PENILAIAN KINERJA BANGUNAN MELALUI EVALUASI PURNA HUNI (STUDI KASUS: GEDUNG PERKULIAHAN ARSITEKTUR, UNIVERSITAS NEGERI MANADO)

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ABSTRAK

Bangunan didesain untuk memenuhi kebutuhan dan keinginan dari pengguna bangunan. Tujuan perancangan dari sebuah bangunan akan tidak tercapai jika penggunanya tidak puas dengan keseluruhan kinerja bangunan. Penelitian ini menentukan apakah pengguna dari gedung perkuliahan prodi Arsitektur Universitas Negeri Manado puas dengan keseluruhan kinerja bangunan. Penilaian menggunakan pengguna sebagai tolak ukur menunjukkan bahwa potensi untuk peningkatan kinerja bangunan sangatlah besar. Hasil penelitian ini mengembangkan sebuah kerangka Evaluasi Purna Huni yang mengintegrasikan atribut – atribut kinerja bangunan dari gedung perkuliahan prodi Arsitektur dan fasilitas – fasilitas dalam kawasan Universitas Negeri Manado berdasarkan kepuasan pengguna. Tujuannya adalah untuk mengidentifikasi konsep Evaluasi Purna Huni dalam hubungan dengan kinerja bangunan untuk menentukan tingkat kinerja dari bangunan yang dinilai, dan untuk menentukan korelasi antara kinerja bangunan dan tingkat kepuasan pengguna. Hasil penelitian menunjukkan bahwa 82% dari atribut – atribut kinerja bangunan berkorelasi sangat tinggi dengan kepuasan pengguna. Hasil dari korelasi mengkonfirmasikan relevansi dari Evaluasi Purna Huni sebagai sebuah alat penilaian kinerja bangunan. Hasil penelitian juga menindikasikan bahwa indikatot – indikator dan variable – variable yang digunakan dalam menilai tingkat kinerja bangunan adalah signifikan dalam menentukan tingkat kepuasan penggunan dari gedung dan fasilitas perkuliahan prodi Arsitektur Universitas Negeri Manado.

Kata kunci: *Evaluasi Purna Huni, Kinerja Bangunan, Tingkat Kepuasan*

PENDAHULUAN

Konsumsi sumber daya yang berlebihan (*overconsumption*) dan pertambahan populasi yang berlebihan (*overpopulation*) mengakibatkan meningkatnya kebutuhan dan konsumsi energi dari tahun ke tahun. Terbatasnya sumber daya alami untuk memenuhi kebutuhan energi tersebut akhirnya menyebabkan terjadinya krisis energi pada abad ke-21. Hal ini tentu juga berdampak terhadap penggunaan energi dari bangunan.

Educational buildings, facilities, and their environmentmust be accorded with the highest premium for effective functioning and productivity (Olatunji, 2013). A completedand designed building should be able to perform its func- tions in the manner that will ensure

satisfaction for its occupants, and ensure effective function at all times (Nawawi and Khalil, 2008). Architects seldom receive usefulfeedback about the performance of completed buildings,
except from satisfied or dissatisfied clients or users. Evalua-tion by the actual users of a building is therefore important
for improving design quality (Ilesanmi, 2010). University buildings need an evidence-based plan to fix their issues permanently in the form of revised design standards and oversight processes. Universities can learn from their past
to improve their building's functionality and efficiency in the future (Tookaloo and Smith, 2015).

Specialized work and literature about performance eva-luation and appraisals of university buildings in relation to their various architectural aspects are lacking. Leaman (2004) reported that the reason is because academic disciplines do not regard building performance as an area of legitimate interest. Many gaps have yet to be bridged. The provision of continuous and specific information that isderived from rigorous evaluative works and empirical evi-
dence to architects and other professionals that are mainlyconcerned with the design of this type of buildings are either unreliable or non-existent. Reliable statistical data as well as documented university briefs and plans are either non-existent or inaccessible to architects. University build-ings are highly dynamic institutions. Furthermore, studies that surround this subject indicated that university buildings and facilities are most prone to change as well as the mostexpensive to provide, enhance, renovate, and run (Krada et al., 2014).

The College of Engineering at the University ofSalahaddin-Erbil (SUE), in the Iraqi Kurdistan region was established more than four decades ago. It consists of multiple scientific departments, administrative buildings, and facilities. After its occupation, it underwent problems and deficiencies related to functional and environmental aspects. This requires in-depth research and studies to diagnose such problems and defects. Among the research trends related to this issue is the post-occupancy evaluation(POE) approach for having a distinct mechanism in finding solutions to the buildings in use, in addition to offering possible alternatives that may enrich the design process
feedback. These approaches are in line with the needs anddesires of the occupants to avoid recurrence in subsequentdesigns of buildings and facilities in the future.

