

## ***Four Levels of Evidence-Based Practice***

By D. Kirk Hamilton, FAIA, FACHA

The growing trend toward evidence-based design involves design work that is informed by data from a variety of sources. It is also a natural analog to the evidence-based decision making of our clients.

An evidence-based designer makes decisions—with an informed client—based on the best available information from credible research and evaluations of projects. Critical thinking is required to draw rational inferences about design from information that seldom fits a unique situation precisely.

The process works especially well in the health-care field. It appeals to physicians, who practice based on medical evidence. It gives patients and families higher-quality experiences. It appeals to business-minded administrators by reducing costs and improving organizational effectiveness. It helps hospital boards as they seek evidence to justify costly decisions. And it benefits the public, consumer groups, and those paying the bills as they seek effective, lower-cost health care.

Indeed, a promising era of research-informed design already brightens this field. Evidence-based health-care architecture creates safe and therapeutic environments for patient care and encourages family involvement. It promotes efficient staff performance and is restorative for workers under stress. These designs ultimately should improve the organization's clinical, economic, productivity, satisfaction, and cultural measures.

Researchers have reported about the relationship between the physical environment and health care for some time. A pioneering study by Roger Ulrich in 1984 found that surgery patients with a view of nature suffered fewer complications, used less pain medication, and were discharged sooner than those with a brick-wall view. Research also shows that heart patients with strong social support systems survive longer than those lacking such support.

Studies exist about the antimicrobial characteristics of carpet fibers, lighting for neonates, effects of noise on critical-care patients, and numerous subjects affecting health-facility design. The Center for Health Design has identified more than 600 credible studies with specific environmental design relevance.

### **Practical applications**

Architects with a strong functional perspective should be comforted to know that concepts have been tested and data can inform their designs. With serious issues at stake, many architects welcome the emerging foundation on which to base important decisions. Like motherhood and apple pie, evidence-based design should be widely popular. Only the most jaded or ego-driven could object to basing design on knowledge that can help achieve predictably positive results.

Some architects worry that evidence-based methods limit creativity. This overlooks the challenge of continuously inventing responses to emerging results and new facts, requiring imaginative and ever-changing interpretations of the design implications. Research offers complex and sometimes contradictory findings, encouraging continuous testing of new ideas.

Another fear: Evidence-based design could lead to rules and limits. "Cookbook" architecture suggests dull, repetitious buildings stamped from a mold. Yet research-informed design is like the continuous search for truth in the world of science. Not static, it doesn't easily conform to fixed regulations that will be made obsolete by new findings.

Entering Harvard medical students are reportedly told, "Half of what you will learn is wrong, but we don't yet know which half." As new environmental studies are published, some decisions may be questioned, but conscientious architects will experience fewer doubts as they increase the percentage of decisions based on research. Environmental research is more likely to result in performance guidelines than in prescriptive regulation.

Numerous information sources are potentially helpful. Architects have used literature from psychology, sociology, anthropology, economics, management, engineering, industrial design, and client-related sources. The Internet, press, industry data, conferences, and exemplary facilities are also good resources.

Architects are rarely taught research methods, and most believe they lack the training to fully understand, much less perform, serious research. The promise of high-quality projects demonstrating measurably better results is the "marketplace carrot" to differentiate research-informed architects for clients seeking higher performance from costly projects. This powerful means to convince decision makers to invest time and money to "build it right" can be a competitive advantage for both.

## **A conceptual model**

To differentiate evidence-based types of practice, the model below illustrates four ways of dealing with research. The model identifies four increasingly rigorous levels of commitment and methods of using research on behalf of clients.

**Level 1 practitioners.** These architects make a careful effort to design based on available evidence. By staying current with literature in the field, they attempt to follow the evolving environmental research related to the physical setting. They interpret the meaning of the evidence as it relates to their projects and make judgments about the best design for specific circumstances. An example is the use of design concepts based on benchmark reviews of other projects and interpretations of published research. Most architects work at Level 1, producing work that advances the state of the art by developing tangible examples while delivering improved design.

**Level 2 practitioners.** These architects take the next important step. Based on readings, they hypothesize the expected outcomes of design decisions and subsequently measure the results. These less subjective designs require new design methods. Architects must understand the research, interpret the implications, and build a chain of logic connecting the decision to a measurable outcome, reducing arbitrary decisions. The potential for bias in gathering and reporting results means they must resist the temptation to report success and downplay failure.

**Level 3 practitioners.** In addition to following the literature, hypothesizing intended outcomes of design, and measuring results, these architects report their results publicly. Writing or speaking about results moves information beyond the firm or client team. It subjects methods and results to scrutiny from others who may or may not agree with the findings. Level 3 practitioners must understand research methods and may seek advanced education to enable greater rigor.

**Level 4 practitioners.** Scholar-practitioners perform the same tasks: following the literature, hypothesizing outcomes of design decisions, measuring results, and reporting. These architects go further by publishing their findings in peer-reviewed journals or collaborating with academic social scientists. They subject their work to the highest level of rigorous review.

## **It isn't easy**

The dark side of this trend is the appearance of practitioners who would like to be associated with evidence-based design but who haven't done the hard work to become current. Given the almost endless potential sources of information, there is a need to reach speculative conclusions about the design implications of narrow studies. The architect's role is crucial in translating and applying the research to useful designs. Inexperienced practitioners will find it difficult to make the leap from data to a successful design. Vast numbers of confounding variables in any setting make single-minded solutions suspect.

An architect has an obligation as a sacred public trust, granted with licensure, to use the most reliable information available. As in the story of Pandora's box, which, once opened, could not be closed, an architect cannot avoid the moral responsibility for what he or she knows after encountering compelling evidence. Using research findings to improve design decisions comes naturally for many architects. Adding rigor to what we already do is fundamental to this shift to evidence-based practice. The clear business case for good design—and an even stronger case for design linked to positive performance and economic results—suggests that the trend is here to stay.

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