

Adaptable Features in a Student Accommodation: A Case Study from Malaysia

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Abstract

One of the goals of this paper is to help understand adaptability in architecture. This includes various types of adaptability features, their importance and uses in terms of sustainability, economy and quality of life. Several interpretations of adaptability and flexibility from various researchers will be discussed, along with examples and case studies. However, the main aim of the paper is to discuss the needs of students and their desire and need for adaptability in their accommodation; focusing on the question that do students really need or use adaptable features when they want to stay for a short academic period in the accommodation. Based on the literature, we will see that adaptability has a lot to do with increasing the life of an accommodation in the sense that the inhabitants do not need to move to another house or apartment once their current accommodation is of no use to them. The adaptable accommodation will be able to ?adapt? to their ever-changing circumstances. However, the paper will focus very much on students, staying in a relatively adaptable accommodation and their response to the adaptable features offered to them. Do they even use these features as they are staying for only a short period?

Index terms— adaptable architecture, adaptability, flexibility, student housing, quality of life, efficiency.

1 I. Introduction

”If a building doesn’t support change and reuse, you have only an illusion of sustainability.” (Croxtton, 2003) hen people build or buy a house, they either anticipate spending numerous years in it or a relatively shorter time. A typical house is designed to fulfill the general and basic needs of the majority. Once those needs are fulfilled, the tenants usually move out and look for another house that meets their changed needs. An example of this can be the elderly tenants. A childless, married couple can be living in a certain house for many decades. However, once they reach a specific age, their housing environment no longer provides them with physical comfort and support that they might need. Therefore, that house has lived out its time and the couple must move on to a different house. This act of searching, moving, selling and buying a different accommodation can be tedious, costly and difficult in terms of human emotions. What if this family never had to move in the first place? What if instead of them looking for a different house that met their needs, their existing house changed itself for their everchanging requirements? This is the main idea of an adaptable house. It basically adapts effectively and efficiently to the ever-changing requirements and needs of the inhabitants, without any expensive and energy consuming alterations such as demolition, renovation or substantial modification to the existing structures and services. The city of Cyberjaya in Selangor, Malaysia, attracts numerous students globally due to the city being home to some of the most well-known universities in the country and abroad. These universities, such as Limkokwing University of Creative Technology and Multimedia University, brag about having multitude of students from all over the world. While many students play out their higher education phase in typically stable way, some students, especially from third world or wartorn countries suffer from financial issues.

For this purpose, flexible or adaptable housing can prove to be an excellent solution. Firstly, if designed well, the accommodation can be both aesthetic and functional, two things wanted and required by most foreign students. Secondly, the cost of rent will be reduced effectively as the long-term production and maintenance cost is lesser for an adaptable house/apartment than a rigid one. The factors of adaptability that will play a vital role will be such as students wanting to either share an existing unit with more students, friends, families, relatives etc. or wishing to turn a two-bedroom unit into a studio unit after the housemate leaves or graduates. Furthermore, the issue of oversupply of apartments/units can also be addressed by supplying adaptable apartments/units. They will also prevent the buildings from becoming obsolete over time as their functions will change as required, without needing extensive structural changes or demolition. Furthermore, according to a paper called 'Well-Being of UiTM Shah Alam Students Living in Off-Campus Environment' (Muslim, Abdul Karim, Abdullah, 2013), the housing development trends and fast-paced enrolments of students to universities currently are impacting the daily lives of students on the basis of comfort, safety and convenience. Relevant discussion will be carried out later in the paper.

