

Evidence-based Design, A Gap Analysis: Minimizing the Distance between Design, Strategy, and Outcomes

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“It’s all about increasing market share,” a Senior Vice President of strategic planning and development of a large health facility said to me. We had just completed staff, patient, and visitor experience interviews and surveys.



Entrance façade. PinnacleHealth, Harrisburg, PA. Francis Cauffman; Rachel Calemmo, LC LEED® AP. (©2010 Halkin Architectural Photography, LLC)

For decades healthcare facilities have increased capabilities and improved amenities to compete and win in an ever more crowded and competitive marketplace. During the 1980s, hospitals added physicians offering specialized practices; in the 90s innovative technology gave a competitive edge; and increasingly, since 2000, healthcare management looks to facility design to improve overall outcome; including building performance, user satisfaction, and market and financial advantage. To that end, executives seek data, predictive analytics, and measurable results to support recommendations and sustain business. This is called “evidence-based design” (EBD).

Healthcare management is not the only group seeking this information. Entrepreneurs of Philadelphia’s commercial corridor also want statistical data that show “good design makes good business.”

Designers are hearing the message, and responding. However, an analysis of the [***Second Annual Research Report 2010 Survey of Design Research in Healthcare Settings: The Use and Impact of Evidence-Based Design***](#) gives insight into the challenges that the design community faces in adopting EBD. The report analyzed responses of 1,000 people (78% US, 22% international) who took time to share information about their beliefs, thoughts, and behaviors.

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The Knowledge Gaps:

Practice Gap

Like healthcare, EBD depends on teams of specialists assembled to contribute their varied expertise to projects. However, the survey sample population revealed a lack of design specialists, producing a gap between teams' actual knowledge and their expected capabilities. Fewer than two percent of respondents were **environmental graphic designers** and **landscape architects**, and not one **lighting certified designer** responded to the survey. The lack of specialized knowledge could account for more than two thirds of the respondents (69%), when asked to identify barriers to conducting research about project features, citing consistency in team members as the problem.

EBD guiding principles for healthcare facilities call for "patient and family centered environments" and "decreased stress." Achieved in part by improved wayfinding, increased access to nature (such as healing gardens, atriums, courtyards, and terraces), and positive work environments with adequate and appropriate light exposure, these features are best designed by specialists.



Nurses station. PinnacleHealth, Harrisburg, PA. Francis Cauffman; Rachel Calemno, LC LEED® AP.
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This gap in expertise impacts facility design. For example, fewer than half of the respondents (48%) always plan or use integrated wayfinding, and only one third of them (33%) always plan or include natural elements, such as gardens, for use by staff, patients, and visitors.

In spite of **data supporting** the positive impact of natural lighting on employee performance, only slightly more than one third of buildings (37%) always include plans for it in staff areas. And fewer than half of all patient rooms (44%) have views to nature, although there is good **evidence** that views of nature contribute to healing and well being. Likewise, fewer than half of healthcare facilities (41%) include patient or family controlled lighting throughout.

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Overall, fewer than half of the surveyed facilities always include EBD features. Extrapolated to America's more than **16,000 hospitals**, the data suggest that only 7,860 facilities always include wayfinding, only 5920 always include natural light in staff areas, and only 5,280 facilities always include gardens accessible to staff, patients, and visitors.

While there are indications of movement toward improved healthcare design, additional effort is required to align team capabilities with market expectations. The gap can be minimized by including more specialized expertise, which yield more consistent project outcomes and improved business results.



Garden of Tranquility. Duke Clinic; Seese-Thornton. (DukeHealth.org)



The Labyrinth. Duke Integrative Medicine. John Vargas. (DukeHealth.org)

Research Gap

“People say they do it, but they don’t” was an option selected by more than half of the respondents (58%) when asked for their personal opinion of EBD. They might be right.

Nearly three-quarters of those surveyed (71%) indicated they use the term “Evidence-based Design,” yet nearly half of those surveyed identified insufficient understanding of the research process and insufficient understanding of research language as problems (49% and 42% respectively) (Figure 4).

