Research Design and Data Collection Techniques in Investigating People-environment Behaviour

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Abstract. This paper explains the research design and methodology for a study conducted on alterations made by people lived in urban houses in Malaysia. It begins with a brief review of literature on research approaches and methodology related to the study of the interaction between people and the environment, highlighting the area known as environment-behaviour (E-B) research. The literature had suggested that techniques of gathering data for studies on behaviour should be non-obtrusive in approach. Therefore, the generic questionnaire technique, for instance is not particularly appropriate. The review also found that many E-B studies have employed observational technique for data collection quite extensively. Some related works recently undertaken are briefly described in this paper. The floor plans analysis technique is another option which had been used to investigate behavioural phenomena. This relatively simple technique, by far, had not seemed to be taken further. The work reported in this paper has employed this technique as the main approach with notable success. The concluding part of the paper recommends that such a technique should be given due consideration by researchers of the built environment.

Keywords: research design, environment-behaviour, content analysis, floor plan analysis

Introduction

What changes did people do in the houses they had modified? This was the prime question at the beginning of the research reported in this paper. The main methodology employed in the investigation was to analyse the pattern of changes that were carried out by house-owners on their houses. A detailed examination of modifications and alterations based on a sample consisting of house plans was carried out. From the outset, it was determined by analysing such patterns, it would be possible to interpret the motivations and intentions of the occupants in modifying their houses, a common occurrence in housing areas. Hence, people’s actions towards achieving satisfaction to their personal living environment would be revealed. Such information is useful in designing more satisfactory living environments for people particularly in speculative projects.

Research orientations in the built-environments

Research of the built-environment is fundamentally aimed at improving our understanding of the experience of the user in their environments. Clearly, it is people (i.e. building users) that are the subjects of study. Aptly, such studies are often regarded as “user-centred” research. There are various terms which are affiliated to such studies including what are commonly known as “user-need”, “user-satisfaction” and “user-action” studies.

1. User-need study
The “user-need” study is essentially an inquiry on the needs and requirements of the occupiers or those who will use the proposed building.
The outcome of such studies will be useful guides for the architects and designers prior to designing (Fawcett 1995, Kernohan et al 1992, Gutman 1966). Most often the design brief provided by the clients is insufficient; this necessitates the designer conducting investigations for further information and to formulate more complete briefing documents.

The study can be carried out through precedents e.g. visiting and studying buildings of similar function or type, and/or consulting the would-be occupants and users. Aspects of study include the examination of the spatial requirements, organisation, adequacy of spaces, and environmental comfort (Voordt et al 1997, Darke 1984).

2. User-satisfaction study
The “user-satisfaction” study is an important tool for researchers and design professionals alike, enabling them to respond to the growing expectations and demands of users (e.g. Wong & Yap 2003, Galha 2000). Most commonly described as post-occupancy evaluation studies (POEs), these are carried out by gathering data that elicit the views and opinions of people who occupy or use the building. This type of study assesses the efficiency of the building, in which the outcome will be used as a guide for improvement in future projects of a similar nature. Similarly, building owners or organizations may be interested in assessing the level of satisfaction of its staff, so that remedial action can be taken, if necessary, in order to increase their productivity.

Different operational techniques can be employed in this type of study but an observational approach has gained dominance in recent years. One of the major features of this approach is that subjects are discrete and unobtrusive. However, interpreting by abstracting from actions requires skills that can be a problem due to subjectivity (Groat & Wang 2002, Canter 1974, Sommer 1972).

Methodological considerations
There are a vast number of approaches and techniques which can be employed in conducting a study and the choice depends primarily on the subject of investigation. In the field of the built environment it is largely the quality of the environment that has become a central issue and concern. It is a form of assessment to evaluate whether the built environment achieves the expectations of the users. Hence, people and the built-environment become the objects of investigation. It is common that people’s behaviour in built-environment settings are observed and analysed.

Indeed, such an approach has flourished in the late 1970’s (Bechtel 1977) and is commonly known as Environment-Behaviour (E-B) study which is later known as Environmental Psychology (Abbas 2000). According to Ziesel (1984), “environment refers to the physical, administrative and social attributes of settings in which people live and play. Whereas
behaviour refers to “things people do”, including thinking, feeling and seeing as well as talking with others and moving around” (Ziesel 1984 p. xi). How does E-B study differ from the other studies?

An E-B study can be identified simply as an approach of study that analyses people’s behaviour in the built-environment. Its broad aim is to gain understanding of how people behave, react and interact with the built-environment. By so doing, it would be possible to design rooms, spaces or buildings that are more related to the people (i.e. users).

1. Examples of recent E-B studies

Quite recently a study was completed by Atmodiwirjo (2005), which examined the behaviour of adolescents at bus stops in the city of Jakarta, Indonesia. The study principally employed the observation approach. The main underlying theory of the study explores and extends the concept of “affordances” which broadly means a process in the interaction between people and the environment (p. 71). The study concluded that there are multiple affordances at bus stops. The study is important in understanding the behaviour of users of bus stops, and can, therefore, be useful in designing more suitable bus stop environments.

Methods and techniques for data collection

There are several methods that can be employed in gathering data and it mainly depends on the subject under investigation. Methods of collecting the data from these various sources would depend on the subject and context of the study. The following briefly introduces the techniques of information gathering in the E-B studies commonly applied by researchers in the study of the built environment. They are: personal interview, questionnaire survey, observation and participation (see Voordt et al 1997).

