

Task Assessment as Learning Tools to Meet Actual Architectural Issues

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Abstract

The issue of disability and Green Building often ceases only as a discourse in seminars or as a design theme for student assignment. Meanwhile, design requirements considering disability have not become a binding rule to submit in planning and construction yet, especially in public buildings design, as well as green building codes. It has to start from the awareness of the planner from the early stage through architecture education to educate the society. The studio task assessment system which contains points of assessment on meeting the standard of issues for the disabled will be an effective learning tool. Students are shaped as planners to be and responsive to the disability needs as a result. Software utilization in the learning process to test the circulation design reliability, deserves to be rewarded for high points.

Keywords: Disability, Regulation, Task Assessment, Learning Tools, software

1. Introduction

The closeness of family ties is a cultural feature of living in Indonesia. One residence can be inhabited more than one family of different ages. The system of settlements in large cities is turning to the vertical home system as a solution to the number of decent housing needs, for the middle to lower economic community. Parents in the family will someday begin to need a mobility aid to move around, alone or with the help of others. Similarly, family members with disabilities are rarely found to be entrusted to a home for disabled, but they also are rarely found traveling without assistance. Thus the readiness of the circulation design on the vertical settlement system should be prepared to accommodate persons with disabilities and the elderly according to Peraturan Menteri PU no 05/PRT/M/2007.

Traveling with elderly parents, persons with disabilities in the family, pregnant women, family members during a healing period, requires the readiness of other family members. Preparation begins with finding solution to move horizontally and vertical, also the availability of toilet facilities, seating, stairs in public facilities Peraturan Menteri PU no 30/PRT/2006 pasal 1.

The design of buildings that have prepared facilities and circulation for persons with disabilities is the design of hospital buildings, considering the residents are ambulatory, bed ridden and one day care patients. Several new building designs, such as shopping centers and hotels in big cities, have complemented the design with parking facilities, toilets, elevators that are wide enough for people with disabilities and the elderly. However, the continuity of circulation between destinations within the zone of both horizontal and vertical buildings has not been considered well. The design of the ramp is still a facility that facilitates the movement of goods.

Design of a building which prepares for persons with disabilities should provide more space for vertical circulation facilities from outside the building to the inside and vice versa. Circulation between different floors also requires more space planning. A new theme in designing with a concern to disabled people and the elderly developed in 2009 (Joachim Fischer, Philipp Meuser, 2009). It was a barrier free theme in a building design, which enables disabled to move without co-assistance in both horizontal and vertical circulation, mechanical transport is required, whereby its application should begin to be considered against the green building issue.

Peraturan Menteri PU dan Perumahan Rakyat no. 02 / PRT / M / 2015 pasal 25 on Green Building that has been socialized since year 2015, regulates the selection of building objects which are classified as green buildings. Design and implementation of buildings which are classified into green buildings will be accompanied by the TABGH expert team. Socialization efforts to the community have been done through seminars and impressions on social media, still few planners apply this rule. Green building issue leave as an interesting topic in a seminar or theme in architectural education studio tasks. How should architecture education take the responsibility?

2. Literature Review

2.1. Green Building Regulation

The issue of green buildings has been regulated in Peraturan Menteri PU and Perumahan Rakyat no 02/PRT/M/2015 pasal 8, whereas for the time being 9 classes of buildings subject to the requirements of green buildings are determined based on the complexity of the functions of the building's activities and the height of the buildings. Classification according to the height of the building is regulated in other regulations PermenPU no 29 of 2006 bagian II. The level of imposition of green building requirements is classified into 3 levels: mandatory, recommended and voluntary according to Peraturan Menteri PU and Perumahan Rakyat no 02/PRT/M/2015 pasal 5.

