Theoretical and Empirical Researches in Urban Management
Volume 13 Issue 2 / May 2018

MEASURING SUCCESSFULNESS OF MALAYSIAN GREEN OPEN SPACES: AN ASSESSMENT TOOL

Nurhayati Abdul MALEK
Centre of Studies in Landscape Architecture, Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia
nurhayati8203@salam.uitm.edu.my

Amanina NASHAR
International Islamic University Malaysia, Jalan Gombak 53100, Kuala Lumpur, Malaysia
ninanashar@gmail.com

Abstract
Numerous researchers had evidence on the significant roles of parks and green open spaces in addressing the cultural, social, environmental needs of its users, as well as its contribution to the living quality. Indeed, it is noticeable that parks functions had a strong connection with the theory of human needs particularly in offering the aesthetics pleasures, recreational opportunities, being close and contact with nature. Nevertheless, a successful parks criterion is not merely intended to provide sufficient amount of green spaces per se, but rather to focus on the park quality to serve its people. The Structural Equation Modelling (SEM) method is one the effective means applied in this paper, to develop the assessment tools for Malaysian neighbourhood parks. The SEM findings indicates it is a good fitting model with (χ^2/df =2.158; RMSEA = .071, CFI = .893; AGFI= .873; GFI = .899, p = .000) and variance extracted (VE) was 37%. Hence, it is hoped that the quality neighbourhood park (QNP) assessment tools produced based on the model result will assist planners and landscape architects to produce high quality of Malaysia Neighbourhood Parks in future.
Keywords:Use, Preferences, Needs, Quality Neighbourhood Park, Structure Equation Model (SEM)

1. INTRODUCTION

A recent study conducted had far linked the importance of having a good quality neighbourhood park in planning and design. This implication is due to the fact that numerous growing of research had emphasis on the contribution and benefits that offer by green open spaces (GOS) or parks, such as urban parks, greenbelt and neighbourhood parks to increase in people quality of life particularly in urban area (Banerjee, 2003, Chiesura, 2004; Lee, 2015). However, several current studies had evidence that majority of Asian cities including Malaysia are experiencing underutilized parks within neighbourhood area (Moser, 2010; Karuppannan and Sivam, 2012). In Malaysia, this issue is identified based on

several factors of , i) deficiency of open spaces , ii) park physical attributes , iii) public participation integration and iv) park quality (Ujang and Dola, 2007; Karuppannan and Sivam, 2012 ; Azmi and Karim, 2012 ; Miao, 2013; Harun, Zakariya, Mansor and Zakaria, 2014). According to Gehl and Gemzoe (2000), park quality is an essential criterion which believed to influence the activities performs within the space. While low qualities GOS stimulates 'necessary' types of activities, a high-quality GOS supports varieties of activities including the optional and social activities (Gehl, 2006).

A growing number of parks-related studies only stresses on the importance of having a good quality park. Yet, none of the studies related to quality neighbourhood parks or green open spaces, have addresses on details description or criteria of a good quality neighbourhood park (Nurhayati, Mariapan and Mohd Shariff, 2012). In order to establish the Quality Neighbourhood Park (QNP) assessment criteria for this study, three important theories involved are; i) Maslow Theory of Human Needs (1954), ii) Theory of Reasoned Action (TRA), by Ajzenand Fishbein (1975), and iii) Theory of Urban Parks and City Sustainability (Cheisura, 2004). For this study, the QNP assessment tools were based on Malaysian park user's need and preferences. This reason is that there is a very limited study that hasbeen conducted related to use and perception of green open spaces particularly in developing countries (Willemse, 2010). Moreover, this study believed that a high quality of green open spaceis part of essential indicator to a sustainable city, which conforms to liveable city aspiration, human social and psychological needs. Hence, this studydiscusses the needs and perception towards park usefulness in Malaysia neighbourhood parks, to produce the assessment tools for future park planner's references.

2. FACTORS TO SUCCESSFUL GREEN OPEN SPACE (GOS)

A comprehensive review on successful GOS design criterion was conducted for the purpose of this paper in order to obtain the knowledge of quality neighbourhood park (QNP). Four sub-factors identified based on the reviews, are named as; i) natural surroundings factor (NSF), ii) cultural and social factors (CSF), iii) space and design aspect (SD) and, iv) external factors (EF). The summary of these four factors is presented as Table 1:

TABLE 1 - SUMMARY REVIEWS RELATED TO QNP

Year & Source/country	Site categorization	Main Findings
Smith et.al, (1997)/ Canada	Urban Community	**NSF :** Landscape Elements , **CSF:** Walkable community, Preservation of natural and cultural features **SD:** Outdoor amenities; Accessibility & Connection; Character & Distinctiveness, active sports facilities **EF:** Barrier-free

Year & Source/country	Site categorization	Main Findings
Sanesi and Chiarello (2006)/ Italy	Urban green space	**NSF:** Increase the amount of green space **CSF:** Utilization;socializing space; activities for all ages ; air quality **SD:** quantity & quality of green spaces ; facilities; play equipment; sports facilities; walking path ; cycling tracks **EF:** management; safety; funding
Zhang et.al (2015)/ German	Urban green space	**NSF:** aesthetics quality, encourage natural contact, landscape elements **CSF:** socializing space **SD:** varieties of activities(utilization), user's needs, perception and senses, easy access , comfortable space with good image, facilities **EF:** well maintain park& facilities, facilities arrangement
Villanueva et.al (2015)/ Australia	Public Open Space	**NSF**: aesthetics quality, landscape elements, environmental qualities (air, temperature, noise, pollution) **CSF**: spatial utilization, recreational activities (culturally based activities), social interaction **EF** : accessibility, attractiveness, amenities& facilities, proximity/distance
Davern et.al (2016)/ Australia	Green Open Space	**NSF**: landscape elements, habitat & vegetation complexity support ecosystem & biodiversity, varieties of green space **CSF**: Social infrastructure, needs & preferences **EF** : accessibility & distance , size & area , sense of community, safety, comfort ,space arrangement & connectivity, Heterogeneity, environmental quality (air, noise)

