History of evidence based design

What is evidence based design?

Traditionally associated with healthcare architecture, Evidence Based Design (EBD) is making inroads into being part of the process for designing schools, office spaces, hotels, restaurants, museums, prisons and even residences \(^1\).

EBD is a term that is starting to be used regularly in architectural fields. According to Hamilton and Watkins definition “EBD is a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project” \(^2\). In simple terms this means the thoughtful use of the best available knowledge to improve design decisions \(^2\). Architects have always designed using the best available evidence from engineering and material science, physics, statistics, geometry and many other fields founded on sound data \(^2\), the difference with EBD is the increasing use of evidence from disciplines outside of the traditional architectural arena such as research on how health is effected by the built environment published in medical journals for example.

EBD – beginnings in healthcare

EBD is strongly associated with healthcare because of the existing evidence-based medicine culture \(^3\). It makes sense that EBD has its roots in healthcare, where lives are at stake and legal implications are palpable, and decisions need to be justified by hard data \(^1\).

The movement towards EBD in healthcare can be traced back to Roger Ulrich with a pioneering study conducted in 1984 \(^3, 4\). Ulrich compared the positive effect of views of natural scenery (trees) on the recovery of patients from surgery to patients in similar conditions who were exposed to a view of a brick wall. Ulrich showed that in comparison with the wall-view group, the patients with the tree-view had shorter post-operative hospital stays, had fewer negative evaluative comments from nurses, took less medication, and had slightly lower scores for minor post-surgical complications \(^3, 4\). Since then, the impact of the physical environment of the hospital on the wellbeing and health of the patient has received extensive academic attention \(^4\). Consequently, this resulted in a creation of spaces considered to be ‘healing environments’. An increasing body of knowledge on evidence-based healthcare design has become available, and the amount of information has grown rapidly in recent years \(^4\) with several hundred papers published relating to healthcare alone.
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Healing environments

It has long been known that the physical environment of a healthcare facility can affect patients and staff (5). In the late 19th century, from her experiences ministering to the wounded in the Crimean War, Florence Nightingale strongly advised the British government that the convalescence of patients would be hastened if hospitals were built to afford them fresh air, sunlight, calm & quiet, and views of nature (6). However, over 100 years later, healthcare facilities are often considered starkly institutional, unacceptably stressful, and unsuited to the emotional needs of patients, their families, and health care personnel (5, 7, 8).

The positive effects of space and the environment were well known in the era before science (9). For many centuries in ancient Greece, temples to the God Asklepios, such as the one at Epidaurus, were designed to surround patients with nature, music and art to restore harmony and promote healing (9). In the Middle Ages, medical care was closely associated with the religious institutions of the time. The design of monastic infirmaries contained many elements to promote the spiritual healing process and were deliberately located adjacent to a central courtyard or garden so that patients could contemplate the scenery. This courtyard was usually designed to symbolise the Garden of Eden referred to in Genesis of the Bible (10).

In the late 1970s, more and more people, in particular patients and nurses, became dissatisfied with the sterile and user-unfriendly design and organisation of the hospitals of that period (10, 11). One patient, Angelica Thieriot, went through such a traumatic hospital experience in the U.S that she took the initiative to found Planetree, a non-profit organisation that strives for the transformation of healthcare settings into healing environments. This new approach has been highly successful. By 2005, more than 70 healthcare facilities in the U.S had been redesigned and reorganised according to the Planetree model. With respect to facility design, the model dictates that buildings should include efficient layouts that support the user’s needs and create home-like spaces. The design should also foster a connection with nature such as through healing gardens and fountains. Auditory needs are also attended to, understanding that gentle sounds rather than loud noises may help people to remain calm and feel in control (10).

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EBD in other building types

More recently EBD has started to be used as part of the process for designing schools, office, hotels, restaurants, retail developments and many other types of project. By considering outcomes such as occupant’s health, wellbeing and productivity, a well designed building can have major benefits to those who live, work, visit, or learn within it.

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For businesses, staff costs typically account for about 90% of business operating costs (12). Therefore even small improvements in employee health or productivity related to office environments can have a huge financial implication for employers (12). This could be through factors such as improving indoor air quality or reducing distracting noise (e.g. by using noise-reducing finishes such as high-performance sound absorbing ceiling tiles).
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In schools students in classrooms with large windows perform better in tests compared to rooms with little natural light \(^1\). Research has also shown that noise has detrimental effects upon children’s performance at school, including reduced memory and reading ability \(^13\).

Away from schools, corporations have spent significant funds compiling data about the science of shopping. For example, men prefer shops with metals and dark woods. Mall pedestrians tend to walk on the right-hand side. Food shoppers spend more money when the store’s circulation is clockwise \(^1\). In prisons studies have been carried out on cell size, colour and texture, and the connection of those qualities to inmate depression and violent behaviour — useful data to have when designing a facility. In museums, observations have shown that 70 - 80 percent of visitors turn to the right when entering a gallery \(^1\).

There is also a clear connection between sustainable design and the need to collect evidence. Due to the environmental agenda there is a rapidly growing body of performance data on mechanical systems, lighting, building orientation, water & energy usage, and indoor air quality \(^1\). There is no single area of architecture that would not benefit from this kind of knowledge and information, substantiated research using EBD principles can help all designers make better informed decisions \(^1\).
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References

(1) Whitemyer D. The Future of Evidence-Based Design. It's not just for healthcare anymore. 2010
(13) Shield B M, Dockrell, The effects of environmental and classroom noise on the academic attainment of primary school children. 2008