2.2 Site Planning on green building design

The requirements of the Technical Planning Stage involved the requirement on site management including building orientation, site processing, contaminated land management of B3 waste, private green open space, basement tread processing, parking lot provision, outdoor or courtyard lighting system, construction of buildings above and / or underground and water and/or public facilities and provision of pedestrian paths in Peraturan Menteri PU and Perumahan Rakyat no 02/PRT/M/2015 . The scope of the facility's technical guidelines and accessibility regulations which should be prepared in each building design should be considered against persons with disabilities and the elderly according to Peraturan Menteri PU no 30 of 2006 pasal 1. Thus every building construction activity should pay attention to all technical guidelines covering the basic size of free floor space, Door, ram, stairs, elevator, stair lift, toilet, shower, sink, telephone, furniture, control equipment and equipment, and markers. Site construction should pay attention to the size of the floor, pedestrian path, parking area, ramp, signs and markers. While construction of the outdoor environment should pay attention to the technical guidance of facilities and accessibility on the floor size, pedestrian path, guiding lane, parker area, ramp, signs and markers.

Fire Protection System in building and environment is considered to the height of the building, the number of occupants, referring to the Peraturan Menteri PU no 26/ PRT/M/2008. Requirements on planning, provision and utilization of urban pedestrian infrastructure and facilities in urban areas refer to Peraturan Menteri PU no 03 / PRT/M /2014 pasal 1.

2.3. Project Based Learning Method implementation in the Architecture Studio education

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem or challenge.

2.4 UNESCO-UIA Charter for Architectural Education

Objectives of architectural education according to UNESCO-UIA Charter 2011 – Seoul September 2017 for architectural education, is to meet an understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale.

Need of continue and contiguity circulation for disabled and aged should be fulfilled by this.

Architectural education involves the acquisition of design, knowledge and skills capabilities. Knowledge capability related to design has to meet:

- Understanding of services systems as well as systems of transportation, communication, maintenance and safety
- Understanding of the processes of technical design and the integration of structure, construction technologies and services systems into a functionally effective whole.

This means that these capabilities is to be reach as learning out comes at the end of a studio project.

3. Methods

In order to get an idea of how learning methods about facility design preparedness for people with disability is applied thoroughly in studio and response, observation on rubrics of 2 design studios and rubrics of 2 Structure and Construction responses. The rubric analysis is done by comparing the applicable regulations on person with the disabilities and the elderly and how the rating points influence the final score to get an excellent credit.

4. Study and Out comes

The study was taken on rubrics of the Architecture Department Studio of Institut Teknologi Nasional Bandung. Focused on how rubric of each studio and response contains point of assessment which meets the disabled and elderly needs of adequate circulation. Assessment task on Studio rubrics of the 5th and 6th semester and also the rubrics of the Structure and Construction Response of the 4th and 5th semester will be appropriate to this study.

Job given in 5th semester studio is a design on a 4 stories public building such as shopping mall or a dormitory, while in the 6th semester studio is a design of a public building of a long-span roof design such as indoor sport facilities or auditoriums. This type of building has to accommodate disabled activities according to Peraturan Menteri PU no 30 of 2006 pasal 1. Point of assessment in each rubric table marked with (*) symbol.

Table 1: Rubric of 5th Semester Architecture Studio

ARCHITECTURE DESIGN STUDIO IV		
Studio TASK Evaluation Sheet		
4 STOREY RETAIL BUILDING DESIGN		
Odd Semester: 2017/2018		
JOB II:		
CONCEPTS		
Mentor :		
A. CONCEPT COMPLETENESS		40%
1	GENERAL CONCEPT	
	· Building definition	
2	SITE CONCEPT	
	· Site analysis & mass ordering pattern on site	
	· Circulation system for vecycle and pedestrian on site *	
3	ARCHITECTURE CONCEPT	
	· Spacial Program & flow of activity	
	· BCR and FAR, site area	
	· Zoning analysis and building circulation design *	
	· Facade concept and materials	
4	STRUCTURE CONCEPT	
	· Modul of Structure	
	· Structure system, foundation, retaining wall, beams, and roof	
	· column, beam, floor dimensionering and stair geometry	
5	BUILDING SERVICE CONCEPT	
6	BUILDING CONTROL CONCEPT	
B. RIGHTNESS OF CONCEPT		30%
1	Regulation (5%)	

2	Space Requirement Program (10%)	
3	Structure (5%)	
4	Utilities (5%)	
5	Building Physics (5%)	
C. CREATIVITY		20%
1	Site concept (5%)	
2	Building concept (5%)	
3	Activeness in Preview (10%)	
D. TIME BOUND (Y/T*)		10%
P O I N T		
A : 80-100 B : 65-73 C : 50≤60 E : <41		
AB : 73≤80 BC : 60≤65 D : 40≤50		

Job given in the 4th semester on Structure and Construction response is analyzing a10 stories structure system of a rental office building or hotel, while in the 5th semester response is analyzing a long-span roof structure system of a public building.