3. HUMAN NEEDS OF GREEN OPEN SPACES IN NEIGHBOURHOOD PARK

In Malaysia park planning process, public participation intergration is one of the essential factors to neighbourhood park underutilization, due to top-down initiatives practices by the local government (Miao, 2013; Moulay, Ujang and Said, 2017) . This implicates that it is important for human needs to be included in park planning process to established a successful green open spaces design. Six categories of needs according to the Maslow theory starts with physiological needs (the most essential and basic human needs), followed by sense of belonging (belong to a community), safety, appreciation, self-actualization, and cognitive-aesthetic (learn and appreciate beauty) as indicated by Maulan (2015). Meanwhile, the theory of Reason Action (known as a grounded theory to behavioural prediction), believed that people decision is based on the consequences of their action, before performing a specific behaviour. The theory believed that people intention are based on two basic determinants; i) the personal, and ii) social influences. The first determinant factor deals with one's positive and negative assessment of performing the behaviour, known as attitude towards behaviour which related to the intention of this study. Since each person had their own unique needs and satisfaction level, each needs construct need to be examinedto achieve a successful neighbourhood park (Carr, Rivlin and

Stone,1992, Iamtrakulet, Teknomo, Ge and Hokao, 2005; Maulan, 2015; Moulay,et al., 2017). Table 2 is generated based on the three theory above and literature reviews regarding the Needs concept.

TABLE 2 - NEEDS MEASURES AND ITS CHARACTERISTICS FOR THIS REVIEW (Source: Nurhayati, 2012)

Needs Measures	Characteristics
Contact with Nature	Psychological, Physical Health, Satisfaction level, Connect with the natural environment, Emotion
Recreational Opportunities	Passive, Active and Social based activities
Social Interaction	Among neighbourhood residents, youths, Diverse cultural & demographics, privacy needs, psychological well-being, convenience
Aesthetic Preferences	Attractiveness, cleanliness level, pleasurable sounds, aesthetic appeal and settings

3.1. Hypothesized model of Quality Neighbourhood Parks

Based on critical reviews of parks-related studies and theories, a hypothesised model in Figure 1 is developed and applied to ascertain the factor and measure the influences of independent variables (PR, UP, ND) on the dependent variables (SQGOS, HIN, NN, POU, and U).

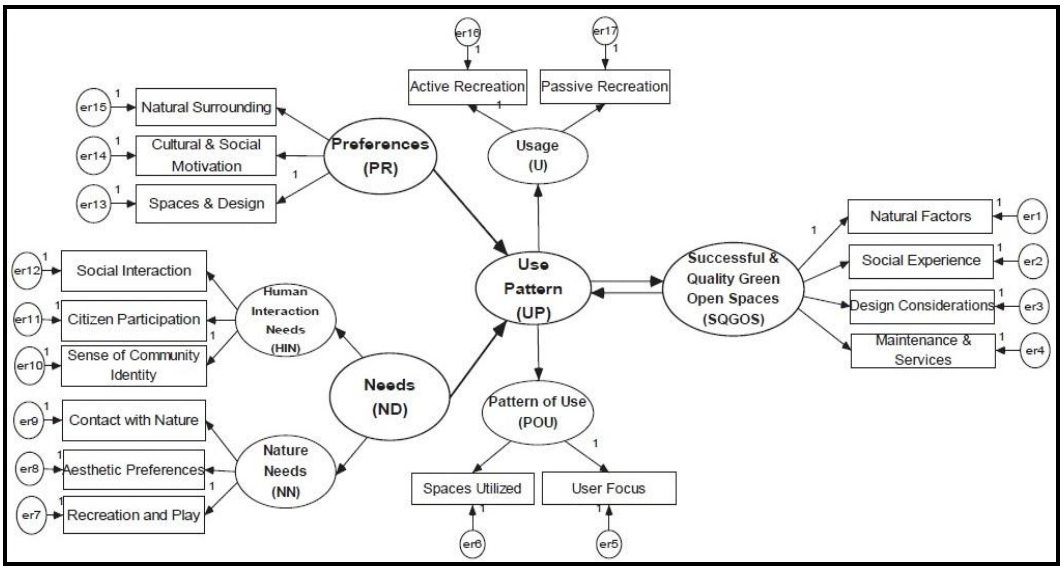

FIGURE 1 - A HYPOTHESISED MODEL APPLIED TO IDENTIFY THE QNP.

Six hypotheses formulated based on Figure 1 are; i) high-quality neighbourhood park is based on the higher number of use among park users'(Adapted from Alldredge, 1973; Witten et al., 2003), ii) the quality of a neighbourhood park will increase when the needs of park users' is catered for (Adapted from Maslow human needs theory, 1954; Fornell and Manfredo, 1996), iii) the quality of a neighbourhood park increase when the park users' preferences aspect is fulfilled (Adapted from Maslow human needstheory, 1954 study), iv) better overall satisfaction or quality of experience increase when there is higher level of park use, v) the determination of quality in a neighbourhood park differ accordingly to

Theoretical and Empirical Researches in Urban Management
Volume 13 Issue 2 / May 2018

socio-demographic pattern of park users, and vi) the QNP criteria can be achieved when use pattern; needs; preferences; and overall satisfaction aspect are fulfilled.

