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Content Validation of the User Attitudinal Component and Factors in Green Building

Izran Sarrazin Mohammad
Department of Real Estate, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia.
Email: izran@utm.my

Tsau Kar Yen and Rohaya Abdul Jalil
Department of Real Estate, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia.

ABSTRACT

The green building performance gap has been well acknowledged in building industry and one of the contributors to these issues is the behaviour of users in the building. One of the element that influences the behaviour of users is the attitude of the user towards the building environment. The consideration of the human aspects especially the user attitudinal component and factor is essential as an approach in improving the building performance. This paper aims to identify the user attitudinal component and factor from the literature and to validate the research instrument by using the content validation method. The procedure of content validity include the conceptualization and development of instrument throughout an extensive literature review and to validate the relevance of the user attitudinal component and factors to be considered in green buildings. Three user attitudinal components and seventeen factors were developed from the extensive review of the literature. Ten experts were chosen to appraise the instrument of research by using a quantitative content validation. Fifteen items were accepted as relevant to the study within the accepted range and two items were eliminated from the research instrument. The study's output allows the building industry a new insight on what user attitudinal aspect to be considered and integrated when dealing in the development of green building. The output of this study greatly benefits the building designers and managers when designing, constructing and managing green buildings.

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Corresponding Author's Contact:

kytsau1989@gmail.com

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1. Introduction

Green buildings are hugely important in safeguarding the future of next generation due to its ability to mitigate the side effects of man-made pollutants and enhance the condition of the environment. In Malaysia, the development of green buildings is aggressive and much attention is putting in. The government has propelled its green building program and policies by presenting the green rating tools, which is Green Building Index (GBI) so as to advance and thrive the building business with green building innovations. To date, according to the GBI executive summary as of 31 July 2019, 507 buildings have certified as green and the sum is anticipated to upsurge in the coming years. As indicated in the GBI executive summary, there are 261 non-residential new construction, 195 residential new construction, 16 industrial new construction, 16 non-residential existing

building, 4 industrial building, 2 interior and 13 township GBI projects in Malaysia as for now.

Many green building performance have been reported in studies. However, the results have shown contradiction to what has expected. This can be seen from De Wilde's (2014) study reported that a substantial distinction occured between the estimated energy performance and the actual energy use during the operation of buildings. He highlighted the starting point of the performance gap are come from the design, construction and building operation phases (Menezes et al., 2012; De Wilde, 2014; Salehi et al., 2015). Salehi et al. (2015) reported the energy consumption of green building is 60 per cent greater than what has predicted. Scofield (2009, 2013) also discovered that in comparison with non-LEED buildings, LEED-certified buildings failed in saving energy use and reduced emissions of greenhouse gas. Davies and Oreszczyn (2012) showed that several Britain green buildings do not achieve the expected good quality of indoor environment. The main factor was these buildings commonly used envelope (door or window) that are high airtightness to save energy, conversely, it has risen the risk of poor indoor air quality as well as overheating problems during the transition of seasons. Lin et al. (2016) looked into the actual energy usage in 31 green buildings from China in various climate regions. The research disclosed that the energy consumption of the green buildings was considerably lower than conventional buildings when it was in Hot-Summer Cold-Winter region for building type A. There is no dissimilarity of energy consumption between green and conventional buildings in building type B in all climate regions. Moreover, the type A and B buildings in Hot-Summer Cold-Winter region are discovered 15% to 23% of average energy usage lesser than the upper limits of the Chinese standard. Similarly, in Malaysia, according to Ng (2013) and Suzaini et al (2017), Malaysian green office buildings used a large quantity of energy because of construction, poor building design, management policies and behaviour of the occupants. Research by Suzaini et al (2017) reported that Malaysian green buildings devour higher energy compared to the conventional office. The researcher further asserted that the chosen non-residential GBI-certified buildings are performed superior to the simulated or intended energy performance which is on average 111 kWh/m2 annually and it was intended devouring 150 kWh/m2 every year. Notwithstanding, due to the conventional non-GBI certified buildings has the relative contextual analysis with the GBI-certified buildings, the traditional buildings were performing superior to the GBI-rated buildings at 69 kWh/m2 every year (Suzaini et al., 2017).

