texas A&M University, with a certificate in Health Systems and Design. Nanda heads the research unit at American Art Resources, which focuses on the effect of art, and the visual environment, on healing, satisfaction, and productivity in the healthcare setting. Since the inception of the research unit at AAR in 2005, Nanda has developed a dozen research projects ranging from literature reviews and art preference studies to postoccupancy evaluations, behavioral observations, and clinical outcome-based studies. Patient populations studied include pediatric inpatients, adult inpatients and outpatients, psychiatric patients, long-term care patients, and oncology patients. Nanda has published her research in various peer-reviewed journals including Environment and Behavior, Health Environment Research and Design Journal and Journal of Psychiatric and Mental Health Nursing. She has presented research findings at various healthcare design conferences across the country and internationally. Research at AAR has been featured in the Research-Design Connections newsletter, the Joint Commission Environments of Care Newsletter, and the Dallas News. Nanda and her colleagues received the 2009 Center for Health Design Grant for research studying how to improve the emergency waiting room experience through art. Additionally, Nanda serves on the EDAC Advisory Board, the Editorial Board of the Health Environment Research and Design Journal, and the Research Committee for the Society of Arts in Healthcare.