4. THE METHOD OF STRUCTURAL EQUATION MODELLING (SEM)

This review applied the quantitative method to identify the 'cause and effects' through positivist knowledge claims. It explained the cause and effects between, needs, preferences and usedpattern to achieve Quality Neighbourhood Park (QNP). A total number of 416 returned a questionnaire from two selected parks (Taman Rimba Riang (n=266), and Taman Lembah Kiara, (n=148) were then analysed using Analysis of Moment Structure (AMOS16) and the statistical software package for the social science (SPSS). Model demonstrate in Figure 1 validate the hypothesis originated from the grounded aforementioned theories, combined with a particular set of belief on outdoor recreation, which influencing the use pattern (Attitude measurement-TRA, 1975); needs and preferences towards QNP. The outcomes will effects park users behavioural intention on park spaces utilisation (Subjective-norm-TRA, 1975); needs motivation, use pattern and preferences which demanded towards QNP (the behavioural intention-TRA,1975 and Human Needs Theory, Maslow, 1954). SEM statistically tests a hypothesised model to determine the reliability of that model with the sample data. Hence, answer the mentioned hypothesis earlier, where indicates that QNP is obtained when the parks conform to the use pattern criteria, user's needs and preferences.

5. RESULTS AND DISCUSSIONS

The QNP is measured based on three factors of preferences (PR), needs (ND) and usage (U). The resident level of satisfaction and preferences on three criteria of PR, ND and U were identified based on SQGOS, HIN, NN, POU, and U, through five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agreestrongly Agree). The reliability of questionnaire instruments was tested using through composite reliability and variance extracted, to investigate to which point the multiple indicators for the latent variable fit together. Chi-Square (χ^2) statistics, maximum likelihood estimation, and several goodness-of-fit criteria were computed through CFA to confirm the overall fit of the measurement model. The model is evaluated to identify the 'goodness of fit' for the sample data using statistical methods.

5.1 The Relationship of Quality Neighbourhood Park with Park Utilization, User's Needs and Preferences

Figure 2 present the final structural model of five-factor models for QNP (quality green open spaces (Factor 1), needs (Factor2), use (Factor 3), satisfaction (Factor 4) and preferences (Factor 5). The

goodness of fit had clear evidence that the hypothesised model is consistent with the data (Figure 2). The model is adequately fit, with GFI=0.899,CFI=0.893, and AGFI=0.873,which are close to 0.90. According to Schermelleh-Engel and Moosbrugger (2003), all of the values between 0.90 to 0.97 are considered as adequately fit. The RMSEA value of 0.055, the x^2 value of 577.022 (258 df) is statistically significant with a value of 2.23 at the .000 probability level. The probability level was at .000 level is due to the large sample size acquired for this study (n=414). In this case, Schermelleh-Engel and Moosbrugger (2003) added that the RMSEA values should be between 2 to 3 while the CMIN/df value should be in between .05 to .08 which indicates that this model is acceptable fit.

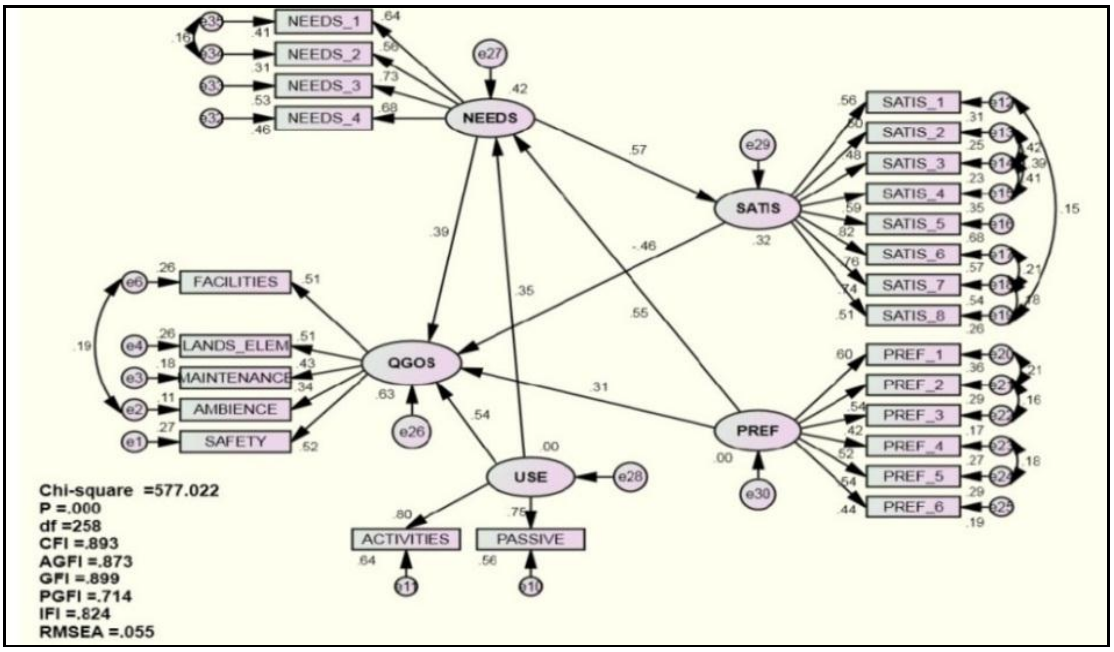

FIGURE 2 - THE FINAL STRUCTURAL MODEL

The structural model presented had supported the theoretical measures mentioned earlier (Figure 2). This is evidence through a positive relationship formed between Quality Green Open Space (QGOS) and all three factors tested which includes; i) needs (ND), ii) use pattern (USE), iii)preferences (PREF) as well as NEEDS and Overall satisfaction (SATIS). Whereas, the model formulated did not support the association between USE and SATIS. The path analysis results had also supported hypothesis 1, 2 and 3, which all three factors (ND, USE and PREF) demonstrate a positive and direct relationship on QGOS, suggesting 37% of the variance explained by the dependent variable, QGOS. All three factors results had agreed with SEM results of high loading values. This account is proven through final structural model on USE (F3) measures which indicated high loading (0.54), between both measures on regression weight to QGOS (F1). The loadings from both variables towards all related items were also high with an average of .50. The second objective derived from Maslow (1954) theory on human needs

Theoretical and Empirical Researches in Urban Management
Volume 13 Issue 2 / May 2018

and Fornell and Manfredo (1996) TRA; indicate there is a significant relationship between the ND and QGOS variables. Simple mean test effect was conducted to identify the effects of park sites with Needs factor (Table 3). The results revealed that there exists a significant mean difference between park sites and physical needs and surroundings needs (p=0.001). Whereas, no significant differences identified for privacy needs, participation needs and interaction needs.