The behaviour of users have reported as one of the causes of the performance gap of green buildings. This is in line with Martinaitis et al. (2015) and Schakib-Ekbatan et al. (2015) studies, claiming the user behaviour is the main contributor to the performance gap especially in energy usage. User behaviour is how an individual act with the building control systems. It is the interaction between the human and building in controlling the opening of windows and blinds, lighting, air conditioning and ventilation system (Balvedi et al., 2018) to pursuit environmental comfort (Yan and Hong, 2013). Further, according to Menezes et al. (2012); Chen et al. (2015); Martinaitis et al. (2015), the behaviour of user can enormously impact the utilisation of energy. As what has referenced by Janda (2011), 'buildings do not utilize energy, yet the human do'. The building system such as air-conditioning, electrical equipment and lighting that utilized and control by the users to deal with their comfort could subsequently cause a huge amount of energy use (Harish and Kumar, 2016).

The behvaiour of the user would not happen without a reason. It can be influenced by their attitude towards the environment of the building when they occupying in the building. According to Fabi et al (2011), attitudes impact the user's behaviour directly and indirectly. For example, when a person is allocated in the building, the features in the environment of the building such as spatial allocation, lighting, colour, indoor air quality, indoor environment, noise, thermal comfort and user control of space can have profound effects on how the users perceive the attitude in the environment because the features of the environment could influence an individual's cognitive reaction (Kolvir & Domola, 2015) and influence their behaviour in the building.

Meanwhile, previous studies have shown the building design can influence human minds, attitudes and behaviours. According to Ruskin (1989) cited in Wu et al (2015), the building design could impact the human mind, conditions their psychological and shape their behaviour (Roth, 1993). Further, Ragsdale (2011) claimed that the building elements can influence the attitudes and behaviours of the user. For instance, the ambient characteristics in an office environment shows that temperature, noise, lighting could influence the user attitude towards the environment of building and this could impact on their behaviour in attaining comfort. Besides, Adrian Laeman (1995) stated that an indiviual who are not happy with the room temperature, water quality, lighting and noise conditions in their offices are more likely to affect their concentration at work. This situation would influence their attitude towards the building and subsequently affecting their behaviour in the building. Another example could be seen from Relf (1990) claiming that the interaction with plants (building features) in the building, both passive and active can alter human attitudes, behaviours, and physiological responses.

However, considerably less research has evaluated the green buildings with respect to the attitudes, behaviour and value (O'Callaghan and Hyde, 2011). It is important to consider the user's attitude in green buildings as their behaviours response to the environment of green building is based on their perceptions and attitudes of the building. By understanding the component and factors that influence the user's attitude, the designers can know how the user think, feel and behave and this may help to improve the overall building performance. One common scenario can be seen from a relatively old study is the infamous "pink prison experiment", which concluded that the temper of the prisoners were soothed when they were placed in the pink-walled cells (Schauss, 1979). This discovery became so famous and commonly recognized that the prison cells in Canada and the USA were painted in bright pink colour as well. The colour of the prison creates a positive attitude to the inmates which

helps to soothe their mood and behave tamer. As such, the design of the green building needs to make an attempt at personalizing the attitude of the user by undertstanding how they feel, think and behave in the building. For instance, the building systems display in green building that highlight the perceived attitude of users would impact the users acting in a behaviour that increase the performance of the green building. By addressing the attitude of the individual, it will result in a change of behaviour on the use of the facility in green building.

Therefore, it is crucial to consider the attitude of the user in a green building. By identifying the user attitude component and factors to be considered, this could add a new dimension of knowledge to understand how the users' attitude can impact their behaviour and how the consideration of users' attitude could improve the green building performance. However, to date, there is still a shortage of empirical data for user attitudinal consideration in the green building where current green building developments are mostly focused on the environmental (natural resources) and economic (cost) aspects. There is still a lack of research on the social point of view where the consideration of user's attitudinal aspect in the green building could give designers a holistic point of view on what to consider about the human in the perspective of psychological when developing green buildings. Despite prior research, the balance between design and the aspect of user attitude is inadequately understood and remains vague. Moreover, given that the user behaviour can be influenced by the user attitude towards the environment of building and there are lacking of studies attempt to study what are the factors that influence the attitude of user, thus, this research aims to identify the factors that influence the attitude of user in green building and to validate the attitude factors by using content validity method.