2 II. Literature Review a) Housing Problems in Malaysia

According to a paper called 'Trends, Problems and Needs of Urban Housing in Malaysia' (Salfarina, A.G., Nor Malina M., Azrina, H.), housing is a huge problem for the billions in the bottom class. House and neighborhood conditions contribute greatly to an individual's quality of life. Findings from survey showed in the paper that some of the major concerns for home buyers are location and cost of the house (especially in urban areas). Majority of respondents felt that cost of urban houses in Malaysia was beyond their budget. After the independence from the British in the year 1957, the Malaysian Housing Policy, emphasis has forwarded from merely providing accessibility to housing, slums and overcrowding to housing with significantly better quality and affordability. In 1960, the focus was on increasing housing ownership. The notion of affordable housing as a basic human need was on the rise. This continued until the year 2000 but included new pieces of the New Economic Policy (NEP) objectives of restructuring salaries and assets between various ethnic groups, especially Malaysians, Chinese and Indians. Majority of affordable housing has been provided by the local government under the public housing programs, even though both the public and private sectors also provide them. In 2011, the price of affordable houses is around RM 25k per unit, however, the cost varies depending on factors such as location, states, urban typologies etc. with targeted buyers of RM 750 per month income (S. Abdul Ghani, and L. M. Lee, 1997). Current housing policies have changed its emphasis from low cost housing to meet the requirements of the middle-income groups, especially the lower middle class. The researchers concluded the paper by discussing the results of their research. Their findings proved that the house purchasing in urban Malaysia is determined by age, education level, gender and income. Findings also showed that some of the main concerns for the buyers were the location and cost of housing, with most stating that the prices were beyond their budget. Other than that, location and distance from work place was also considered as one of the major concerns. However, when it came to satisfaction in terms of sociocultural and religious facilities in the housing area, the respondents seemed quite satisfied with majority of them not taking ethnic diversity as an issue in decision making when purchasing houses.

3 b) Historic Background of adaptable architecture

Even though the term 'adaptable housing' has started to be interpreted in new ways, it is no longer a new and unique idea. Schneider & Till suggest two scenarios for the development of flexible housing in history. The first indicates that development came as a result of evolving conditions in vernacular housing (Schneider & Till, 2012). Vernacular architecture tends to be very adaptable. Usually constructed by hand using local materials, structures can be easily added on to or demolished and recycled naturally. Although adaptability in the form of the vernacular is not exactly applicable to contemporary modern architecture, vernacular architecture offers many ways that a building might naturally evolve over time and expanding to fit its occupants, reducing or gaining layers through different seasons, etc. The second scenario developed in response to external pressures that have prompted designers to create alternative design solutions. This is the contemporary version of adaptability involving architects and other experts. Schneider & Till propose three key drivers in the development of contemporary adaptable housing.

The first phase came about in the 1920's (following the First World War) in response to the need for European social housing programs to provide mass housing for the working class. In order to supply housing to as much of the population as possible, smaller space standards were adopted. Schneider & Till term this phase "modernity and the minimal dwelling," arguing that early modernist architects sought to make these minimal dwellings as functional as possible using elements of adaptable design. Dutch architects such as Johannes van den Broek experimented with changeability of use and it was concluded that due to some rooms went unused for much of the day, these spaces should afford different uses during that time. For example, a bed could fold up to provide additional living room or office space during the day. In the Schröder Huis, designed by Gerrit Rietveld, a complex system of sliding walls and folding screens adapted to suit the daily cycles of the family. The second phase in the evolution of adaptable housing began in the 1930's and was essentially based around the belief that flexible housing could be available to all by means of prefabrication and other emerging technologies.

The third phase began in the 1960's, when the move towards participation and user involvement led to a new interest in adaptable housing as a means of providing user choice. John Habraken recommended the idea of the building of "supports", which consists of the primary structure, the building envelope, circulation spaces, and mechanical systems. These supports can then be in filled by occupants in a systematic order to accommodate a variety of floor plans and features ??Habraken, 1972). Since the era of Supports, Habraken's ideas for residential open building practices are being adopted for use more frequently, especially in Finland, Japan and the Netherlands ??Kendall, 2011).The aim of this literature review is to discuss various opinions and methodologies on the following matters:Various definitions and meanings of adaptability (in context of student accommodation); Effects of adaptability on student's economy, quality of life and satisfaction; Valuable adaptable features to students in their accommodations. Because of evolution in digitalization (Farooq et al., 2018) customers want quality services (Buzdar, 2014; Buzdar, Janjua and Khurshid, 2016) and this applied to all housing related customers.

4 III. Research Methodology

Many international students travel to Malaysia for higher education and stay in the country for only a certain period of time (depending on the duration of their desired course). From the literature given in this paper, we can see that the notion of adaptability in housing makes it abundantly clear that it aims to prevent unnecessary changing of home whenever any new circumstance in life occurs. The idea is that the house itself must adapt to the changing needs of the inhabitants rather than the inhabitants changing their accommodation to meet their newer requirements. From this, we can arrive at the conclusion that it would make more sense if adaptable features in an accommodation are targeted for residents who are planning to stay in that accommodation for a long period of time.

