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# Pre-School Children's Play Behaviour Influenced by Classroom's Spatial Definitions?

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## Abstract

Quality education is one of Malaysia's six KRAs (Key Result Areas) which has been accorded priority in the 2010 Budget, and in the planning of the 10<sup>th</sup> Malaysia Plan 2011-2015. Of interest is the RM100 million allocations under the 2010 budget to the Permata Negara programme which focuses on early childcare education. Despite this huge allocation, there currently appears to be a lot of emphasis on just the non-physical aspects of preschools. In more developed countries, the qualities of both the physical and non-physical aspects of preschool classrooms are given equal emphasis in providing quality education. Earlier research has established that the physical environment impacts children's behaviour and their progressive developments. Has the physical environment of Malaysian preschools attained a standard of quality on par with developed nations? Based on an ongoing research project which investigated the relationship between the physical environment of public pre-schools and children's play behaviour, this paper focused on the influence of the spatial definitions of the classrooms upon the children's play behaviour. Three types of spatial definitions in existing pre-school classrooms and the children's five types of play behaviours were investigated. The research design strategised on surveys, while the methodology involved a pilot study, the use of questionnaire surveys, natural unobtrusive observations with video recordings, structured interviews and Moore's (2008) Children's Physical Environment Rating Scale (CPERS). Overall, the data collected involved observations upon 494 children in 20 classroom settings from the 10 public pre-schools located at both urban and non-urban locations within the Klang Valley in Malaysia. Data were analysed using the SPSS statistical analysis. The findings revealed that spatial definition of the classrooms had a significant effect on the children's behaviours. Implications in the design of future pre-school classrooms were discussed.

Keywords: Pre-school classrooms, children's play behaviour, post-occupancy evaluation.

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## 1.0 Introduction

Malaysia envisioned becoming a developed country by 2020, with the emphasis on both first-class infrastructures and a first-class mentality. Already, she had moved away from being just a *Developing Nation* and has attained the *Newly Industrialised Country* (NIC) status in 2008 (Cheah, 2008). The most critical element identified towards the achievement of the national mission is on the quality of her human capital. That is why quality human capital development is a key thrust in the 9th Malaysian Plan (9MP, 2006-2010). In producing quality human capital development, the nation is currently focusing on every level of education starting from pre-schools. The emphasis is on the quality of education and training to be on par with international best practices (EPU, 2006, p. 237, 254).

More recently, Malaysia has identified six KRAs (Key Result Areas) which had been accorded priority in the 2010 Budget, and in the planning of the 10<sup>th</sup> Malaysia Plan, 2011-2015. Amongst those areas identified is quality and affordable education (Bernama, 2009). Of interest is the Permata Negara programme which focuses on early childcare and education and which had been allocated RM 100 million in the 2010 Budget recently announced. To date, the Permata programme, has been introduced in 457 childcare centres and promises to benefit 17,565 children (NST, 2009). However despite the huge allocation in Budget 2010 for the Permata programme, the emphasise seems to still be on just the non-physical aspects of pre-schools such as the children's' curriculum and the training of the pre-school teachers, without any mention on the improvement of the physical environmental aspects of the pre-schools.

Indeed, the importance of early childcare and education had been recognized much earlier, both locally and in the more developed nations. For example according to Raja Harun, et.al. (2005), pre-school education is critical years and forms the basis for ensuring success of an individual. In the West, Weinstein and David (2005) concurred that formal pre-schools contribute to cognitive development amongst Western children which leads to greater intellectual competence and cognitive maturity. But unlike in Malaysia, the more developed nations have given equal emphasis towards both the physical and non-physical environments of pre-schools. For example, Morrow (2007) stressed that the importance in preschools should not only concentrate on lesson planning but of equal importance, the spatial arrangements or physical environment. In fact, Moore (2008) concurred that it is already well known that the quality of pre-schools and the like is related to the quality of the physical designed environment.

Does the non-emphasis on the physical environment of Malaysian preschools in the 9MP and the forthcoming 10MP means that our pre-schools have attained the quality standard on par with those of other developed nations? What are the ingredients of a quality pre-school? Would emphasis just upon quality curriculum, quality training and on quality child psychology development - the non-physical environment aspects - alone suffice? Those seem to be the focus of the 9MP and are emphasised in most local literatures, such as by Sharani (2006), Raja Harun, et. al., (2005), and Majzub (2003). What

about the physical environment aspects, such as environment for human comfort, quality furnishings and finishing, spatial quality, and the creation of a conducive environment? Are not those factors of equal importance towards generating quality pre-schools? Those questions have prompted an ongoing research on which this paper is based.

