



414: THE CONTRIBUTION OF ECOLOGICAL DESIGN TO GREEN PLANNING APPROACH OF A UNIVERSITY CAMPUS IN MALAYSIA



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1.0 Introduction

- ✓ Topic – application of ecological design (ED) concept in planning a university campus in a sustainable manner
- ✓ Assessing the level of compliance of ED as a tool in UPM Serdang campus
- ✓ ED brings together human convenience by sustainable use of natural resources.
- ✓ Very timely in Malaysia - Pertubuhan Arkitek Malaysia (PAM) and Univ. Putra Malaysia (UPM) signed MoU to develop Green Building Index (GBI).

Study Objectives

- To determine the present ED features that are being practised in education buildings in UPM campus.
- To improve the current situation by applying the principles of ED in creating sustainable environment.
- To recommend the health check of existing building by applying the principles of ED.

Research Problems

- Lack of application of** environmental-friendly approach in local education buildings has contributed environmental problems.
- The current building design of education buildings demonstrates that it has **decreased the environmental quality locally**.
- The recognition of ED approach is very low in Malaysia that needs more attention if we want to support sustainable development.

3.0 Analysing The Implementation Of Ecological Design Concept In UPM Serdang

- Assessing the level of ED concept in planning faculty buildings in UPM Serdang, campus.
- The analysis methodology used starts from the overall picture, before narrowing it down to each factor
- Based on a set of rating system in a simplified method that suits the overall study.

Figure 3: Ecological Design Rating System for UPM in the observation study covering a total of 23 buildings

No.	Name of building/faculty
1.	Faculty of Environmental Studies (Block A)
2.	Faculty of Environmental Studies (Block B)
3.	Faculty of Food Science and Biotechnology (Administrative and Academic building)
4.	Faculty of Veterinary Medicine
5.	Faculty of Agriculture (Jabatan Sains Haiwan)
6.	Faculty of Land Management
7.	Centre of Agriculture Science
8.	Faculty of Biotechnology and Biomolecular Sciences
9.	Centre of Information Development and Communication
10.	Faculty of Human Ecology
11.	Faculty of Human Ecology (Lecture hall)
12.	Faculty of Science
13.	Faculty of Economics and Management
14.	Faculty of Forestry
15.	Faculty of Science (Department of Biology)
16.	Faculty of Mathematics
17.	Faculty of Agriculture
18.	Library of Sultan Abdul Samad
19.	Faculty of Agriculture (Department of Agriculture Technology)
20.	Faculty of Human Ecology (Department of Resource Management and Consumer Studies)
21.	Faculty of Educational Studies
22.	Administrative and Business Building
23.	Faculty of Postgraduate Studies

Table 2: Overall Results According to Factors

Factor	Level of assessment				Sub-total earned	Desired full point	Percentage
	Very significant (3 points)	Moderate significant (2 points)	Minor significant (1 point)	Not applicable (0 point)			
A. Sustainable Site Selection	16.8	2.5	1.2	0	20.5	33	62.1
B. Water and Energy Efficiency	2.3	0.3	0.2	0	2.8	21	13.3
C. Materials and Resources	0.3	1.4	0.2	0	1.9	12	15.8
D. Indoor Environmental Quality	12.8	1.0	0.5	0	14.3	18	79.4
E. Productivity, comfort and well-being of building occupants.	5.7	3.7	1.5	0	10.9	24	45.4
TOTAL POINTS	37.9	8.9	3.6	0	50.9	108	47.1

□ indoor environmental quality has the highest point earned, i.e. 14.3 as compared to the desired point, i.e. 18, which make it achieved 79.4%

4.0 Findings

- The compliance level to the concept of ecological design- the majority buildings in UPM Serdang campus complied with the concept of ecological design and can be considered as moderate level-newer buildings responded rather satisfactory compared to the older buildings.
- The strongest factor of UPM management
The indoor environmental quality is the strongest factor of the ecological design concept -The application of these elements shows that the management of UPM has started this good effort and should be enhanced further in the future.
- The weakest factor of UPM management
Water and energy efficiency is the weakest factor-the management of UPM did not find this factor as a priority in constructing the faculty buildings.

