

**UNIVERSITI TEKNOLOGI MARA**

**SCHOOL FURNITURE ERGONOMICS:  
OPTIMAL DESIGN CRITERIA FOR  
STANDARD REQUIREMENTS IN  
MALAYSIAN EDUCATION SYSTEM**

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Thesis submitted in fulfilment of the requirements  
for the degree of  
**Doctor of Philosophy**


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## Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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## Abstract

The problem of design mismatch led to the enquiry of the study. The aim of the study is to determine the optimal design criteria of school furniture that match with user requirements and fulfill the learning system in Malaysia. By exploratory and descriptive research, the objective was to identify principles, elements and characteristics on design strategy and design features based on perceived evaluation of existing school furniture on desks and chairs focusing on 'User' from social ergonomics perspective. Therefore, field survey was conducted among User group participants ( $n = 2079$ , 895 boys and 1184 girls) from 4<sup>th</sup> year secondary public schools students in Klang Valley representing the Malaysian sample, including the School Management groups among the Education Ministry, School Administrator and Furniture Supplier. Both qualitative and quantitative research methods were adopted. Instruments used for gathering data interviews on design strategy were semi-structured questions; whereas on survey questionnaires of design features, interval scale rating methods were used to measure user satisfaction, problems and expectations. Specifically, the content analysis on school management reveals the major factor of dissatisfaction is poor structure and the existing school furniture design requires revision. Statistical data analysis by SPSS on user shows there are 5 principal components that emerged as the important factors of school furniture design criteria. Whereby, the mean level of satisfaction on the factors of 'general appearance', 'strength and durability', and 'usability' were below average except for 'anthropometry' as average; whereas, on the factor of 'health and safety', the mean level of problem occurs sometimes. Subsequently, the ranking order of user expectation reveals that 'comfort, health and safety' as the highest followed by 'image and appearance' as the least important. Overall results indicated that there is a mismatch between school furniture and the user requirements. Consequently, students are at a disadvantage in using school furniture design that is inappropriate with their satisfaction and expectation in the learning system. In conclusion, research outcome that determines optimal design criteria provides solutions to the problem and substantial contribution to the nation and the industry.

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