### **Main Objective**

Based on an ongoing research project which investigates the relationship between the physical environment of public pre-schools and children's play behaviour, the main objective of this paper was to determine the influence of the spatial definitions of the classrooms upon the children's play behaviour.

## **2.0 Literature Review**

Many western-based studies (eg. Moore, 2008) have revealed the influence of the physical environment, both indoor and outdoor, not only upon children's behaviours and their development but also amongst adults (Abbot, 2001; Neuman and Dickinson, 2001).

In relation to the indoor spaces of pre-schools, studies have been conducted on the main aspects of human spatial behaviour - which Abbas (2000) identified as personal space / proxemics, territoriality, privacy and crowding. For example, Maxwell (2003) found that the girls' academic achievement was negatively affected by less space per student. The boys' classroom behavior was negatively affected by spatial density conditions, as they naturally require larger personal space as shown by much earlier studies, such as Sommer (1969). Still on the issue of space requirements and crowding, Kantrowitz and Evans (2004) found that the ratio of children to the number of activity areas in the classroom positively correlated with off-task time. There was also a marginal, negative correlation to engagement in constructive play. Han *et.al.*'s (2008) study on the territorial behavior of children demonstrated the advantages of being on one's own turf. Ahrentzen and Evans (1984) reported that students in classrooms with amenities for private study actually reported lower levels of privacy than those students without such classroom amenities. This unexpected finding may be due to limited access to these amenities even when present in the classroom. Children preferred to be in secluded study areas or comers when they wanted to be alone.

Pertaining to spatial definitions of classrooms in relation to children's play behaviour, earlier studies were conducted by Moore (1994, 2008) and Zimmons (1997). Those studies were based on quasi-experiments upon western pre-school children. Both studies found significant differences between areas within the classroom spatially designed to support prosocial interaction (cooperative play, social conversation) as compared to areas within the classroom not designed to support prosocial interactions. Their results indicated that when furnishings in the classroom environment created more spatial definition, children responded with more cooperative play and social conversation in spatially defined areas.

Other studies of the indoor environment included implications for the volume and wall colour, equipment, playroom arrangement, environment comfort, maintenance and safety. For example, Read, *et.al.* (1999) found that differentiation in ceiling height or wall color was related to higher levels of cooperative behavior among pre-school children. On the issue of space perception, Stankovic and Stojic (2007) reported that if some space is constructed and equipped in the right way, the development of a child's increased abilities gets supported, and this allowed the child's capacities to be confirmed by the child.

Pertaining to playroom arrangement, Legendre (1999) found that the type of furniture arrangement did not change the joint use of play areas and the social interactions for the peers whose relationships were weak. In contrast, for children showing an emerging relationship, the playroom arrangement affected the quantity and the quality of their social interactions.

The presence of major visual obstacles also markedly hindered their joint use of adult-distant areas, except for some children showing a particularly tight relationship. Ornstein (1997) studied the satisfaction levels of occupants (teachers, students, and employees) which involved functional factors, environmental comfort, maintenance, and safety regarding fire and crime. Knowledge of these performance environments during their use will lead to the creation of a database comprising project guidelines and parameters for preventive maintenance programs.

Implications of the physical environment on children's competency, and development have also been studied. For example, Maxwell (1996) developed a rating scale to assess the physical environment's role in the children's development of cognitive and social competency. He found that the physical environment is related to measures of competency. Mashburn (2008) examined associations between the quality of social and physical environments in pre-schools and children's development of academic, language, and literacy skills, and the extent to which pre-school quality moderated the associations between child risk and development. He found that high-quality social environments were positively associated with children's academic and literacy skills at the end of pre-school. He also reported that although the quality of the physical environment was not associated with children's outcomes at the end of pre-school. However, higher quality physical environments moderated the negative associations between income and academic development and between non-White race/ethnicity and literacy development.