TABLE 3 - SIMPLE MEAN EFFECTS TEST ON PARK SIDE AND NEEDS FACTOR

NEEDS MEASURES	*df*	Sum of squares	Mean square	F value	*p*-value
Participant Needs	1	2.494	2.494	6.228	0.013
Surroundings Needs	1	20.615	20.615	28.323	0.000
Physical needs	1	10.663	10.663	20.772	0.000
Interaction Needs	1	0.068	0.068	0.153	0.696
Privacy Needs	1	0.937	0.937	2.134	0.145

The results obtained had agreed with the SEM data and supported the descriptive data. Based on figure 3, the QGOS (F1) factors demonstrate high loading value on regression weight to ND (F2) factor (0.31) between both factors. Meanwhile, the standardised estimate reading also indicates high loadings with average value .53 for both factors towards all related items. The third hypothesis is to test the relationship of quality of neighbourhood park and user's preferences as mentioned by Maslow (1954) theory. These results also supported the SEM results, where the QGOS (F1), indicates high loading on the regression weights towards PREF (F5) factor with loading value of 1.23. Both factors load high value towards all related items with an average value of .63. Similarly, the path analysis model (Figure 3), demonstrate a positive and direct relationship of PREF and QGOS, suggesting 37% of the variance explained by the dependent variable, QGOS. Indeed, hypothesis 3 was also supported.

5.2 Relationship between level of Park Usability and Overall Satisfaction

Hypothesis 4 is to test whether the overall satisfaction of the park increase if there exist high park utilisation (Parasuraman et al., 1994). Interestingly, the results had found a new but negative correlation between SATIS and QGOS which was not projected in the path model nor the initial structural model. This result is represented by the insignificant of the SATIS and QGOS relationship within the path model result. Hence, this implicates that the overall QNP does not relate to overall park user's satisfaction. Moreover, there exists no relationship between USE and SATIS (Figure 3). This indicates that the data does not support the initial theory tested in this study. Meanwhile, path analysis results (Figure 3), indicates no direct relationship between (OVRL_SATISFAC) to the quality of neighbourhood parks (QGOS), suggesting no relationship between these two factors. Whereas, shows

a positive relationship between USE and OVRL_SATISFAC with a total of 42% variance explained. It is, therefore, implicates that the results do not support those above objective four earlier.

Meanwhile, only one direction of the relationshipwas omitted from the final structural model which is from PREF to SATIS, where it was found to support the theoretical model. The final structural model results had omitted only the covariance from AMBIENCE to SAFETY as suggested by modification indices for better fit model index. However, there exists a significant relationship between all available constructs and items based on the final structural model computed. The significant relationships with the selected variables are identified in their regression weight through the full fledge structural model (Figure 2).

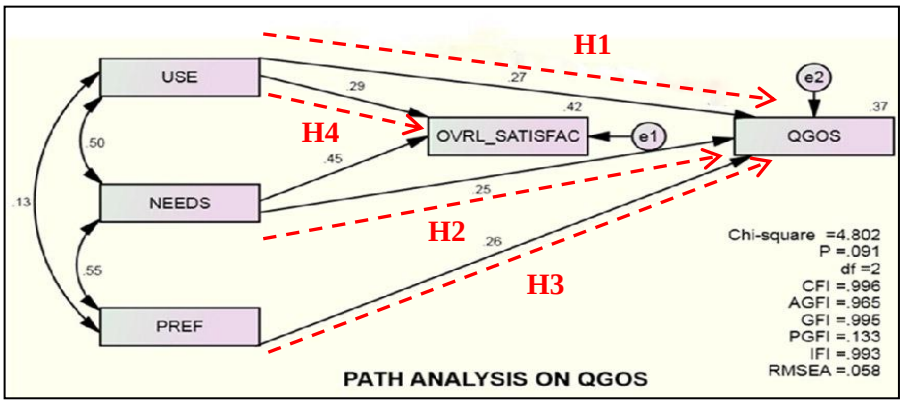

FIGURE 3 - RESULT AS SHOWN IN PATH ANALYSIS MODEL

5.3 The Relationship of Quality Neighbourhood Park to Socio-Demographic factor

Path analysis model for Hypothesis 5 (Figure 4) indicates that there was no significant correlation between QGOS and socio-demographic background (sex, marital status, monthly wages, age, ethnic group, education level and occupation). This implies that different socio-demographic background specifies different acceptance on QGOS. Hence, the findings supported hypothesis 5 of this study.

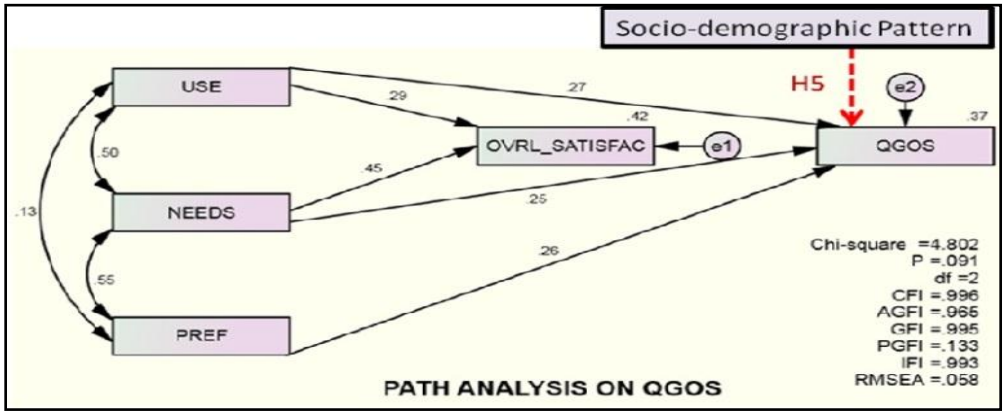

FIGURE 4 - RESULT AS SHOWN IN PATH ANALYSIS MODEL

Theoretical and Empirical Researches in Urban Management
Volume 13 Issue 2 / May 2018