2. Content Validity

Content validity is the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose (Haynes et al., 1995, p. 238). A content validity assessment is needed to be conducted to validate the reliability of the new construct in research (Rubio et al., 2003). This is to ensure the research construct is related to the field of research. The construct's wording or explanation which is long or hard to understand or not applicable to the research studies may lead to lower response rates and have a tendency to produce inaccurate responses (Rubio et al., 2003). Thus, the content validation process should be conducted carefully. Many studies from various scholars such as Delgado-Rico et al., (2012), Zamanzadeh et al., (2015), Paul et al., (2016) and Vasli et al., (2018) have used content validity studies as part of the development of their research tools.

The content validy relatively begins with the development of instrument and judgment by the expert of panel (Lynn, 1986). Hence, the domain of the content linked to the phenomena of interest is first identified from a comprehensive literature review to generate the instrument items that linked to the identified content domain (Carmines and Zeller, 1979; Lynn, 1986). Eventually, a list of expert panels is chosen to judge the developed instrument (Lynn, 1986). The instruments will then be evaluated to quantify the robustness of the item in the context of the study by the selected panel of experts (Wynd et al., 2003). Usually, the evaluation process follows the process of establishing potential items to be added in the research instrument (Gilbert and Prion, 2016). This entire process will serve as the item's pre-test evaluation. Therefore, any information on the clarity and representative of the item will be produced by conducting a content validity study.

2.1 Rules of Thumbs of Conducting Content Validity

Consideration should be given to proper rules and procedures when conducting a content validity study. The instrument items are first assessed by the expert panel and the total content validity score is obtained from the Content Validity Index (CVI) score. For items that achieve a low CVI value, it indicates that the items are not useful in describing the main construct due to insufficient specifications for the construct or insufficient expertise in the judging process (Polit et al., 2007). The items deemed conceptually unreliable and therefore, will be omitted (Hinkin, 1998).

Typically, the common scale used in the content validity ratings is the 4-point scale (Lynn, 1986). Lynn stated that 3 or 5 point scales could be used. However, the most recommended scale is the 4-point scale to prevent neutral and equivocal midpoint (Lynn, 1986). Many labels were suggested for the 4-point rating scales in previous studies. The researchers indicate that the ratings of 1 and 2 are "invalid content", whereas 3 and 4 are "valid content" (Orts-Cortes et al, 2013; Parsian and Dunning, 2009; Wynd, Schmidt and Schaefer, 2003; Yaghmale, 2003; Waltz, Strickland and Lenz, 1991).

In addition, the success of the content validity study is largely dependent on the quality of the selected experts rather than their number. Selecting an appropriate list of panellists to participate in the validation process is very important because the study results are usually based on their views on the research content. The number of experts rely on the availability and willingness of experts to participate andit is usually conducted by more than seven experts (DeVon et al., 2007; and Parsian and Dunning, 2009). According to Yaghmale (2003), Five to ten experts are appropriate while Lynn (1986) advised at least three experts and said not more than ten.

The CVI has been used to quantify each item in the research instrument. There are two methods used to determine the content validity score include the score of item-level (I-CVI) and the score of scale-level (S-CVI). I-CVI refers to the content validity per item. It describes a percentage of the panel of experts with a rating of 3 or 4 as an indicator of agreement with the items. In the meantime, S-CVI refers to the entire instrument's content validity (Polit et al., 2007). The S-CVI is determined not to focus on the level score (I-CVI) of each item, but to identify the index for the content validity of the overall scale. The proportion of the agreement on the relevance of each item (I-CVI) ranges from 0 to 1 (Lynn, 1986) and the acceptable

S-CVI value is 0.8 or higher (e.g., Davis, 1992; Grant & Davis, 1997; Polit & Beck, 2004).