The aim of this research is to look into this matter from students' perspective and to find out whether students (both national and international) require a certain level of adaptability in their student housing or not. As mentioned before, the uniqueness of this matter resides in the fact that most students plan to stay in a student accommodation for the duration of their study period (short term stay) and to find out whether they require adaptive features in their accommodation (which is usually a long-term approach). This paper tried to find the relationship between these two extremes i.e. short term staying of students in an adaptable accommodation.

The research was carried out through data collection and the outcome was compared to various literatures on the topics of student housing and adaptable housing. The data collection was done via questionnaire and an interview. The interview was conducted with an architect, whereas the survey through questionnaire targeted only students living in a chosen adaptable accommodation. Graphs were created to assist in evaluating the survey results in a statistical manner. The site chosen for the research was the Garden Plaza complex located in Cyberjaya, Selangor. The apartment units offer a small level of flexibility and adaptability to the occupants. Also, it is very close to Limkokwing University of Creative Technology, making it popular amongst students of the university to live in.

5 IV. Summary and Analysis of Interview

Society may be reluctant to the idea of adaptability in housing if its cultural and religious beliefs are subject to compromise, even if it results in inefficient use of spaces. Adaptability in housing can be very useful as many people do not plan for later when buying a house. They might not have decided on how many children they will have or whether the idea of divorce of a married couple is on the table (such things are of course difficult to predict). However, based on the response from the interview, adaptability can be a useful solution to combat these unpredictability's in a convenient and efficient manner without needing to make drastic changes such as moving out of the house in search of a better suited one etc. This point is in line with the paper 'Towards Specific Adaptable Housing' (as mentioned in the literature review). Adaptability is one of the solutions to the housing problems but cannot be selected as the main solution. There are simply too many variables to consider and all the issues cannot be solved with just one method. The example of military base in Dhahran Eastern Province can be related to 'the Next Home' project mentioned earlier. The military based used a similar method of cataloging components separately and making use of only those components that are needed at a time, preventing waste and thus, resulting in cost and energy efficiency. Adaptable features may appeal to bachelors rather than families, as families are restricted by cultural and traditional norms.

6 V. Survey Results and Discussion

53% of respondents occupied 3-bedroom units, 20% occupied 4-bedroom units and 27% occupied single bedroom studios, making a total of 73% of the respondents living with housemates and 27% living solo. The reasons of this are most likely financial, as the single bedroom studio is the most expensive for a single student whereas in multi-bedroom units, the rent is shared evenly and the individual costs are lowered. This also tells us that the students are willing to compromise privacy for the sake of finance, as the interior walls are not of full height and therefore, the units are lacking sound privacy 35% of the respondents are highly satisfied with the adaptable features, 52% are with a medium satisfaction level, making a total of 87% of happy and satisfied occupants. This number shows that the majority of these students are happy with the adaptable features. This fact can be

related to the 5th pie chart, which showed that the overall majority of the respondents (87%) will be staying for not more than 2 years, whereas only a minority of 13% will stay from 3 to 4 or more years. This shows that out of all the respondents, 87% were happy with the adaptable features and also, 87% were staying for a short-term period (i.e. not more than 2 years). This result answers the third research question; almost 90% of the surveyed students, living in the adaptable accommodation for a short period, do utilize the adaptable features given to them and in fact, want more features as per pie chart 4,

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where the majority wished for higher adaptability levels in the units.

60% of the students receive not more than RM 2000 allowance per month and 75% of them are undertaking Bachelor degree level courses, which is a full-time course for majority of universities in Malaysia (as supported by a website called [www. Bachelor studies.com](http://www.bachelorstudies.com) where only two universities are shown to offer part-time bachelors programs in the country). This means that majority of the students surveyed receive allowance that can be classified as middle-class income. This is based on the website called www.quora.com that classifies middle income class's starting salary for graduated employees to be RM 2000 (Rashid Mohamed, 2015). Furthermore, based on graphs from answer 6, 26 out of 40 respondents rated the rent as either 'Excellent' or 'Good'. These statistics prove that majority of the students are able to live in the Garden Plaza, a relatively adaptable accommodation, with mid-class income.