5.4 The Relationship Between Use Pattern , Needs, Preferences And Overall Satisfaction

Result generated on the final hypotesis 6 implicates that ; i) there is a significant relationship with the estimated standardized path coefficients for the direct effects of USE on QGOS which value is .299 and .050 respectively with 37% variance explained, ii) there exist a significant relationship with the estimated standardized path coefficients for the direct effects of NEEDS on QGOS which .303 and .065 respectively with 37% variance explained, iii) there exist a significant relationship with the estimated standardized path coefficients for the direct effects of PREF on QGOS with .468 and .085 respectively with also 37% variance explained, and iv) there is no direct effect of overall park user's satisfaction on the quality of green space. Use pattern and needs are two factors which indirectly affect QGOS on the overall satisfaction among park users. Therefore, the results discussed above implicates that only two factors of needs (ND) and use (USE) were proven to contributes to overall user's satisfaction with parks. Interestingly, no direct effect found on these two factors on quality green open spaces (QGOS). All of the results discussed above had formulated the assessment tool of QNP for park future planning and design in Malaysia.

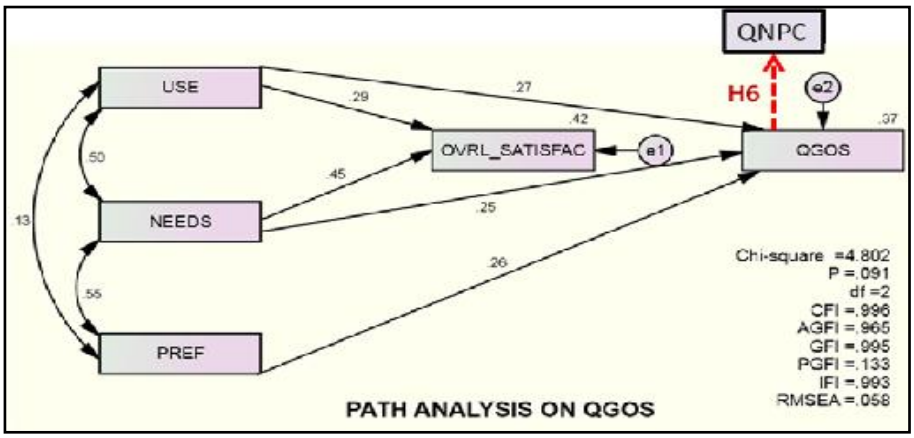

FIGURE 5 - RESULT AS SHOWN IN PATH ANALYSIS MODEL

5.5.Developing Malaysia's QNP assessment tool

5.5.1. Use pattern

Urban theories argue that GOS should function as spaces that enhance social contact, public interaction and social communication (Madanipour, 1996; Katz, 1994; Carmona, Heath, Oc and Tiesdell, 2003; Freestone and Nicholas, 2004). Previous, evidence from the findings suggests that use pattern is among the essential criteria to QNP. In this study, use pattern is translated as space utilization throughout the activities performs. Three use pattern sub-themes generated are; i) passive activities, ii) active activities and iii) activities (common and daily activities perform at the park). Moreover, the results

demonstrate that Malaysian park users do not only utilise the park to play games like skating, badminton, etc. They also enjoy socialising and other activities, for instance, jogging and meeting friends. Hence, this implies that it is essential for the neighbourhood parks to offer various types of activities for the purpose of social sustainability and enhancement.

A successful QNP offers a variety of activities to all age group and demographic background, which demand different types of activities. Study conducted in three Asian cities on GOS utilization in neighbourhood area, evidence that varieties of activities offers at the park is one of the significant aspect to influence park use . The study further revealed that park users in Kuala Lumpur and Delhi cities were not happy with activities offers at the park due to insufficient facilities and maintenance issues (Karuppannan and Sivam, 2012). Besides activities, urban theories agreed that includes maintenance, accessibility, size, proximity and landscape elements are among other essential factors to influence park use (Corbett and Corbett, 2000; Ewing and Handy, 2009; PPS, 2011, Lee et al., 2015; Zhang et al., 2015). Indeed, studies conducted by Sanesi & Chiarello (2006), Zhang, Dijk, Tang and Berg (2015), found that a well-maintained park, facilities arrangement, and park quality were among significant measures to successful urban green space.

5.5.2. Needs for Neighbourhood Park

Previous, the findings had confirmed that there exists a positive relationship between QGOS and needs aspects. This implicates that, identifying and paying attention on park user's needs is important to produce successful QNP in Malaysia. In compliance with Maslow theory of Human Needs, affection belonging (needs to belong to community) and cognitive-aesthetics indeed among the important findings found for this review. Previous, the findings revealed that majority of park users agree to engage in nature conservation programme and other event held in the neighbourhood park, as well as in needs for more facilities for physical activity, and BBQ facilities. Moreover, the findings presented earlier also agreed with the theory of Chiesura (2004) on the role social services provided by parks towards city sustainability. Hence, the basis of urban park assessment should begin with the needs and beliefs consideration towards sustainable city plans. It is however, important to note that a growing number of studies had indicated that park user's needs particularly activities, facilities; accessibility mightvary accordingly to demographic background (Sanesi & Chiarello, 2006; Nurhayati, Manohar and Nik Ismail, 2015; Amine, Norsidah and Ismail, 2017). Additionally, among first good impression of a park to the user's eyes includes parks that meet the user's needs, landscape elements, attractiveness, well-maintained park, facilities, and management (PPS, 2001).