Selected references:
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Figure 1: Scopes involved in the study

Scopes of Study

The identification scopes of the study are divided into three main aspects, as follows:

- Factors** involved in applying the concept of ecological design;
- Architectural **design** and environmental **quality**; and
- The impacts of **material** on the environment.

2.0 Research Methodology

Two research methods were used in data collection, they are: document analysis; and observation

Figure 2: Research Methodology

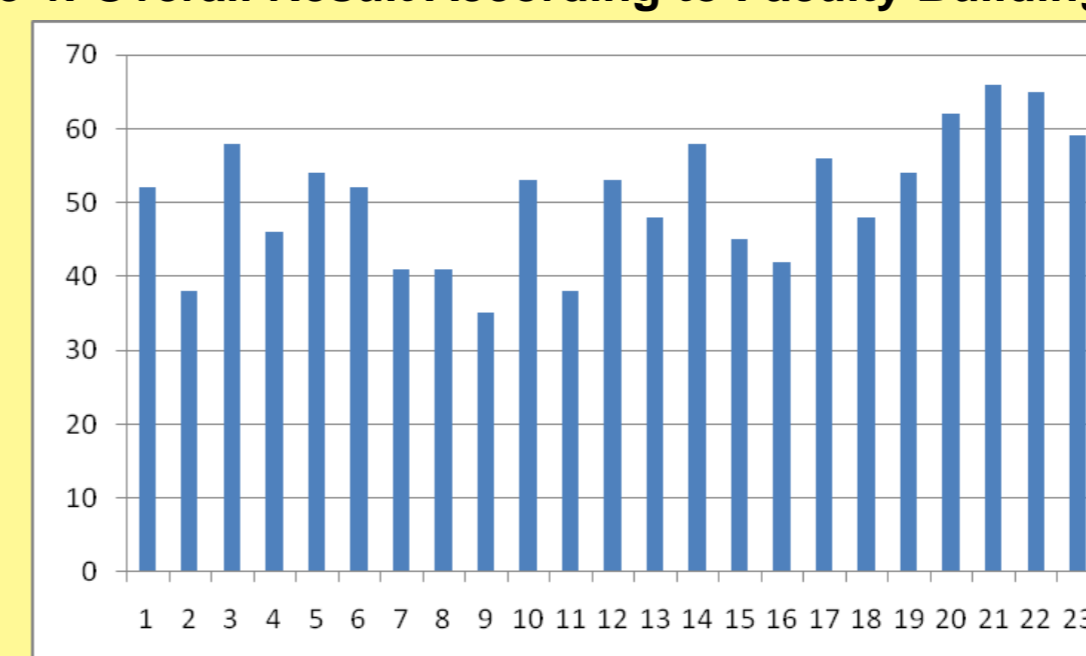
Document analysis:
Supplementary information to the primary research

Observation:
A direct observation was conducted on the building to verify the assessment of document analysis and theoretical study.

Table 1: Classification of ecological design in UPM Serdang campus

Colour	Weightage	Remarks
Red	<36 points	Respond poorly to the ecological design concept in which the construction does not employ the principles of ecological design
Yellow	37-72 points	Respond moderately to the ecological design concept in which the construction employs some parts of the principles of ecological design
Green	>73 to 108 points	Respond significantly to the ecological design concept in which the construction employs many principles of ecological design

Figure 4: Overall Result According to Faculty Buildings



- Lowest point earned was 35
- Highest point was 66 (Faculty of Educational Studies)



5.0 Conclusion

- ✓ the undertaken research has proved that the concept of ecological design can be used as a tool towards achieving the notion of sustainable development.
- ✓ The research held in UPM Serdang campus however did not produce encouraging results as it can be considered as moderate satisfactory only as compared to the desired expectation.
- ✓ The recommendation that had been formulated can be of some assistance to the management of UPM that would improve the current condition of buildings in terms of designing, planning and management.

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