Table 2: Rubric of 6th Semester Architecture Studio

ARCHITECTURE DESIGN STUDIO V		
Studio TASK Evaluation Sheet		
INDOOR SPORT/AUDITORIUM DESIGN		
EVEN Semester: 2016/2017		
JOB I:		
Mentor		
NO	C R I T E R I A	POINT
CONCEPT		
I. CONCEPT COMPLETENESS		40%
1	Building definition	
2	Site analysis, and mass form *	
3	Mass pattern on site planning	
4	Vehicle and pedestrian circulation systems on site *	
5	Spacial program, flow of activity	
6	Building and site regulation (BCR, FAR)	
7	Zoning analysis + building circulation design *	
8	Facade concept and material, Acoustics	
9	Vertical & horizontal structure loading analyze	
10	Structure Module	
11	Structure System, foundation, wide span roof	
12	Column, beams, floors dimensions and stairs geometry	
13	Structure Material (column, beam, roof)	
14	Building service concept	
15	Building control system concept	
II. RIGHTNESS OF CONCEPT		20%
III. Long Span Building Design, Building Control System, Structure design, and building service concept		10%
IV. AESTHETIC PRESENTATION on A3 Paper Format		10%
V. Preview		10%
P O I N T		
A : 80-100 B : 65-73 C : 50≤60 E : <41		
AB : 73≤80 BC : 60≤65 D : 40≤50		

Table 3: Rubric of 4th Semester Structure and Construction

RESPONSE OF STRUCTURE AND CONSTRUCTION 3: PRESENTATION OF STRUCTURAL CONCEPT ANALYSIS		
Studio TASK Evaluation Sheet		
10 STOREY RENTAL OFFICE BUILDING DESIGN		
EVEN Semester: 2016/2017		
JOB I:		
CONCEPT		
Mentor :		
NO	C R I T E R I A	POINT
1	ANALYSIS	
	Structural Dimensioning Analysis	10%
	> Structural Aksonometry Sketches	
	> Dimensioning of Columns, Beams and foundations	
	> Ramp geometry *	
	- Vertical Load Analysis (gravitation)	10%
	> Sketch of Deformation on structures due to gravity	
	> Load distribution pattern on superstructure (upperstructure)	
	> Tension / compression mechanism on superstructure element (upperstructure)	
	> The types of joints & their effects on the shape of structural elements	
	> The force mechanism on the foundation	
	- Horizontal Load Analysis (wind)	10%
	> Sketches of deformation tendencies on structures due to wind load	
	> Load distribution pattern on superstructure (upperstructure)	
	> Tension / compression mechanism on superstructure element (upperstructure)	
	> Types of joints & their effects on the shape of structural elements	
	> Scetch of force mechanism on the foundation	
2	RANCANGAN	
	1. Floor Plan Drawing	10%
	> Placement of utility equipment and shafts *	
	> Placement of Fire Stair *	
	2. Elevation Drawing	15%
	> Building façade	
	> Material Finishing Description	
	3. Section Drawing	20%
	> Clarity of depiction (visible and truncated)	
	> Roof structure system and roof drain system	
	> Foundation system, tie beam, basement, drainage and floor	
	4. Main Entrance Principle Section Drawing	25%
	> Shows Construction Details : Roof to Foundation	

		> Shows Notation, dimension and description of material	
P O I N T			
A : 80-100	B : 65-73	C : 50≤60	E : <41
AB : 73≤80	BC : 60≤65	D : 40≤50	