Theoretical and Empirical Researches in Urban Management
Volume 13 Issue 2 / May 2018

5.5.3. Preferences towards neighbourhood park in Malaysia

The consideration on user's needs, preferences and interest would improve the use and image of GOS (Hayward and Weitzer, 1984). Earlier, the results obtained suggested that landscape and natural elements were essential factor to successful neighbourhood parks in Malaysia. Results on parks preferences indicate that Malaysian park user' favour variations of large shade trees, parks spaces with aesthetic values, complex space and unique features. These finding is supported by the theory of Malsow (1954) of human needs on nature. To date, numerous studies had also highlighted on natural surrounding benefits and its positive relationship to human physical, psychological well-being, recreational opportunities and its environmental values (Chiesura, 2004; Mitchell, 2008; VanDillen, De Vries, Groenewegen & Spreeuwenberg, 2012; Wolch, Byrne and Newell, 2014 ; Zhang, van Dijk, Tang and Berg, 2015). Hence, it is suggested that landscape elements such as water and shady trees as part of essential features to QNP assessment criterion in Malaysia. Similarly, the QNP assessment tools in Malaysia developed for this study were closely related to the current urban green space assessment criteria produced by Nordic Green Space Award (Lindholst et al., 2016) in Denmark.

6. CONCLUSIONS

Designing a successful or quality neighbourhood park across different background and culture is somewhat a challenging for a country like Malaysia. Planning for neighbourhood parks requires details concern on design principles of balance, aesthetics and placement of landscape elements that easily detectible to user's eyes. Based on the result and theory discussed above, the assessment criteria for Malaysia QNP are formed as presented in Table 4. The assessment tools are evaluated in the form of scoring system categorised as low (0-39), medium (40-69) and high quality (70-100) with total of 14 sub-criteria. Interestingly, several criteria found for this study were also closely related to other three park assessment schemes, named as Green Flag Award (GFA) in England, Entente Florale in England and France, and Nordic Green Space Award (NGSA) in Denmark. Finally, it is hope that the assessment criteria could be an easy reference tools for Malaysian planners and designer to assess, and develop a quality neighbourhood park particularly on overall satisfaction, preferences, use pattern and user's needs in future.

TABLE 4 - DESIGN RECOMMENDATION TOOLS FOR MALAYSIAN QNP

DESIGN RECOMMENDATION TOOLS FOR NEIGHBOURHOOD PARKS					
Method of Assessment and Criteria		Level of importance			SCORE
Areas of Development	Criteria list	Excellent	Acceptable	Poor	
	SCORE	5	3	2	
Distance	The distance of NP is very important and should be within a housing area	1km ≤ distance ≤ 2km	2km ≤ distance ≤ 3km	More than 5km	
Location	Location of NP is important to allow accessibility as well as comfort	Further away from main roads to hinder heavy street noise	Choice of NP location is still vital to avoid heavy street noise	Directly next to main roads	
Facilities	Facilities for organisedsports or games	Mountain, biking, boating	Tennis/Badminton courts; Skating areas	None is provided	
	The management of the park should provide organised sports or games	Weekend biking activities, weekend events	Weekend tournaments; monthly/yearly events	None is provided	
Accessibility	Easy accessibility to the NP	Various entrance route to NP(≥ 4)	At least two main entrance route to NP	Only one access and exit route	
LandscapeElements	Provide play equipment andfacilities for children	Play equipment and facilities according to age groups by specifying areas in NP	Play equipment and facilities for two main groups (i.e. 1-3 and 3-12 years of age)	Only one small and standard play area for all	
	Provide park segmentation (NP design is divided intoseveral zones for specific activities)	Spaces within NP is clearly but creatively divided into several zones (according to active and passive activities)	Only important activities such as play area for children and probably exercise station is provided	No specific areas for any activities – no privacy	
	Ponds (naturally or artificial)	Good NP should have naturallydesign or constructed ponds/water feature	Should at least have artificial ponds/water feature	No ponds or any water feature available	
	Trees	With more mature and bigger trees	Lots of mature and bigger trees are always essential	Not enough big trees	
Basic Facilities	Needs for adequate basicpark facilities should beprovided	Basic facilities (benches, rubbish bins, lighting and signage) should be provided; BBQ facilities and F&B Kiosk could be a new requirement for Malaysian NP needs	At least basic facilities such as benches rubbish bins, lighting and signage should be provided;	Even the basic park facilities are still lacking	
Maintenance	Overall NP maintenance	Daily maintenance (keeping the grass well-kept; controls the water feature odour; dead plants are regularly removed etc.)	Maintenance towards all necessary elements in the park should be done in a regular basis.	Maintenance could not be done regularly due to manpower or financial resources	
Ambience	Green ambience	To provide as much large outdoor spaces with spaces close toeach other	Users prefer large outdoor spaces with spaces close to each other	Spaces in NP is small and cramp or even far away from each zones	
NaturalSurroundings	Needs for natural surrounding	Natural surrounding needs include adequate pockets of open spaces within NP with landscape elements like ponds, trees & turf area	natural surrounding needs include adequate pockets of open spaces within NP with landscape elements like ponds, trees and turf area	There are not enough pockets of open spaces within NP	

