

**UNIVERSITI TEKNOLOGI MARA**

**ENVIRONMENTAL DESIGN  
FRAMEWORK FOR PUBLIC  
HOSPITALS IN MALAYSIA**

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## ABSTRACT

The main priority of Hospital design quality in Malaysia is to arrange passive design for staff and patient-oriented care design that requires a user-friendly environment. Although there are various quality design evaluations, evaluating success criteria has brought a new dimension to tracking the quality used by exploring the user experience. Furthermore, the method does not have a procedure to identify users' needs effectively. Still, it will lead to quality and energy efficiency dimensions that need to be considered in its implementation. Therefore, this research aims to achieve energy efficiency through the experiences of patients and staff in public hospital ward spaces. The nature of the staff and patient experience can influence the quality and energy efficiency of the hospital environment. The theory section suggests that the experience of hospital end users may be understood through their feedback on the status of the hospital environment by extending the theory of passive design and quality. This research uses five success criteria passive design identified from the literature. After synthesizing the literature, verification from the expert panel from each sector, namely the Public Work Department (Healthcare Facilities Projects), Medical Planner (Architect), and Consultant (Architect) who are directly involved in hospital design, is implemented. The qualitative method, interviews with an expert panel (n = 8), was conducted to find out the criteria of passive design are adapted to the creation of public hospitals implemented. Next, the data were analyzed using NVivo 12 to be part of the questionnaire developed. In addition, the success parameters of passive design were made through a questionnaire in the context of user experience of using the physical environment for energy efficiency in the Hospital. It is to find out that the impact of the design of this hospital is experienced by users who use it. A phenomenological philosophy and quantitative approach with case studies were conducted in three Malaysian public hospitals. Questionnaires were given to staff and patients (n = 154) involved in the hospital ward, and the data obtained was taken from the perspective of the user experience was conducted. Data were analyzed using factor analysis conducted by SPSS as this is the best way to get holistic information related to user experience. Research findings have been studied, and a refined framework of passive design success criteria has been conducted and confirmed a practical approach to this user experience method. The main contribution of this study is that the success criteria have provided added value in evaluating experiences among staff and patients, quality design evaluation, designing, building, and managing hospitals for energy efficiency. Therefore, this study should help organizations understand the needs of end-users and support the design of a user-friendly environment. Furthermore, this research provides a starting point from different backgrounds with more perspectives from the point of view of other actors.

*Keywords: Passive Design, Public Hospital, Success Criteria, Framework, Energy Efficiency*

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction to the Research

This thesis develops a passive design framework based on the success of the design criteria of the physical environment of energy efficiency to track the quality of the architecture being used. The result of this framework is a composition in understanding the experiences and expectations among users in the ward space towards the natural environment and facilities that bring quality and practical physical environment design. The study's aims and objectives that focus on research design were addressed through the research questions that need to be answered based on this study's merits. The ease of designing quality and beneficial physical environment gives the advantage of using this passive design.

### 1.2 Background of the Research

Malaysia is a developing country with a growing population and economic activities, especially healthcare. It has been one of the main drivers of increasing demand for energy consumption (Reddy et al., 2019). The energy used in the building rises significantly due to the homogeneous environment created by the designer and the solution from standard engineering. Most buildings waste much energy by not responding to their climatic conditions and comfort requirements. Therefore, energy consumption in the building needs to be handled efficiently and optimally. The Environmental and Energy Branch reports issued under the Malaysian Public Works Department through the Building Sector Energy Efficiency Project (BSEEP) state that energy consumption by 50% and more is in buildings (Kamaluddin et al., 2016). Therefore, the use of energy in the building must be handled more holistically to curb the increase.

Most disciplines agree that the right design from the environmental aspects of energy use in hospital buildings affects physical, mental, and psychological health outcomes. Healthcare designers commonly regard a hospital's architecture as technically and psychologically complex. The designer must comply with the different requirements as determined by the Ministry of Health (MOH). Building services are