We saw that majority of respondents (40%) found the given adaptable features to be very useful in case an extra member wants to stay over or move into the unit, whereas 35% believed that the features would provide medium level of usefulness. This shows that 75% of the respondents found the features to come in handy when a new member wants to join the unit. As mentioned earlier in the description of Garden Plaza, many rooms have features or situations where the air conditioners and televisions can be shared between rooms (due to revolving wall partitions and partition walls that are not of full ceiling height). This can conclude that students are allowed to tailor scenarios where they can cut costs by compromising on some factors. This conclusion answers the first research question; adaptable features offered in the Garden Plaza can have a positive impact on the occupant's financial situation, however, it depends on how the adaptable features are utilized by the occupants.

Majority of the respondents can be seen to rate factors that can determine a student occupant's wellbeing such as 'flexible layout', 'neighborhood', 'security', 'unit size' and 'rent' as 'Good'. This shows that all of those students living in Garden Plaza were fairly happy with these factors and thus, willing to continue staying there for their academic period. In a way, this data complies with the survey from the paper 'Room and board Redefined: Trends in Residence Halls' (www.hermanmiller.com, 2007) mentioned in the literature review, in the sense that both data show similarity in student's importance to residential facilities. The results from with another paper called 'Well-Being of UiTM Shah Alam Students Living in Off-Campus Environment' (Muslim, Abdul Karim, Abdullah 2013), where It was found that 'living conditions' was the second highest off-campus environment area mentioned by students, thus, showing that comfort is an important factor. Based on the analysis of the survey results, we have the answer to the second research question; the quality of student's life can be improved if sufficient, relevant and useful adaptable features are provided to the students, along with cost efficient solutions.

8 VI. Conclusion

The results from the survey can be seen to go against the usual notion of adaptability; that it serves as an important feature for occupants who wish to inhabit an accommodation for life. This paper, based on userpreference, has proven that students staying for a shortterm duration, for the sole purpose to fulfill their higher educational period, do appreciate and utilize the adaptable features when offered as a part of their accommodation. This changes the way we think about adaptability in any sort of accommodation. It is not merely a tool to increase the life of a building or 'recycle' the functionality of a given space in various ways but can also be used as an efficient tool to for those who wish to stay in an adaptable accommodation for a short period of time. For students who struggle financially and otherwise, it can prove to be an important asset in their daily lives, as adaptable features do allow them to have a controlled level of flexibility that they can manipulate based on their requirements. ^{1 2}

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Figure 1:

- [House et al.] , Random House , Dictionary , Unabridged . <http://dictionary.reference.com/browse/adapt>
- [Kendall and Teicher ()] , Stephen Kendall , Jonathan Teicher . *Residential Open Building* 2000.
- [Dcsf and For ()] , Department Dcsf , Crown For . <http://www.dcsf.gov.uk/> 2006. UK, 2010. Douglas, J, Building Adaptation: Elsevier Ltd. (2nd edition, Great Britain)
- [Blakstad ()] *A strategic approach to adaptability in office buildings, Doctor of Architecture*, Siri H Blakstad . 2001. Norwegian University of Science and Technology
- [Adaptable Features in a Student Accommodation: A Case Study from Malaysia Global Journal of Researches in Engineering ()] *Adaptable Features in a Student Accommodation: A Case Study from Malaysia Global Journal of Researches in Engineering () Volume XVIII Issue II Version I*,
- [Gelís ()] ‘Adaptable workplaces’. J Gelís . *Building Operating Management* 2000.
- [Hoberman and Schwitter ()] *Adaptive Structures: Building for Performance and Sustainability, Design Intelligence*, C Hoberman , C Schwitter . www.di.net/articles/archieve/2881/ 2008.
- [Filion and Bunting ()] *Affordability of housing in Canada, Supply and Services Canada*, P Filion , T E Bunting . 1990. Ottawa.
- [Van Der Voordt and Van Wegen ()] *Architecture in Use*, T Van Der Voordt , H Van Wegen . 2005. Netherlands: Architectural Press.
- [Mesghali ()] *Biomimetic Shading Techniques of the Esplande Theatre*, Ehsaan Mesghali . <http://biomimetic-architecture.com/2010/11/28/biomimetic-shading-techniques-of-the-esplande-theatre/> August 14, 2011. 2010.
- [Blue Mountains: Better living DCP ()] *Blue Mountains: Better living DCP*, 2005. Blue Mountains City Council, Australia.
- [Bullivant ()] Lucy Bullivant . *4dspace: Interactive Architecture, Architectural Design*, 2005.
- [Census highlights as released by The Daily, Statistics Canada, Catalogue no. 96-304E Statistics Canada ()] ‘Census highlights as released by The Daily, Statistics Canada, Catalogue no. 96-304E’. *Statistics Canada* 1991. 1994.
- [Graham ()] *Design for adaptability -an introduction to the principles and basic strategies, The Royal Australian Institute of Architects*, P Graham . 2005. Australia. 66.
- [Hashemian ()] *Design for adaptability, Doctor of Philosophy*, M Hashemian . 2005. University of Saskatchewan
- [Danko ()] *Designing Affordable Housing for Adaptability: Principles, Practices, & Application, Pitzer Senior Theses*, Micaela R Danko . 2013. 2013. California.
- [Croxtton and Record (2003)] *Designing for Disassembly and Deconstruction, Architectural Record*, Architectural Croxtton , Record . October 2004. August 2003. p. 147. (cited by Knecht)
- [Ridder and Vrijhoef ()] *Developing A strategy for 'living buildings': Beyond cradle to cradle with living building concept*, H Ridder , R Vrijhoef . 2008. Cardiff, UK.
- [Bharatkumar ()] *Dissertation Flexible Architecture, Fourth year publication -School of planning and Architecture*, Aishwarya Bharatkumar . https://issuu.com/ashbk/docs/dissertationflexible_architecture 2013. New Delhi.
- [Allan and Butlin ()] *Families in Canada, Statistics Canada and Prentice Hall Canada Inc., Catalogue no. 96-307E*, Che-Alford , J Allan , C Butlin , G . 1994. Ottawa.
- [Kronenburg ()] *Flexible Architecture that responds to change*, R Kronenburg . 2007. London: Laurence King Publishers.
- [Leaman and Bordass ()] ‘Flexibility and Adaptability’. A Leaman , B Bordass . *Designing better buildings*, S Macmillan (ed.) 2004. Spon Press. p. .
- [Seyed Reza Hosseini Raviz, Ali Nik Eteghad ()] ‘Flexible Housing: The Role of Spatial Organization in Achieving Functional Efficiency’. <http://archnet-ijar.net> *International Journal of Architectural Research* Seyed Reza Hosseini Raviz, Ali Nik Eteghad (ed.) 2015.
- [Guideline for design for disassembly and adaptability in buildings Canadian Standards Association ()] ‘Guideline for design for disassembly and adaptability in buildings’. *Canadian Standards Association* 2006. p. . CSA
- [Habraken ()] N J Habraken . *Supports: An Alternative to Mass Housing*, 1999. Urban Press. (2nd ed)
- [Homes ()] W G Homes . <http://www.Youtube.cocm/watch?v=Lg9qnWg9kak> *A Tiny Apartment Transforms into 24 Rooms*, 2011.
- [Cooper-Marcus and Sarkissian ()] *Housing as if people mattered: Site design guidelines for medium-density family housing*, C Cooper-Marcus , W Sarkissian . 1986. Berkeley: University of California Press.