DESIGN RECOMMENDATION TOOLS FOR NEIGHBOURHOOD PARKS					
Method of Assessment and Criteria		Level of importance			SCORE
Areas of Development	Criteria list	Excellent	Acceptable	Poor	
	SCORE	5	3	2	
Safety	Creating features in NP for safety purposes	Good position and ample garden lighting is important especially for night use	Good position and ample garden lighting is important especially for night use;	No lighting is provided and night usage is prohibited;	
	Safe from vandalism and graffiti	The surrounding ambience of NP should be well-kept and progressively monitored to avoid vandalism and graffiti	The surrounding ambience of NP should be well-kept and progressively monitored to avoid vandalism and graffiti	The surrounding of NP is not monitored allowing vandalism and graffiti	
Nature Preferences	Based on users most preferred aspects towards nature	Most users prefer better connectivity of tree clusters and variation of large shaded trees	Trees should be connected in clusters and have variation of large shaded trees	Trees are planted far from each other; no connectivity and shaded area	
Design Preferences	Based from users most preferred aspects towards NP design	Most users prefer functional park facilities; parks that have aesthetic values; unique	with some aesthetic values and unique features;	Park facilities are not functional; no aesthetic value; no unique	
Participation	Needs for community participation to enhance sense of belongings	The NP should allow for continuous nature or conservation participation in any activities or event held in the park	The NP should allow for continuous participation in any activities or event held in the park	The NP surrounding and design do not allow for any community nature or conservation participation	
Satisfaction criteria	Overall satisfaction criteria	Enough recreational activities for everyone, size of NP, the sound of water, many large shaded trees and continuous future usage of NP describes total satisfaction to users	To at least provide ample recreational activities for everyone, acceptable size of NP, the sound of water, and enough large shaded trees	The park users do not prefer smaller parks and when there are not enough recreational opportunities for everyone	
				TOTAL SCORE	**100**

SCORING SYSTEM CRITERIA:

High Quality = 70-100

Medium = 40-69

Low = 0-39

ACKNOWLEDGEMENTS

This research would like to thank Universiti Teknologi MARA as well as the private sector in the field of Landscape Architecture in Malaysia for supplying the resources and amenities to complete this paper.

REFERENCES

Alldredge, R. B. (1973). Some capacity theory for parks and recreation areas.*Trends, 10* (4), 20-30.

Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behaviour*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Aspinall, P., Mavros, P., Coyne, R., & Roe, J. (2015). The urban brain: analysing outdoor physical activity with mobile EEG. *Br J Sports Med*, *49* (4), 272-276. http://dx.doi.org/10.1136/bjsports-2012-091877

Alves, S., Aspinall, P. A., Thompson, C.W., Sugiyama, T., Brice, R., & Vickers, A. (2008). Preferences of older people for environmental attributes of local parks: the use of choice-based conjoint analysis. *Facilities, 26* (11/12), 433-453.

Azmi D. I. & Abdul Karim H. (2012). Implications of walkability towards promoting sustainable urban neighbourhood. *Procedia - Social and Behavioral Sciences*, *50*, 204–2013.

Banerjee, B. (2003). Who sustains whose development? Sustainable development and the reinvention of nature. *Organization Studies*, *24* (2), 143–180. http://dx.doi.org/10.1177/0170840603024001341

Carr, S., F., M., Rivlin, L.G., & Stone, A.M. (1992). *Public Spaces*. New York, Cambridge: University Press.

Carmona, M., Heath, T., Oc, T. & Tiesdell, S. (2003) *Public Places – Urban Spaces: The Dimensions of Urban Design*. Oxford, UK : Architecture Press.

Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, *68* (1), 129–138. http://dx.doi.org/10.1016/j.landurbplan.2003.08.003

Corbett, J. and Corbett, M. (2000). *Designing Sustainable Communities: Learning from Village Homes*, Toronto, Canada: Island Press.

Davern, M., Farrar, A., Kendal, D. & Giles-Corti, B. (2016). Quality Green Public Open Space Supporting Health, Wellbeing and Biodiversity: A Literature Review. Report prepared for the Heart Foundation, SA Health, Department of Environment, Water and Natural Resources, Office for Recreation and Sport, and Local Government Association (SA). University of Melbourne: Victoria.

Ewing, R., & Handy, S. (2009). Measuring the unmeasurable: Urban design qualities related to walkability. *Journal of Urban Design*, *14*(1), 65-84.https://doi.org/10.1080/13574800802451155

Francis, J., Wood, L., Knuiman, M., & Giles-Corti, B. (2012). Quality or quantity ? Exploring the relationship between Public Open Space attributes and mental health in Perth, Western Australia. *Social Science & Medicine*, *74*(10), 1570-1577. http://dx.doi.org/10.1016/j.socscimed.2012.01.032

Freestone, R., & Nichols, D. (2004). Realising new leisure opportunities for old urban parks: the internal reserve in Australia. *Landscape and Urban Planning*, *68* (1), 109-120.

Fornell, C., M. D. Johnson, E. W. Anderson, J. Cha, & B. E. Bryant. (1996). The American Customer Satisfaction Index: Nature, Purpose and Findings. *Journal of Marketing, 60* (4), 7-18.

Gehl, J. and Gemzøe, L. (2000).*New City Spaces*.Copenhagen, Denmark: Danish Architectural Press.

Gehl, J. (2006). *Life between buildings: Using public space*. Skive, Denmark: The Danish Architectural Press.

Harun N. Z., Zakariya K., Mansor M. & Zakaria K. (2014). Determining attributes of urban plaza for social sustainability. *Procedia- social and behavioral sciences*. 153, 606–615.

Hashim, A. E., Samikon, S. A., Ismail, F., & Ismail, Z. (2015). Managing Facilities on Malaysian Low-cost Public Residential for Sustainable Adaptation. *Procedia-Social and Behavioral Sciences*, *168*, 52-60.

Hayward, D.G. and Weitzer, W.H. (1984). The public's image of urban parks: Past amenity, present ambivalance, uncertain future. *Urban Ecology* , *8* (3): 243–268.

Iamtrakul, P., Teknomo, K., Ge, J., &Hokao, K. (2005). Interaction of activity involvement and recreational location selection behaviour in Lowland City: A case study of public parks in Saga City, Japan. *Journal-Zhejiang University Science*, *6*(8), 900.

Karuppannan S. & Sivam A. (2012). Comparative analysis of utilisation of open space at neighbourhood level in three Asian cities: Singapore, Delhi and Kuala Lumpur. *Urban Design International*, *18*(2), 145–164.

Katz, P. (1994) *The New Urbanism: Toward an Architecture of Community.* New York: McGraw Hill.