It is considered acceptable that the item scored more than 0.78 to 1.0 in I-CVI (Polit et al., 2007). In order to account for the expert agreement, the scores are then transformed to modified kappa value. The modified kappa value was interpreted by Landis and Koch (1977) in six categories. For example, a modest kappa value of less than 0 means no agreement, a value between 0.01 and 0.20 is slight agreement, 0.21 to 0.40 is fair agreement, 0.41 to 0.60 is moderate agreement, 0.61 to 0.80 is substantial agreement and 0.81 to 0.99 is almost perfect agreement (Viera & Garrett, 2005). In the study conducted by Banerjee, Capozzoli, McSweeney and Sinha (1999), the values above 0.75 is an excellent agreement; values between 0.40 and 0.75 are fair and good agreement; and value below 0.40 is poor agreement. However, on the basis of the latest study carried out by Orts-Cortes et al. (2013), Fleiss (1981) mentioned that the value more than or equal to ≥0.74 is considered excellent, 0.60 to 0.73 is considered good, 0.40 to 0.59 is considered moderate or weak and less than or equal to ≤0.39 is considered poor.

3. Methodology

3.2 The Process of Content Validation

The content validity for this paper was conducted in five steps (Figure 1). The development of instruments and item first develops through an extensive literature review. Questionnaires are prepared and the panel of experts review and evaluate the research instrument. A content validation analysis is performed to determine the relevance of the research instrument constructed.

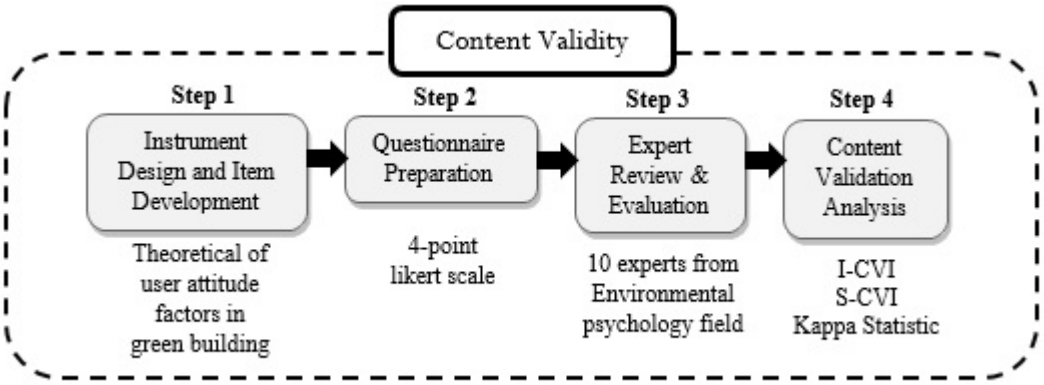

Figure 1 The process of content validation

3.2.1 Instrument Design and Item Development

The identification of the domain of content, item generation and instrument construction (Zamanzadeh et al.,2015) was done before the content validation starts. Based on the literature review, the components and user attitude factor were identified where the factors were divided into a few component categories to clearly represent the study's objective. A total of three attitude components and 17 factors were identified from the literature (refer to Table 2).

3.2.2 Questionnaire Preparation

The questionaire for the content validity was designed to validate the items obtained from the literature review, where questions were divided into a few categories to clearly represent the objective of this study. The questionaire includes of theree sections. The first sections is regarding the respondent's background. The second section is the respondent's opinion on the relevance of the user attitude factors in each components respectively. There are three components which include affective, behavioural and cognitive components where the user attitude factors are underlying in each components. The last section of the questionnaire is the respondent's comment and suggestion. This content validity questionnaire was developed using a four point Likert scale to prevent a neutral and ambivalent midpoint (Lynn, 1986). A numerical value is assigned to each level on the scale. This useually starts from 1 and increases for each level by one. The label for each point of scale used is 1= not relevant; 2= least relevant; 3= relevant; and 4= very relevant. The likert scale is only used in the second section of the questionnaire while the first and last section were open ended question.

3.2.3 Expert Review and Evaluation

The success of a Content Validity study depends largely on the quality of the selected experts rather than their number. It is very important to select a list of panelists to engage in the validity process because the study results are usually based on their views on the content of the research study. The number of experts relies on the availability of experts and their willingness to participate. The validity of the content is usually carried out by more than seven professionals (DeVon et al., 2007; and Parsian and Dunning, 2009). Yaghmale (2003) mentioned five to ten experts are appropriate. Lynn (1986) cited in Wynd,

Schmidt and Schaefer (2003) advised at least three experts and stated that ten is unnecessary.