The result is a gap in key locations of the process. Three quarters (75%) indicate that sufficient time required for research is lacking. Only half of the respondents involve researchers during the planning (51%), concept

development (48%), and post-occupancy (46%) phases of their projects. While two-thirds respond that they always generate ideas in which design will improve outcome, fewer than half (44%) always set measurable goals, and an even smaller percentage (24%) use specific performance measures to quantify the outcomes.

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Survey results suggest a possible cause: lack of researchers in the design community. The fact that only eight percent of the sample population was researchers, of whom fewer than five percent engage in applied research, could explain why nearly two-third of respondents (64%) reported an inability to find qualified researchers.

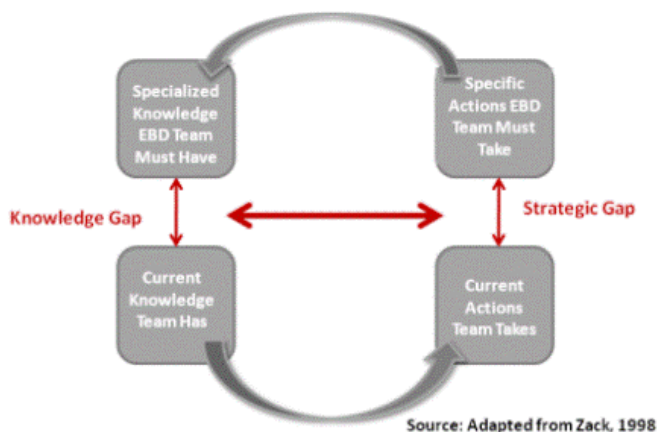
Including qualified researchers on the team, and throughout the project, can minimize the gap between the current knowledge the project teams possess and the knowledge they need to understand the problems they face. Research requires skill to identify, collect, and synthesize information from varied sources, and critical analysis takes time to identify problems, trends, and opportunities.

Done properly, research provides designers and their clients with the knowledge and insight needed to make decisions and take actions to improve outcomes and compete in the present market.

The Strategic Gaps: Measurement Gap

Measuring performance provides data that can improve outcomes and sustain competitive advantage. Respondents, many of whom are architects and interior designers having more than 15 years of healthcare design experience (24%, 16% and 16%, 9% respectively), indicate that design evaluation includes reviewing past projects, studying past and current research for various design features, and touring and bench-marking facilities (88%, 84%, and 83% respectively.) Over a quarter (27%) indicated that projects are never formally evaluated. However, evaluation is not the same as measurement, and the difference between the subjective and objective is contributing to the strategic gap.

While nearly three quarters (72%) indicate they conduct post-occupancy studies to measure results, only some (17%) reference these studies during the information gathering phase. The use of other measurement tools is dramatically low: before-after analysis (43%), focus groups (34%), and natural experiment (17%). Nearly one quarter (22%) measure results, but admit that they are uncertain about the methodology.



The Knowledge Gap. (Adapted from Zack, 1998)

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While reviews and post-occupancy studies are important, additional studies must be conducted to gather quantitative data. Designers who implement systematic, objective, quantitative research methods for surveying, measuring, analyzing, and reporting will advance EBD; resulting in improved decisions and outcomes for design firms, clients, and facility users.

Resource Gap

Time and money are vital resources; and different attitudes toward them create gaps between designers and clients. In this, EBD is no different from other aspects of the design process. Survey results reveal misaligned perceptions. For instance, nearly a quarter of the designer team members (24%) indicate that allotting sufficient time is usually the biggest problem with achieving EBD, while only 12 percent of the client team shares this belief. And, while 15 percent of the designer team believes the commitment of the owner is the biggest problem, unsurprisingly, a mere 4 percent of the client team believes the same.

Closing this gap depends on understanding each other's capabilities and expectations. Designing high performing buildings requires both sufficient time and the commitment to develop high performing teams. Successful EBD requires time to deliver economic value and market advantage.

Conclusion

Organizations across many industry sectors increasingly use predictive analytics, based on real data, to create sustainable businesses and increased market share. Evidence-based Design provides a framework that links design, business strategy, and outcomes. The broader and faster adoption of EBD, not only in healthcare but all sectors, depends on closing the knowledge and strategy gaps. Achieving that, design firms and their clients will gain competitive advantages, and benefits will be realized by all who use the spaces that they create.

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