Personal interview

It can be argued that people’s opinions, views and feelings about the environment can best be obtained if they are directly. They can be approached directly through a personal interview in which the researcher asks either structured or free questions. The length of the interview can vary, depending on the subject and purpose of the inquiry (Groat & Wang 2002). For example, quite recently Bryan Lawson has successfully interviewed eleven well-known architects in his attempt to discover how the design process took place in these offices (Lawson 1994).

The questionnaire survey

People can also be requested to fill in a questionnaire, requiring them to respond to the various questions related to the study being conducted. Questionnaires have to be carefully structured in order to encourage participation as well as obtaining accurate information. The questionnaire can be handed directly to the participants or by post. Nowadays, with the advent of the internet, it is common to send questionnaires electronically (e.g. e-mails or websites).

Observation

One technique used by researchers to gain information about subjects is to simply observe them their natural setting. As such, the main feature of this technique is to minimise or eliminate obtrusion into the behaviour of the subjects, which might otherwise be “altered” if the subjects were “interrogated” by the researcher. For instance, to study animals in the jungle, the researcher’s presence could result in interference with the animals’ natural habits or behaviour. Thus, the data would not accurately reflect the animals’ natural behaviour. The use of videotape has become commonplace to provide a recording of the events observed in the study.

A similar situation applies when studying people in the street, or in other public spaces (e.g. Ziesel 1984, Canter 1974, and Sommer 1974). People's behaviour in public spaces,
such as waiting areas in health centres, airports, parks, bus stops, etc., has been investigated using this approach (Abbas 2000, Canter 1974, Sommer 1972). Due to the apparent advantages, this technique is becoming one that is more frequently used in E-B studies.

Participation by the researcher
Researchers may also collect information by participating in the real-life setting, as if s/he is one of the subjects. The researcher is embedded within the setting for a certain period of time and makes a record of the activities taking place. The researcher gathers the data by observing and recording the activities taking place. Examples of studies that have been applied to this approach include investigations of activities in Thai houses made by Piyalada 2000 (cited in Groat & Wang (2002). Another was a study conducted by Dana Cuff (1991) who made systematic observation on people in an architectural firm for a relatively long period of time.

3. Choice of method for people-environment behaviour
As mentioned at the beginning of this paper, the investigation was set to find out what people tend to alter in the event of modification. This was a matter of curiosity initiated by spontaneous observations that seemed to indicate regular modification occurrences in any normal housing estates. One of the hypotheses that can be made was that the houses built did not match the expectations of the residents. Do residents have “other ideas” that are not reflected in the houses actually built for them? Or is this a manifestation of the idea that people cannot avoid transforming their “houses” into “homes”? These are the primary aspects this study attempts to discover.

From the brief review of methods described here, it is appears that are available options for the investigation. To answer the questions raised, perhaps it would be logical to ask the house-owners themselves. They can be interviewed and asked to show off their dwellings while the researcher takes notes and photographs for further observation and analysis (e.g. Cooper-Marcus & Sarkissian 1986, Cooper-Marcus 1995).

However, these are not the only techniques available. In this regard, Sommer (1972) contended that asking people may not be necessarily relevant in providing the data. Moreover, it is a known fact that people do not always speak frankly what is in their mind (Krabbendam 2000). There may also be certain “side effects” in the data caused by asking people about their intentions (Ziesel 1984). For this reason, alternative option could

More recently West & Emmit (2004) have analysed a sample of speculative house plans in their study to explore the rooms provided by developers. They made a detailed study of house plans obtained in sales brochures that were produced by speculative developers. In the study of crime in residential areas, Newman (1972) used floor plans extensively and the outcome of his study was published in a well-known book entitled Defensible Space. Lawrence (1987a) has showed how applicable the use of building plans in formulating the typology of urban dwellings. It is also common practice that plans are evaluated before buildings are built. For example, architectural students are evaluated on the basis of the projects they have done in their respective schools, which are most commonly presented in the form of drawings of buildings that have not yet been built.

Comparison with the content analysis approach
From the literature, the approach taken in the present study may be categorised as what is usually termed as “content analysis” (CA). Hannagan (1986) describes the CA approach as “a method of producing information by analyzing the content of written documents”.
More succinctly, Bryman (2001) defines the CA as “an approach to the analysis of documents and texts that seeks to quantify content in terms of predetermined categories and in a systematic and replicable manner” (p. 180).

Bryman also describes data that comes from such documents as “out there” waiting to be assembled and analysed. This is one form of what Bell (1993) terms as an “inadvertent” data source. The description of CA by Sommer & Sommer (1980) is perhaps even more relevant. To them CA is “a systematic tabulation” that is made so that “trends can be identified”. As mentioned previously, Ziesel (1984) and Bryman (2001 p. 89) described this as recording “physical traces”.

The advantage of using this kind of data is that it was created for its own purpose and not specifically for the research, thus avoiding a syndrome that Bryman describes as the “reactive effect”. As such, it is one form of “unobtrusive” measure. In reference to the present study, these documents, in the form of drawings, are obtained from the various authorities and prepared for the purpose of getting

Conclusion
This paper has discussed the various methods of research related to the built environment. Based on a brief review of previous work, there are various options and approaches that may be employed to conduct this kind study. People can be asked questions or interviewed and open their dwellings to the researcher, who can take notes and photographs for further observation and analysis. However, as believed by many, this approach may not be appropriate in all situations. This is because people may not always able to reveal what they have in mind freely. Neither should “side-effects” caused by the very act of asking them about their intentions be ruled out.

Alternatively, what people do often reflects their intentions and objectives, so observing the changes they have made to their environments may reveal their expectations. Perhaps for these reasons, it was found that building plans were worthy subjects for intensive study and used extensively in quite a number of studies.

References: