

POST OCCUPANCY EVALUATION PROGRAMME (or POE): An assessment method for buildings efficiency

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Résumé

Post Occupancy Evaluation (ou P.O.E) est un concept inhérent à l'Evaluation de l'Espace Vécu. Confirmé à ses débuts dans les pays anglo-saxons il est de plus en plus adopté en Europe Continentale notamment la France sous le vocable 'Analyse Post Occupationnelle'. En fait, le procédé englobe une série de méthodes [1;2] qui consistent à évaluer objectivement ou subjectivement un environnement (intérieur ou extérieur) après qu'il soit mis au service des usagers. Evaluer la performance effective d'un espace, permet de vérifier autant que possible et en ayant recours à des bases scientifiques, ses éventuels déficiences et encore mieux d'éviter des erreurs similaires dans les projets futurs. L'objectif de cet article est de présenter une démarche et un canevas du procédé d'un programme de l'Evaluation de L'Espace Vécu et ce à travers certains problèmes inhérents à la conception et à l'utilisation des centres de sports à Constantine (Algérie). Il y est aussi suggéré des directives à propos des méthodes offrant éventuellement la possibilité d'esquisser des solutions

Mots clés: Evaluation, Poste-occupation, satisfaction, performance, efficience, efficacité, sport et centres de loisirs.

Abstract

Post Occupancy Evaluation (or POE) is one concept that first developed in North European countries. Later it becomes widely adopted by building researchers in Continental Europe (expressly in France) under the expression of 'Evaluation Post-Occupationnelle'. In fact, this concept consists in a series of methods [1;2] that allow to evaluate both objectively and/or subjectively mostly occupied buildings to check upon the extent of their performance. Assessing building (both indoor and outdoor) environment allows checking the effective efficiency of the design, to correct as much as possible any deficiency, and most important avoid similar mistakes in future buildings. This paper intention is to provide a useful guidance and framework for the process of one Post Occupancy Evaluation (POE) program throughout the main problems of design and use of existing sports centres in Constantine (Algeria). It also suggests ways in which operational research could help find possible solutions.

Keywords: Evaluation, post occupation, satisfaction, performances, efficiency, efficacy, sport and leisure centres.

ملخص

ان مفهوم تقييم الفضاءات المستعملة – تقييم بعد استعمال - كانت له اهمية معتبرة على المنشآت المعمارية , فى الواقع أن المنهج يتطلب التقييم بصفة مستمرة ومتوالية للمحيط –داخلي وخارجي – بعد ان يوضع فى الخدمة من طرف المستعملين. تقييم النجاعة الفعلية للفضاء يسمح بتحقيق مايتوافق والقعد العلمية, والنقائص الناتجة وذلك لتفادي الأخطاء المماثلة فى المشاريع المستقبلية .
تقييم- بعد استعمال-النجاعة- الفعلية المشاريع المستقبلية .

Although Post Occupancy Evaluation appears to be a relatively new term in architecture, it is one concept that has already had a significant influence upon building design. In fact, in most developed countries there is a widespread of studies commonly stating that “**Post Occupancy Evaluation (POE) is the method through which better buildings can be designed**” [3 For instance, in a search work related to architectural studies, Hiller and Al. [4], pointed clearly to the necessity for POE as an area of research priority. They also confirmed that POE is the

KORICHI Amar
ROUAG-SAFFIDINE
D.SAHNOUNE Tayeb
Département d'Architecture &
d'Urbanisme
Faculté des Sciences de La Terre
Université Mentouri de Constantine

primary method through which better buildings can be designed. Rabinowitz and Al. [5] in their turn, claim that the **POE** is a process of evaluating buildings in a systematic manner after they have been built and occupied for some time with in mind performance criteria.

This process of measurement, comparison and interpretation should normally influence the planning and design of new buildings through its impact upon briefing and building guidance and consequently improve the functioning of existing buildings. Actually, evaluation is essential in order that successful features can be identified and repeated, unsuccessful features can be eliminated and lessons can be learned from past mistakes and forms a sound basis to improve existing designs and to feedback for creating better buildings in the future.