- [Mohamed ()] ‘How will you classify salaries in Malaysia as middle class, upper middle class, and higher class with respect to financial stability?’. Rashid Mohamed . <https://www.quora.com/How-will-you-classify-salaries-in-Malaysia-as-middle-class-upper-middle-class-and-higher-class-with-respect-to-financial-stability> 2015.
- [Lifetime Homes, Consultation on Proposed Revisions to the Lifetime Homes Criteria ()] *Lifetime Homes, Consultation on Proposed Revisions to the Lifetime Homes Criteria*, www.lifetime.org.uk 2009.
- [Ghani and Lee ()] *Low Cost Housing in Malaysia*, S , Abdul Ghani , L M Lee . 1997. Kuala Lumpur: Utusan Publications & Distributors Sdn. Bhd.
- [Organization for Economic Co-operation and Development, Providing for future change: Adaptability and flexibility in school bu] *Organization for Economic Co-operation and Development, Providing for future change: Adaptability and flexibility in school building*, 1976. Paris: OECD.
- [Palmer ()] Jasmine Palmer . <http://www.yourhome.gov.au> *The livable and adaptable house*, (Australia) 2013. Australian Network for Universal House Design
- [Gurstein ()] ‘Planning for tele work and home-based employment: A Canadian Survey on integrating work into residential environments’. P Gurstein . *CMHC* 1995.
- [Schmidt et al. ()] Robert Schmidt , Iii , Toru Eguchi , Simon Austin , Alistair Gibb . <http://adaptablefutures.com> *What is the Meaning of Adaptability in the Building Industry*, (UK) 2011.
- [Schneider and Till ()] Tatjana Schneider , Jeremy Till . *A Few Thoughts: Flexible Housing*, (Taylor & Francis, England) 2012.
- [Statistics Canada, Catalogue no. 91-213 Statistics Canada, Annual demographic statistics ()] ‘Statistics Canada, Catalogue no. 91-213’. *Statistics Canada, Annual demographic statistics* 1994. 1995.
- [Summary of Working Group Meeting on Housing and the Environment ()] *Summary of Working Group Meeting on Housing and the Environment*, (Ottawa) 1995. National Housing Research Committee (NHRC)
- [Friedman ()] *The Adaptable House: Designing Homes For Change*, A Friedman . 2002. McGraw-Hill, US.
- [Fletcher ()] ‘The Commission for Architecture and the Built Environment’. Howard Fletcher . www.cabe.org.uk *The principles of inclusive design (They include you)*, (London) 2006.
- [Friedman and Krawtitz ()] ‘The Next Home’. Avi Friedman , & David Krawtitz . <http://www.tandfonline.com> *Housing & Society Journal* 1998. Montreal. 25. (Issue 1 & 2)
- [Friedman et al. ()] *The Next Home, McGill School of Architecture Affordable Homes Program*, A Friedman , D Krawitz , J Frechette , C Bilimoria , D Raphael . 1996. Montreal.
- [Room and Redefined ()] *Trends in Residence Halls*, Board Room , Redefined . <http://www.Hermanmiller.com/research/research-summaries/room-and-board-redefined-trends-in-residence-halls.html> 2007.
- [Salfarina et al. ()] ‘Trends, Problems and Needs of Urban Housing in Malaysia’. A G Salfarina , M Nor Malina , H Azrina . <http://waset.org/publications/7521/trends-problems-and-needs-of-urban-housing-in-malaysia> *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering* 2011. 5 (2) .
- [Gorgolewski ()] ‘Understanding how buildings evolve’. M Gorgolewski . *Paper presented at The 2005 World Sustainable Building Conference*, (Tokyo) 2005.
- [Juneja and Roper ()] *Valuation of adaptable workspace over static-workspace for knowledge organizations, Paper presented at The Construction and Building Research Conference of the Royal Institution of Chartered Surveyors*, P Juneja , K O Roper . 2007. Georgia Tech, USA.
- [VMDO, Student housing design ()] https://issuu.com/vmdoarchitects/docs/vmdo_student_housing_design *VMDO, Student housing design*, 2016.
- [Muhammad Hilmy Muslim, Hafazah Abdul Karim, Ishak Che Abdullah ()] ‘Well-Being of UiTM Shah Alam Students Living in Off-Campus Environment’. *Asian Journal of Environment-behaviour Studies* Muhammad Hilmy Muslim, Hafazah Abdul Karim, Ishak Che Abdullah (ed.) 2013. 4. (Number 13, fspu.uitm.edu.my)
- [Senbel ()] *Working at home and sustainable living: Architecture and planning implications*, M Senbel . 1995. Montreal. McGill University (Unpublished M.Arch. Thesis)
- [Zee ()] Emma Zee . <http://researcharchive.vuw.ac.nz> *Towards Specific Adaptable Housing*, (Wellington) 2013. (Master Theses)