POE is one of the best practical ways to find and realizeobstacles and errors. It is different from other evaluation
methods in that it emphasizes the needs and values of building occupants (Preiser and Vischer, 2005). The poten-tial of such an approach of studies extends beyond the benefits for improvement to a specific building under investigation. It probes outcomes and makes recommenda-

tions that open opportunities to enable transfer of knowl- edge in future projects (Lackney, 2001; Zimring, 2002; Ayeet al., 2004; Mastor and Ibrahim, 2010).

In short, the building facilities and services must fit the purpose of the users. POE is the evaluation of the performance of buildingsafter they have been occupied. In addition, POE provides a
mechanism for understanding the mutual interaction pro- cess between buildings and users' needs and for recom- mending ways of improving the environment necessary to accommodate these needs (Nawawi and Khalil, 2008).

In this paper, we aim to show that POE is a tool for facility managers, architects, designers, and decision makers to identify and evaluate the behavior of a building. POE can then provide design guidance for future facilities. With thehelp of POE, facilities can have better space utilization andsave time and money in operation and upkeep costs (Preiser, 1995). One of the purposes of POE in higher education is todetermine whether the building meets the goals and visionsof the university. POE is the collection and review of user satisfaction, space utilization, and resource consumption ofa completed constructed facility after occupation to iden- tify key occupant and building performance issues. POE canalso be used to analyze trends over time, as well as to identify ways in which to improve on-going processes and outcomes. Implementing POE process increases account- ability for facilities managers, standardizes best practices,and helps the university to understand opportunities for future project improvements (Tookaloo and Smith, 2015).

Increasing the efficiency performance, quality, and levelof productivity of university buildings and facilities is a
pressing need of the construction industry in the Kurdistanregion, Iraq. The main purpose of the study is to evaluate the condition of an existing university building and itsfacilities at Salahaddin university-Erbil, Iraqi Kurdistan region, by using POE as a tool in examining the relationshipbetween users' satisfaction and building performance to
improve future development that meets users' require- ments. Many previous research studies have shown signifi- cant outcomes in optimizing the performance of buildings by applying POE as a viable research tool. The present studyprovides a clear depiction on how certain quality and
performance elements and attributes of the educational environment contribute to creating conditions that areconsistent with users' satisfaction.

TINJAUAN PUSTAKA

The terms *building appraisal, building evaluation, buildingdiagnosis, POE,* and *buildings in use* describe studies that focus on completed building projects (Ilesanmi, 2010).Preiser and Schramm (1998) attempted to widen the scopein the direction of building performance evaluation, to integrate user and aesthetic factors with technical and economic factors. Watt (2007) uses the term *"*Buildingpathology*"* to describe that aspect of building appraisal that is concerned principally with defects and associated remedial action. Although Duffy (2008) suggests the exis- tence of a terminological dilemma, these concepts aim to find how the completed building performs; determining possible misfits, mistakes, or omissions; and accumulating information for future programming and design efforts. However, Preiser and Vischer (2004) consider POE the mostcommonly used term for the activity of evaluating buildingsin-use. POE is about procedures for determining whether design decisions made by the architect are delivering the performance needed by those who use the building.

By using occupants as a benchmark in evaluation, POE provides enormous potential for improving the performanceof a building. POE evolved to fill the gap in the conventionalbuilding process, which consists of planning, programming,design, construction, and occupancy of a building. It represents the vital diagnostic step that is needed to feed the prescriptive tools of planning and programming (Van der Voordt and Van Wegen, 2005). POE is a systematic manner of evaluating buildings after they have been built and occupied for a duration of time (Preiser, 1995, 2002). The gapbetween the actual performance of buildings and explicitlystated performance criteria constitute the evaluation (Preiser et al., 1988).

One of the applications of POE is the comparison between the use that the designer intended for an environment andthat to which its users put it. The merits of POE are diverse.First, it ensures the sustenance of building performance, particularly of public buildings and facilities. In this con- text, Vischer (2002) suggests that POE is used in determining building defects, formulating design and construction cri- teria, supporting performance measures for asset and facility management, lowering facility life cycle costs by identifying design errors that could lead to increased maintenance and operating costs, and clarifying designobjectives. Second, POE provides a mechanism for under- standing the mutual interaction between buildings andusers*'* aspirations and for proposing ways of improving the environment necessary to accommodate these aspirations (Vischer, 2002;

Ilesanmi, 2010).

Although informal and subjective evaluations of the environment have been conducted throughout history, sys-tematic evaluations that use explicitly stated performance criteria with which performance measures of buildings are compared, is of more recent origin. POE evolved from the architectural programming techniques of the late 1950s and early 1960s. Early significant evaluative efforts were in response to severe problems faced in institutions such as mental hospitals and prisons, some of which were attribu- table to the built environment (Ilesanmi, 2010). The 1960ssaw the growth of research that focused on the relationship between human behavior and building design, thereby leading to the creation of the new field of environmental design research. The 1970s witnessed a significant increasein the scope, number, complexity and magnitude of evaluation studies and publications. The decade was marked by developments such as the use of multiple buildings for datacollection and comparative analysis; the use of multi-method approaches to building evaluation; the investigation of a comprehensive set of environmental factors, not as isolated variables, but to access their relative importance to the users of the facilities; and the addition of technical and functional factors to the scope of evaluation studies, compared with the earlier emphasis on strictly behavioral research. The final decades of the century were the era ofapplied evaluation in which POEs became routinely used (Preiser, 2002).