Post Occupancy Evaluation pays also a particular interest to building occupants and their needs and thus provides insights into the consequences of past design decisions and the resulting building performance [6]. In addition, according to the Social Services Buildings Research Team [7], evaluation process should include two concepts, one related to a comparison of measurements against criteria, and the second to the choice between alternatives solutions assessed again against criteria. This need has been expressed not only by architects and academics, but also by client organisations, government departments, and local authorities who want to know what they are precisely getting for there money.

Actually, this paper intention is to essentially provide a useful broad guidance and framework for the process of one Post Occupancy Evaluation (POE) program. For a better understanding of this latest, existing sport centres in Constantine (Algeria) are retained as space model. Their main design and use are examined and ways in which operational research could help find possible solutions are suggested.

1. IDENTIFICATION OF THE PROBLEM

There is a growing and recognised demand for sports and recreation activities, from old established outdoor activities such as fishing, swimming, tennis, football, to typified

indoor sports activities such as badminton, five side football, handball, volleyball, gymnastics, squash, trampoline...The reasons for the boom seems to be related to the growing urbanised population with more money, more mobility, and more free time to spend on sports and leisure activities than previous generations. But the ways in which demand for particular sports and leisure activities is actually shaped with a desire for relaxation, excitement, exercise and for company and how it relates to supply is complex and only partly understood and requires most careful planning so to help predict in a coherent manner for people growing demand in the future.

One solution being adopted by authorities and governing bodies is to built multi-purpose sports centres. Their advantage is that they offer opportunities for the greatest possible use by providing a wide choice of sports and recreation facilities. Nevertheless, because of their multi-activity use, sports and leisure centres present effective problems of planning, design and use [8].

In Algeria for instance, a large programme to provide new sports and recreation centres has been introduced and over a hundred new centres have been built in the last decade and several hundred are actually planned throughout the whole country. Yet this programme is based on the very limited information and guidance of design of different sports and leisure facilities contained in the guide lines issued by the Ministry of Youth and Sports. These kind of regulations concern partly space use and occupancy, design characteristics of different sports and leisure activities, layout and space relationships, size and shape of individual space, flexibility for change and growth, and maintenance and security of the centre. Hence, despite this lack of information new buildings have been built and others are now under construction.

In a preceding search work [9], it was found that a great number of the problems experienced by sports buildings in Algeria as probably many other developing countries, were associated with the lack of the evaluation studies. This has resulted in a general lack of feedback into design process. Therefore, it appeared clear that evaluation of existing

sports centres is one first priority before designing future buildings otherwise there will be centres most likely not matching users requirements and far from providing appropriate environments for the range of sports to take place. Therefore it is suggested that an evaluation programme should be established to provide feedback to be used in the design of sports and leisure centres in Algeria in order to:

- Ensure that problems identified in the existing sports centres are not repeated in the design of future centres.
- Make sure that future centres will incorporate good features which have proved to be effective in facilitating the efficient organisation and use of the centres.

2. RESEARCH PROGRAMME

In setting up any research programme, it is suggested to bear in mind three important factors which are:

- Identification of methods of evaluation which could be applicable for the research programme.
- Definition of criteria and standards for evaluation.
- Definition of the scale of the evaluation programme.

2.1. Methods of evaluation

Most post occupancy evaluation studies have utilised a wide variety of tested methods that include in general measurements, observation, interviews and questionnaires, all which have a reasonable degree of validity, and are in general appropriate for use to evaluate buildings.

The choice of suitable methods, taken individually or combined, seems to be dependent on the particularity of problems studied, the specificity of situations encountered and the purpose of the evaluation study [5,10].