Regarding the standards for the selection of Content Validity experts, some essential characteristics are to be considered. According to Shanteau, Weiss, Thomas and Pounds (2003), the requirements such as experience, certification, social acclamation and factual knowledge are needed to be taken into account when selecting an expert. The researcher adopted the expert requirement for this research based on the study by Skulmoski et al. (2007), namely knowledge and experience in this research area; willingness and sufficient time to engage and efficient interpersonal skills (Adler and Ziglio, 1996).

The researcher identified the number of experts in the field of environmental psychology by using judgmental sampling as the potential population for content validity. It is reasonable to use a judgmental sampling method since the experts have been selected for the perceived expertise in the subject, which they can contribute to the research area to obtain the anticipated valid result (Hatcher and Colton, 2007). Experts must be selected from stakeholders with relevant knowledge and experience in the study.

The selected experts were first contacted by electronic mail to obtain their consent to the participation in the survey. Among the experts, ten were agreed to engage in the content validation. The experts were experienced and well-performed in the field of environmental psychology and were asked to specify whether the item is relevant to the research and to mark each item from 1 to 4 with a 4 point scale range. The detail of the experts is stated in Table 1. Due to the interest of respondents, the name of the respondents is not revealed in this paper.

Table 1 Background of Experts

Panel of Expert	Contribution/ Experience
R1	An experienced environmental psychologist incorporating important psychological considerations into the design of places and objects.
R2	An environmental psychologist. Work in a wide range of environment-behaviour studies including the role of the learning environment in the educational process, environmental design within healthcare environments, predictors of pro-environmental behaviour and public participation in environmental design.
R3	Specializes in studying the reciprocal nature of well-being results from nature-based activities and achievements in extreme environments.
R4	Specialized focuses are on the structure, content, and role of psychological constructs such as human values, psychological time, self-construal and pro-environmental attitudes, and how they affect behaviour; and on a policy-based study to encourage ecological behaviours, health and well-being.
R5	Specialized in urban design and environmental psychology such as walkable environments, livable public spaces, and restorative urban places.
R6	Specialized in the interface of social, environmental, and personality psychology. Develops instruments to evaluate environmental, personality, and social constructs to incorporate these concerns into research that advance theory and enhance built and natural environments simultaneously.
R7	Specialized in social influence, persuasion, human judgment and decision-making, the psychology of risk and communication, and human-environment interactions.
R8	Specialized in cognitive neuroscience, cognitive psychology and cognitive science.

R9	Specialized in personnel psychology (Tests, Measurement and psychological assessment especially personality testing in personnel, competency and performance management) and organizational psychology (personality and organizational behavior especially in leadership, motivation and self-efficacy).
R10	Specialized in environmental psychology focusing in urban environmental performance simulation, the relationship between urban open space planning and community place attachment, and architecture and urban design.

3.2.4 Content Validation Analysis

3.2.4.1 I-CVI Computation

The experts were required to evaluate the relevance of each attitudinal factor in the Malaysian context. The scales for measuring relevancy were 1 = not relevant, 2 = least relevant, 3 = relevant and 4 = very relevant. The I-CVI is quantified based on the methods described in the study by Polit et al. (2007)). The S-CVI was computed by averaging the item-level CVIs. Many scholars have pointed out that the acceptable value for S-CVI is 0.8 above (e.g., Davis, 1992; Grant & Davis, 1997; Polit & Beck, 2004).

$$\text{I-CVI} = \frac{\text{Number of experts scoring an item with 3 and 4}}{\text{Total experts}}$$