Architecturally, evaluation research falls into three envir- onmental dimensions: the physical, the social, and the socio-physical environments. In all cases, the assumptionis that users judge the adequacy of their environments based on predefined standards of quality. Some studies evaluate cognitive responses to the physical environment and focus on issues such as the perceived quality of buildings and environmental quality (Cold, 1993; Kane et al., 2000; Fornara et al., 2006; Nwankwo et al., 2014). Van der Voordt and Van Wegen (2005) described quality as the extent to which a product fulfills the requirements setfor it; and "architectonic quality" as an umbrella term that covers various aspects of quality such as aesthetic, func- tional (building efficiency), symbolic, and cultural value. Other studies attend to the evaluation of the quality of the built environment in terms of effective responses, using user assessment of the environments (Al-Momani, 2003).

Three levels of effort in typical POE workhave been identified, namely: (1) indicative,

(2) investiga-tive and (3) diagnostic. "Effort" refers to the amount of time, resources, and personnel; the depth and breadth of investigation; and the implicit cost that is involved inconducting a POE. Indicative POEs provide an indication of major strengths and weaknesses of a particular building's performance. Investigative POEs are more in-depth,whereby objective evaluation criteria are explicitly stated. Diagnostic POEs require considerable effort and expense and utilize sophisticated measurement techniques (Preiserand Vischer, 2004) because POE is the process of obtainingfeedback on a building's performance in use. The value of POE is being increasingly recognized, and it is becoming mandatory in many public projects. POE is valuable in all construction sectors, especially healthcare, education, offices, commercial, and housing, in which poor building performance will affect running costs, occupant well-being and business efficiency (Lawrence, 2013).

The most important benefit of POE, however, is contin- uous improvement of quality and performance of facilities.This is particularly beneficial in projects with reoccurring construction programs or in which a significant number of facilities are typical (Preiser, 1995), such as a university campus. This review of literature confirms the relevance of POE in university building evaluation. Thus, research and studies adopting this trend has continued and increasingly developed. Many institutions, governmental authorities,agencies, research centers, forums, and scientific conferences have been devoted to and responded to the data and outcomes of this distinctive research approach because of its direct effect and relation to the sector of construction industry and building performance. However, despite the large number of research in the context of building perfor-mance, POE as a systematic method of collecting data on buildings in use has not found wide usage for university buildings and facilities in the Iraqi Kurdistan region, hencethe need for this study.

DAFTAR PUSTAKA

Attmann, O., 2012, Green Architecture: Advanced Technologies and Materials, The McGraw-Hill Companies.

Chappel, T.W., 2009, High Performance Green Building: What's it worth? Investigating the Market Value of High Performance Green Buildings, Washington State Department of Ecology

El-Wassimy, M. M., 2011, *High Performance Building,* Alexandria University

Enache-Pommer, E., and Horman, M. 2008. "Greening of healthcare facilities: Case studies of children's hospitals." Proc., AEI 2008 Conf.—AEI 2008: Building Integration Solutions, Vol. 328, ASCE, Reston, VA

Horman, M. J., et al. 2006. "*Delivering green buildings: Process improve- ments for sustainable construction*." *J. Green Build.*, 1(1), 123–140.

Juarti, E., 2015, Penentuan Indikator Kinerja Bangunan Gedung Pendidikan, Jurnal Fondasi Vol.4 No.2 Tahun 2015

Kementrian ESDM, 2014, Laporan Dewan Energi Nasional Tahun 2014, Jakarta

Larasati, D., 2018, Arsitektur Hijau, ITB Press, Bandung

Ragheb, A., 2016, *Green Architecture: A Concept Of Sustainability*, Procedia Journal: Social and Behavioral Science 216 (2016)

Reed, B., 2009, The integrative design guide to green building: Redefining the practice of sustainability, Wiley, Hoboken, NJ.

Ott, R. L., and Longnecker, M. T. 2010. *An introduction to statistical methods and data analysis*, Brooks/Cole Cengage Learning, Belmont, CA.

Tormenta, L. M., 2011, *High Performance Building Guidelines,* The New York City Department of Design and Construction (DDC), New York

Xiangdong, C., 2016, Building Energy Consumption Status Worldwide And The State-Of-The-Art Technologies For Zero-Energy Building During The Past Decade, Journal Energy and Buildings Vol.128, p.198-213.