2.1.1- Photography

Whatever the level of post occupancy evaluation (POE) is employed, photography will play a key role. A photographic record of certain building conditions and activities will allow for examination after on-site work is completed. Photography can be used directly to collect data or to complement other methods. It can also be considered as a primary method for the collection of data on functional elements of performance, such as handicapped access, storage, flexibility, equipment usage and furnishings.

In using photography to collect data on functional elements of performance, particular care must be taken to identify each photographic frame on site, by location, orientation, date and time, descriptive data, notes on the subject matter.

2.1.2- The use of videotape

‘Videotaping as a surveying method is one issue that would allow the gathering of maximum information in the shortest-time possible. It might be used alone or with combination to other methods; such as direct observation. Yet, its application necessitates to set a clear programme of action of which the first step consists of making an inventory of the variable suitable equipment and of taking permission from the appropriate authorities and persons to observe’ [11].

2.1.3- Observation methods

The observation method can be used at three different levels and for three different purposes. The use of the method as a tool to identify environmental problems for further investigation and develop hypothesis to be tested by observing physical features and behaviour within a specific environment. In more simple words, such a method helps establish the problem already identified and enables the researcher to plan his work systematically and may be adopted as one research project method that allows gathering of necessary data for analysis and solving particular problems. In this case, the method requires usually to be carried out in a formal and systematic way using planned schedules with check-list items to guide the researcher to gain time. Observational methods may be classified as either direct- observer based assessment, or indirect-technical based assessment [12].

i- Direct observations

Refer to live recording of individuals’ responses and reactions by an observer often present in the place of investigation [11].

ii- Indirect observations

Require mechanical monitoring equipment to register a retrospective reading of facts and effects. This equipment for data recording is necessary. The potential advantage of observational methods is that they reveal the real actions of

people under particular circumstances.

2.1.4- Interviews

The use of the interview method is often seen a complementary strategy to observation to increase the consistency and reliability of the information gained through observed events and behaviour. Further, they can be used as a research method to collect data in a structured and a systematic way for analysis and drawing up of results.

2.1.5- Questionnaires

Although the methods of observation and interview are the usual means for generating hypothesis about particular problems of interest and collecting data for analysis to test and refine these, the use of questionnaire enables the collection of data for a final analysis from which results of the research can be drawn. The questionnaire resembles a structured interview, as they both require a schedule which is designed in much the same way.

The main difference is that instead of the questions being asked by an interviewer who will record the answers by any relevant technique, they are designed to be read and filled in by the respondent.

2.2- Criteria for evaluation

In setting up the proposed evaluation programme, it is necessary to consider the criteria against which sports centres being studied can be assessed.

From literature review, it is suggested that, because of the international character of sports and recreation activities, it is possible to transfer space standards and design recommendations for sports from one country to another, but how they would be combined there would vary depending on a number of factors such as the climate, organisational considerations and cultural differences in terms of type of sports played in each country. Nevertheless, at a first stage of the evaluation programme, it is necessary to explore what design criteria exist before starting the research programme. According to Rawlison [13], these measurement criteria can take various forms:

2.2.1- Implicit criteria

Implicit criteria are used by professionals in the field to form their own assessment of a building. The validity and

reliability of such criteria is dependant upon the professional's own judgement. It is difficult for others to replicate such assessments and even for the expert to apply his own criteria consistently across varying situations.

2.2.2- Explicit criteria

These criteria are stated in advance. This means that their validity and reliability can be properly tested and they can be applied more consistently to a variety of buildings, thus increasing the possibility of comparative evaluation.

2.2.3- Empirical criteria

These are explicit criteria derived from previous or current practice. They have the advantage that information with which to produce such criteria may be readily available but the disadvantage that they may merely reflect historical inadequacies of building provision of current patterns of facility use.

2.2.4- Normative criteria

These are criteria derived usually upon the basis of expert judgement which are intended to describe good practice. However, whether these criteria are commonly explicit, the assumptions upon which they are based, are often implicit which makes it difficult to alter them to suit changing patterns of different facilities.