3.2.4.2 Modified of Kappa Statistics

The modified of Kappa statistics is the proportion of remaining agreement following the removal of a chance agreement (Wynd et al., 2003). This is to make sure the collected data represent the measured variable, requiring rater reliability (McHugh, 2012). In order to increase certainty in the content validity of new instruments, Bennan (1992) recommended that both the proportion agreement (CVI) and the Kappa statistics are reported as a manifestation of data variability and as an agreement measure while considering the chance agreement (Bennan, 1992). A Kappa statistical test was conducted by inserting I-CVI into the modified Kappa statistic equation to adjust the changes to the agreement ratings by an expert panel (Polit et al., 2007). This study used the kappa value categorized by Fleiss (1981). The modified kappa value below 0.60 is classified as weak and can be considered as 'potentially problematic items' (PPI) and will be removed from the research tool. The probability of chance agreement by binomial random variable (*pc*) was calculated using the equation below. The value obtained was subsequently inserted into the next equation in to calculate the modified Kappa score (*k*):

$$pc = \frac{([N!])}{([A!](N\text{-}A)!])} \times 0.5^{N}$$

where:
N= number of experts; and
A= number of agreements rating 3 or 4

$$k = \frac{I\text{-}CVI\text{-}pc}{1\text{-}pc}$$

where:
pc= probability of chance agreement
I-CVI= content validity on item level

4. Result and Discussion

Three user attitudinal components and seventeen factors were found through a comprehensive literature review. Table 2 shows the output of the user attitudinal components and factors from the literature.

Table 2 The Output of the User Attitudinal Component and Factor

User Attitude Component	User Attitude Factors	References
Affective	Emotion and Mood	Šujanová et al. (2019); Gene-Harn et al.(2016); Totterdell & Niven (2014); Hume (2012); Küller et al (2006)
	Preference	Šujanová et al. (2019); Lee at al. (2019); Carpino et al., (2017); Gene-Harn et al. (2016); Martinaitis et al (2015); Jazizadeh et al. (2014); Gao and Keshav (2013)
	Motivation	Pereira & Ramos (2019); Delzendeh et al. (2017); Durmaz (2014); Wolfe et al. (2014)
Behavioral	Habit	Naspi et al. (2018); Hansen et al. (2018); Stazi (2017); Chang et al. (2017); Wolfe et al. (2014)
	Involvement	Valle et al. (2018); Pan et al. (2017); Lazarova-Molnar & Shaker (2016); Feng et al.(2015); Fried (2014); Gupta & Chandiwala (2010); Prindle (2010)
	Interaction	Baldi et al. (2018); Paone & Bacher (2018); Lallanne, D. (2016); Langevin et al. (2015); Thomsen et al. (2013)
	Culture	Paone & Bacher (2018); Delzendeh et al. (2017); Opoku (2015); Barzegar & Heidari (2014); Mansour & Radford (2014); Brown (2009)
	Control	Sadick & Issa (2017); Day & Gunderson (2015); Heydarian et al. (2015); Altomonte & Schiavon (2013)
Cognitive	Belief	Blay et al. (2019); Wu et al. (2017); Veitch & Gifford (1996); Eagly & Chaiken (1993)
	Perception	Durmaz (2014); Aye et al. (2005); Gou & Siu-Yu Lau (2013); Brown and Cole (2009); Monfared & Sharples (2011)
	Learning	Xiong et al. (2018); Jamaludin et al. (2017); Khalil et al. (2011)
	Persuasion	Fabi et al. (2017); Wu et al. (2017); Wolfe et al. (2014); Wu (2015); Larsen et al. (2010); Schott et al. (2012)
	Attention	Bayer et al. (2017); Lee & Wohn (2016); Wu (2015)
	Memory	Jahncke et al. (2011); Roelofsen (2008)
	Information	Fabi et al. (2017); Hauge et al. (2011); Wolfe et al. (2014); Kulatunga et al. (2006)
	Personality	Schweiker et al. (2016); Hellwig (2015); Berglund & Gidlöf (2000)
	Social norm	D'Oca et al. (2017); Mulville et al. (2017); Anderson (2015); Tetlow et al. (2012)

The content was validated by the selected experts involved in the field of environmental psychology and the content results were shown in Table 3. A majority of experts rated each factor as relevant to the study. 3 out of 17 factors (emotion and mood; preference; habit) received a high level of I-CVI scores (I-CVI= 1). Out of the 17 factors, 8 factors (motivation; control; belief; perception; social learning; information; personality; social norm) scored I-CVI of 0.9 and 4 factors (involvement; social interaction; culture) scored I-CVI 0.8. However, there are two factors (attention; memory) were reported with a low level of I-CVI 0.60, showing that this item had no significant relevance as a factor to be considered in green building. The acceptable level to be considered as high relevancy is between 0.78 and 1.0 (Polit et al., 2007). The 1.0 score denotes unanimous agreement with the items relevant to the scope of the study by all the expert panel.