Table 4: Rubric of 5th Semester Structure and Construction

RESPONSE OF STRUCTURE AND CONSTRUCTION 4: PRESENTATION OF STRUCTURAL CONCEPT ANALYSIS			
Studio TASK Evaluation Sheet			
LONG SPAN ROOF STRUCTURE DESIGN			
Odd Semester: 2017/2018			
JOB I:			
CONCEPT			
Mentor :			
DESIGN ANALYSIS OF A LONG SPAN STRUCTURE			
NO	C R I T E R I A		POINT
1	LITERATURE STUDY		10%
		> Literature Study on Applied Long-Span Structure System	
		> Form follows function or analogy	
		> 3 D Sketches of structural aksonometry	
	Completeness and Creativity		
	Time Bound (Y/T*)		
2	CONCEPT ANALYSIS		20%
	- Vertical Load Analysis (gravitation)		
		> Sketch of Deformation on structures due to gravity	
		> Load distribution pattern on superstructure (upperstructure)	
		> Tension / compression mechanism on superstructure element (upperstructure)	
		> The types of joints & their effects on the shape of structural elements	
		> The force mechanism on the foundation	
	- Horizontal Load Analysis (wind)		
		> Sketches of deformation tendencies on structures due to wind load	
		> Load distribution pattern on superstructure (upperstructure)	
		> Tension / compression mechanism on superstructure element (upperstructure)	
		> Types of joints used & their effects on the shape of structural elements	
		> Scetch of force mechanism on the foundation	
	Completeness and Creativity		
	Time Bound (Y/T*)		
3	DESIGN ANALYSIS		
	1. Floor Plan Drawing		10%
		> Roof structure on column placement	
		> Placement of utility equipment	
	2. Elevation Drawing		10%
		> Building Proportion	

		> Main Entrance Design *	
	3. Section Drawing		15%
		> Height of inner space under the structure	
		> Main roofing support system	
		> Rainwater drainage system	
	4. Principle Section Drawing		25%
		> Roof construction and pedestal connection details	
		> Roof cover to the structure connection details	
	Completeness and Creativity		5%
	Time Bound (Y/T*)		5 %
P O I N T			
A : 80-100	B : 65-73	C : 50≤60	E : <41
AB : 73≤80	BC : 60≤65	D : 40≤50	

Job on both studios and response session has already meets the criteria of a design project in which disabilities and aged people should be facilitate according to the Table of minimum accessible facilities on regulation Peraturan Menteri PU no 30 / PRT / 2006 Ketentuan Penutup.

Rubric on the Structure and Construction at the 4th semester as shown in Table 3 contains specific value on the building core design which meets the regulation on fire escape in a 10 stories public building. Although the mid-test on the Structure and Construction response is to draw a section over the main entrance, there are no points on ramps design at the entrance to facilitate the disabled and aged. There is no point to a ramp design in the floor plan, as well as toilets for the disabled.

Refers to the rubric of the 5th semester Structure and construction response as shown in Table 4, also has no specific point to a ramp design yet, although has point on entrance porch and corridor design.

The 4th and 5th semester learning outcomes of the Structure and Construction subject has to be implemented on the 5th and 6th semester Architectural Design Studio according to the designed road map of the curriculum. Meanwhile the rubric on the 5th and 6th semester of the Design Architecture studio, already have point on accessible design in the site planning as shown in Table 1 and Table 2. Although toilets for disabled and aged could easily found in almost all design floor plan, yet there is no point as a credit to this design as shown in Table 1. No wonder that this design issue being forgotten in the higher studio.

5. Conclusion

Application of green building codes to meet the need for disabled and elderly in a building design, should begin with the architecture education. The learning method of Project Based Learning applied in the Architecture Design Studio and Structure and Construction Response can act as a proper teaching medium. Tasks assessment through rubrics are prepared to give point to the green issue based on regulations which applicable to the circulation of persons with disabilities and the elderly. This will improve students respect to the building code, as well as skill in design building properly.

The studio task assessment system that contains points of assessment on meeting the standard of issues for the disabled will be an effective learning tool.

6. References

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Peraturan Menteri PU no 05 / PRT / M / 2007 tentang Pedoman Teknis Pembangunan Rumah Susun Sederhana Bertingkat Tinggi.

Peraturan Menteri PU no 26/PRT/M/2008 tentang Persyaratan Teknis Sistem Proteksi Kebakaran Pada Bangunan Gedung Dan Lingkungan

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