The same author (i.e. Rawlison [13]) suggests the following list which provides examples of different types of criteria that users may adopt as measurement for their evaluation.

i-Ergonomic criteria: These are explicit and normative criteria which are derived from standard dimensions and space requirements for performing different types of activity, they are useful for assessing adequacy of activity spaces standards.

ii-Space standards: These are explicit and empirical or normative criteria, such as schedules or guide of accommodation are produced by the responsible departments or locally produced standards for existing buildings. Available standards may not suit local purposes and may need modification (standards for new buildings may not be appropriate for existing buildings).

iii-Technical performance: These are explicit and normative standards for engineering services. These are the

range of measures indicating planned performance levels (e.g., temperatures, numbers of air changes and so on).

iv- Planning norms: These are explicit and normative criteria, usually static ratios which indicate relationship between scale of provision of one facility or between size facility and catchment's population. These ratios usually embody assumptions about space utilisation service, demand and subsequent service, which are often difficult to ascertain.

v- Planning policies: These are explicit and implicit criteria. These policies indicate how the building was supposed to work and can be used to examine how well the building itself fulfils its design expectations. These documents are basically the brief for the buildings and will therefore tend only to exist for relatively new buildings.

vi- Operational manuals: These are explicit, empirical or normative criteria. These documents are intended to instruct users on how the building was intended to operate (the planning policies). The operational manuals provide a useful comparison of current intent with design intent and also measurement criteria against which to compare current functioning which may differ from what is set out in the operational manual.

2.3. The scale of the evaluation programme

Although it would be ideal to establish a large scale evaluation programme, this would require qualified personnel and considerable resources not always available. Therefore it is suggested that a small scale evaluation programme should be set up initially.

In order to achieve an efficient evaluation programme it would be necessary to employ personnel trained and qualified as architect, who are not only experienced in both design and evaluation of buildings but also specialise and have expertise in the design of sports and leisure building's. However, in Algeria the supply of this sort of personnel is very limited. The alternative would be to use a small number of Algerian architects trained abroad and any available foreign experts with these skills to set up the programme and to train the Algerian personnel needed to expand it.

Another constraint to setting up a large programme initially is the immensity of the country and the variation of the climate from one region to another, which has implication for the design of sports and leisure centres. Rather than trying to set up an evaluation programme for the whole country, a specific region would be selected to establish a pilot evaluation programme. The urbanised north coastal region would be the most suitable area because, first, it is likely that a higher level of resources could be made available by the appropriate administrative departments, which are more developed than those in the south. Second, the greater population concentration in the north part of the country means that there will be greater provision of sports and leisure facilities than in the south. Third, the whole north coastal region has a similar climate and so sports and leisure centres there would be likely to contain the same activities and require the same design considerations in terms of methods of construction, environmental services, and finishes of floors, walls and ceilings.

Although the scale of the initial evaluation programme would be limited, it would allow experience to be gained on which a future enlarged evaluation programme could be based to be expanded, in time, throughout the country.

3. CONCLUSION AND FUTURE ISSUES

Post-occupancy evaluation is a phase in the building process that follows the sequence of planning, programming, design, construction and occupancy of building.

Research in post-occupancy evaluation is still at an early search stage. Clients and users, having to live with too many building problems, are realising that the evaluation of existing buildings has a real advantages, for both renovation and new construction. The scope of research is not limited to the technical area, but also includes the functional area. Even in the behavioural area research results have demonstrated the basic relationships of physical design to security, privacy, sociability and space use [14,15].

In recent years, the field of post-occupancy evaluation has expanded from the academic to the professional world. Today, POEs are conducted as part of the specialised services being offered by a growing number of consultants, as well as selected number of progressive architectural and planning firms. Thus, POE is now becoming an established discipline that influences all phases of the building process [16]. The inclusion of evaluation in the architecture curriculum, the expansion of programming activities in architectural offices, the new awareness of building owners and users, and critical requirement for more energy-efficient building will all help bring about the change [17].

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