Table 3 I-CVI Score

Attitudinal Component and factor	**Expert agreement**										**Total agreement**	**I-CVI**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Affective												
Emotion and mood	/	/	/	/	/	/	/	/	/	/	10	1
Preference	/	/	/	/	/	/	/	/	/	/	10	1
Motivation	/	/	/	/	/	/	/	/	/	x	9	0.9
Behavioural												
Habit	/	/	/	/	/	/	/	/	/	/	10	1
Involvement	/	/	x	/	/	/	x	/	/	/	8	0.8
Interaction	/	/	/	/	/	/	x	/	x	/	8	0.8
Culture	/	/	/	/	/	/	x	/	x	/	8	0.8
Control	/	/	/	/	/	x	/	/	/	/	9	0.9
Cognitive												
Belief	/	/	/	/	/	/	/	/	x	/	9	0.9
Perception	/	/	x	/	/	/	/	/	/	/	9	0.9
Learning	/	/	/	/	/	/	/	/	x	/	9	0.9
Persuasion	/	/	/	x	/	x	/	/	/	/	8	0.8
Attention	/	/	x	/	/	x	x	/	x	/	6	0.6
Memory	/	/	x	x	/	x	/	/	x	/	6	0.6
Information	/	/	/	x	/	/	/	/	/	/	9	0.9
Personality	/	/	/	/	/	/	/	x	/	/	9	0.9
Social norm	/	/	/	/	/	/	/	/	x	/	9	0.9
S-CVI												0.85

Furthermore, in Table 4, the modified Kappa statistical scores were shown to demonstrate the ability of this instrument to be free from the response bias on the agreement that is likely to happen by chance. The evaluation is based on the standard recommended by Cicchetti (1984) and Fleiss (1971) as highlighted by Wynd et al. (2003). Only two factors (attention; memory) were considered weak and the rest score excellent within the acceptable range.

Table 4 Modified Kappa Statistic

Attitudinal Component and factor	Total agreement	I-CVI	P_c	k	Evaluation
Affective					
Emotion and mood	10	1	0.001	1	Excellent
Preference	10	1	0.001	1	Excellent
Motivation	9	0.9	0.010	0.899	Excellent
Behavioural					
Habit	10	1	0.001	1	Excellent
Involvement	8	0.8	0.044	0.791	Excellent
Interaction	8	0.8	0.044	0.791	Excellent
Culture	8	0.8	0.044	0.791	Excellent
Control	9	0.9	0.010	0.899	Excellent
Cognitive					
Belief	9	0.9	0.010	0.899	Excellent
Perception	9	0.9	0.010	0.899	Excellent
Learning	9	0.9	0.010	0.899	Excellent
Persuasion	8	0.8	0.044	0.791	Excellent
Attention	6	0.6	0.205	0.497	Weak
Memory	6	0.6	0.205	0.497	Weak
Information	9	0.9	0.010	0.899	Excellent
Personality	9	0.9	0.010	0.899	Excellent
Social norm	9	0.9	0.010	0.899	Excellent

Table 3 and Table 4 showed a comprehensive result regarding the relevance of the items to the attitudinal component in the I-CVI score and the modified kappa statistic score. Items with I-CVI more than 0.78 and modified Kappa value above 0.6 are retained. However, the items with low I-CVI and modified statistic kappa scores below 0.78 and 0.6 respectively were subject to deletion. Surprisingly, two attitude factors, 'Attention' and 'Memory' (categorized under cognitive component) did not appear to be the important factors to be considered in green buildings, which only accounts for 50 % of total consensus explained.

Attention is important in shaping human perception and action in built environment (Bayer et al., 2017). The basic principle of attention is a set of organize process through which a person select specific environmental stimuli or inputs for cognitive processing (Graetz, 2006). Commonly, only one input is processed consciously which called as the attended input while the unattended inputs such as the environmental stimuli (background noise, room temperature), are processed unconsciously. An unconscious monitoring can detect changes in inputs when a person is not attending consciously, however that input might be important. Then, a process called attention controller may push the information into conscious awareness and resulted a new attended input. Then, a shift in attention perceived either in controlled, selective or unexpected, causing a distraction happen.