Lee, A. C. K., Jordan, H. C., & Horsley, J. (2015). Value of urban green spaces in promoting healthy living and wellbeing: prospects for planning. *Risk management and healthcare policy*, *8*, 131. doi: 10.2147/RMHP.S61654

Lindholst, A. C., van den Bosch, C. C. K., Kjøller, C. P., Sullivan, S., Kristoffersson, A., Fors, H., & Nilsson, K. (2016). Urban green space qualities reframed toward a public value management paradigm: The case of the Nordic Green Space Award. *Urban Forestry & Urban Greening*, *17*, 166-176.

Maas, J., van Dillen, S., Verheij, R., &Groenewegen, P. (2009). Social contacts as a possible mechanism behind the relation between green space and health. *Health & Place*, *15*(2), 586-595. http://dx.doi.org/10.1016/j.healthplace.2008.09.006

Madanipour, A. (1996). *Design of urban space: an inquiry into a socio-spatial process*. Newcastle upon Tyne , UK : John Wiley & Son Ltd.

Malek N. A (2010). *Assessment of satisfaction, preferences, needs and use patterns in quality neighbourhood park development in Malaysia*. (Unpublished doctoral dissertation).Universiti Putra Malaysia, Selangor, Malaysia.

Malek N. A, Mariapan M., Mohd Shariff M. K. & Aziz A. (2011). Assessing the needs of a quality neighbourhood park. *Australian Journal of Basic and Applied Sciences, 5* (10):743-753.

Malek N. A, Mariapan M., & Mohd Shariff M. K (2012). The Making of a Quality Neighbourhood Park: A Path Model Approach. Procedia - *Social and Behavioral Sciences*, 49:202 – 214

Malek N. A, Mariapan M., & Azlan N. I. (2012). Community Participation in Quality Assessment for Green Open Spaces in Malaysia. *Procedia - Social and Behavioral Sciences*, 168,219 – 228.https://doi.org/10.1016/j.sbspro.2014.10.227

Manfredo, M. J., B. L. Driver, & M. A. Tarrant. (1996). Measuring Leisure Motivation: AMeta-Analysis of the Recreation Experience Preference Scales. *Journal of leisure research 28*, 188 - 213.

Maslow A. (1954). *Motivation and Personality*. New York: Harper and Row.

Maulan, S. (2015).Preferences for usability at Taman Tasik Seremban, Malaysia, *ALAM CIPTA: International Journal of Sustainable Tropical Design Research and Practic*e, 8: 28-33.

Miao, P. (2013). Beyond the image: Reusing tradition in modern design. *Journal of the Indian Institute of Architects*, *78*(12), 13–18.

Mitchell, R., &Popham, F. (2008). Effect of exposure to natural environment on health inequalities: an observational population study. *The Lancet*, *372*(9650), 1655-1660.https://doi.org/10.1016/S0140-6736(08)61689-X

Moulay A., Ujang N. & Said I. (2017). Legibility of neighbourhood parks as a predictor for enhanced social interaction towards social sustainability. *Cities*, 61: 58-64.

Moser, S. (2010). Putrajaya: Malaysia's new federal administrative capital. *Cities*, *27*(4),285-297.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1994). *Moving forward in service quality research: Measuring different customer-expectation levels, comparing alternative scales, and examining the performance-behavioural intentions link*. Cambridge, Massachusetts: Marketing Science Institute.

Project forPublic Spaces (2001). *How to turn a place around: a handbook of creating successful public spaces*, New York: Project for Public Spaces.

Reeves, C. A., & Bednar, D. A. (1994).Defining quality: alternatives and implications. *Academy of Management Review*, *19*(3), 419-445.

Sanesi, G., & Chiarello, F. (2006). Residents and urban green spaces: The case of Bari. *Urban Forestry and Urban Greening, 4*, 125-134.

Smith, T., Nelischer, M., Perkins, N. (1997). Quality of an urban community: a framework for understanding the relationship between quality and physical form. *Landscape Urban Plan, 39* (2–3), 229–241.

Sugiyama, T., & Ward Thompson, C. (2008). Associations between characteristics of neighbourhood open space and older people's walking. *Urban Forestry & Urban Greening*, *7*(1), 41-51. http://dx.doi.org/10.1016/j.ufug.2007.12.002

Ujang N. & Dola K. (2007). Linking Activity and Place Attachment Dimensions in Enhancing the Sense of Place. *International Journal on Sustainable Tropical Design Research and Practice*, *2*(1), 59-67.

Van Dillen, S. M., de Vries, S., Groenewegen, P. P., &Spreeuwenberg, P. (2012).Greenspace in urban neighbourhoods and residents' health: adding quality to quantity. *J Epidemiol Community Health*, *66*(6). doi: 10.1136/jech.2009.104695

Villanueva, K., Badland, H., Hooper, P., Koohsari, M. J., Mavoa, S., Davern, et al. (2015).Developing indicators of public open space to promote health and well-being in communities. *Applied Geography*, *57*, 112-119.

Witten, K., Hiscock, R., Pearce, J., & Blakely, T. (2008). Neighbourhood access to open spaces and the physical activity of residents: a national study. *Preventive Medicine,47*(3), 299-303.

Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. *Landscape and Urban Planning*, *125*, 234-244.

Willemse, L. (2010). *Community/neighbourhood park use in Cape Town: A class-differentiated analysis*. (Unpublished doctoral dissertation).The University of Stellenbosch, Stellenbosch, South Africa.

Zhang, Y., van Dijk, T., Tang, J., & Berg, A. E. (2015). Green space attachment and health: A comparative study in two urban neighbourhoods. *International journal of environmental research and public health*, *12*(11), 14342-14363.doi: 10.3390/ijerph121114342

Zainal, N. R., Kaur, G., Ahmad, N. 'Aisah, &Khalili, J. M. (2012).Housing Conditions and Quality of Life of theUrban Poor in Malaysia.*Procedia - Social and Behavioral Sciences*, *50*(July), 827–838.doi:10.1016/j.sbspro.2012.08.0