The enchanting description of green building captures the ideas to improve the environment and create a better place for human to stay and live should not only designing the building to save energy, the consideration of how the building environment can influence the attention of users is important. Whether working or staying in green building, the users are engulfed by the environmental information (Graetz, 2006). The features in the environment draw the user's attention such as a spacious space for activity, the color of the wall, the lighting of the room or even the smell of the ambient where all these environmental information could awash the users, affect users' emotion, cognitive process and behavioral consequences. However, the attention factor do not attain a high score in the content validity assessment. This most probably due to the manipulation of visual attention is not as simple as aesthetic activity where the designers can manipulate the visual form to create designs that let the people feel harmonic, happy and satisfy. Further, Bylinskii et al., (2015) stated the progress evaluation for

attention is particularly difficult. In an attempt to understand attention, various taxonomies and other categorization such as multiple types of computational models and specific subareas of visual attention are needed.

Furthermore, buildings can tap into the user's past and experience through their senses, emotion, create a new experience for the users and memory plays a major role in helping to make this possible. Memory is a personal experience of a person on events and objects in lives. Several studies have investigated different architectural styles (Choo et al., 2017), embodiment (Vecchiato et al., 2015), contours (Vartanian et al., 2013), height and enclosure (Vartanian et al., 2015), built vs. natural environment (Roe et al., 2013; Banaei et al., 2015), lighting (Shin et al., 2014), color (Küller et al., 2009), or the impact of the built environment on human memory (Sternberg, 2010, p. 147) because the memory of an individual engage human with buildings, influencing their perception and decision making. However, memory may be less reliable and more suggestible. According to the panel of experts, it is difficult to quantify memory due to every individual has different experience with different people or situation in the past. This is in line with what has been mentioned by Guggenheim (2009) that memory is between one people to one or several objects. Memories are subjective and are only relevant and enrolled by the person. It is often faint, distanced and difficult to explain by outsiders. Giving an example, an outsider could never understand why eating ice cream can gives a person happiness if the outsider does not eat ice cream before. The actual situation of eating ice cream does not convey any link to the past situation that involved ice cream. Likewise, it is not possible to test or to question memories. The memory correlated to the ice cream is not required to hold for anybody else except the person who undergoes it. Thus, it is understood that 'Memory' factor did not reach a high consensus due to it is vague to be identified.

5. Conclusion

This study demonstrated the content validity assessment to explain the relevancy of the items through a quantitative review from the expert panels. The initial phase of the process was scale development through literature review to construct the items represented in this scale. The development of this scale is to identify the user attitudinal component and factors to be considered in green building. The items in this scale were adapt and adopt from the previous research and the content validity assessment is necessary to make sure the user attitudinal components and factors are suit to the local context. The panel of expert involved in this assessment has experience in the field of environmental psychology from oversea and local. The content validity evaluation process by the expert panel in related fields have evaluated the content and structure of the instrument by examining each of the component and factors. The process yields a good recommendation from the experts. The final construct was modified based on the quantitative results of content validity.

Given the way in which the findings of this paper can make a significant contribution to the industry, it can also be stated that the results of this paper can contribute to informed decision-making on what human aspects to be taken into account by designers and building management (by knowing what component of attitude and factors to improve the performance of green buildings). The results of this paper enable designers, building managers and building scholars to know "what aspect to consider when considering the attitude of the user. In the Malaysian context, where the element of user attitude in the design and management of green buildings is almost unheard of, the results of this paper could be of great benefit to the building industry in order to carry out the future development of green buildings. In regards to green building research on the user, most of the study does not explicitly address the validity of the instrument used to measure the user attitude in green building. Thus, this study included the validation evidence of user attitude component and factor from the previous study and suited to the local culture and practice. Quantifying the user attitude component and factors in the green building provide the opportunity to the building industry to know what is related and what to consider about the user attitude. It will also indirectly act as an educational and instructional tool for building industry to involve the user attitude when developing green buildings.

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