### **3.0 Research Design**

This section is divided into two main parts. The first part explained the strategy chosen and offered reasons for the scope of study which focused on public preschools rather than the private pre-schools, the choice of the state of Selangor as the location of those pre-schools, and the inclusion of both urban and non-urban areas. The second part explained the methodology.

### **3.1 Strategy**

Due to the nature of the study, a non-experimental approach using repeated measures was implemented. The preschool differed in terms of preschool profiles, spatial definition, and student demography. Studies dealing with the preschool setting are best done on a case by case basis. Use of a multiple case-study approach is further supported by the nature of the research questions when "how" or "why" questions are being posed, (or) when the investigator has little control over other events in live situations (Yin, 1994).

There were several benefits of conducting this research at the public preschools in Selangor. Firstly, the Public Preschool Program is accredited by the Ministry of Education (MOE) for the Early Childhood Education program. Accreditation confirms that the preschool meets the highest professional standards needed for meeting the development and educational needs of the young children. Secondly, because the children were accustomed to seeing different people (e.g., undergraduate students, education personal officer) in their classrooms, our presence in the schools became less intrusive. The children were not inhibited in performing their routine behaviours. Thirdly, the children's parents were aware that the preschool was routinely used to conduct academic researches.

The reason for the choice of the state of Selangor as the location of the public preschools as against the other thirteen states of Malaysia was that the preschools in Selangor have become the point of reference for the other states, as stated by the Ministry of Education (MOE), and whatever data gathered can be assumed to represent the public preschools throughout Malaysia. Pre-schools located in both urban and non-urban areas were involved in the study for comparison purposes. This provided richer data for the analysis stage, particularly in relation to commonalities, differences and peculiarities between those both areas.

### **3.2 Methodology**

The methodology emulated previous studies done by Moore (1994, 2008), and Zimmons (1997). The present study was distinctive in that while both the previous studies were based on quasi-experiments on western children in one area, the present study was based on the natural settings of pre-schools in Malaysia, both urban and non-urban. The methodology involved two phases. The pilot study and the main study phases.

#### **3.2.1 Pilot Study**

The pilot study was more of a familiarization exercise for the researcher prior to conducting the main study. This involved four classrooms in two preschools randomly selected, representing both a new annex building (Figures 1.1 and 1.2) and renovated existing classrooms (Figures 2.1 and 2.2), with one located in the urban area while the other located in a non-urban area. The study served to obtain baseline information before the actual study began, allowed the researcher to understand the preschool environment in more detail, provide an opportunity to address and possibly control any unforeseen elements that could impact the study, and pre-test the questionnaires and instruments.

Prior to the study, permission from the Selangor Education Department, Ministry of Education (MOE) was obtained to conduct the survey in the respective public preschools. Appointments were then made with the headmasters and teachers. Data collection involved preliminary questionnaire distribution to the teachers, drawing the classroom layout, unobtrusive natural observations, video recordings, and photograph documentation of the children's behaviour and mapping their locations. Observations were recorded for the total duration of their 30-minute free-play period.

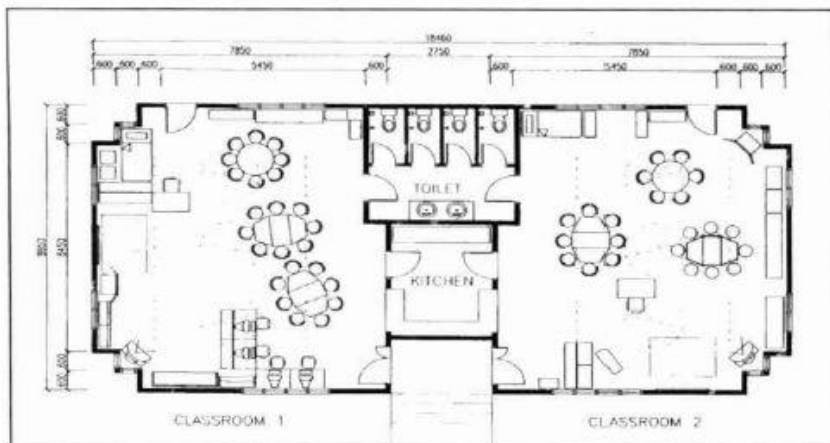


Figure 1.1: Example of layout floor-plan of new preschool building(annex building) with two classrooms



Figure 1.2: Front view of new preschool building (annex building) with two classrooms

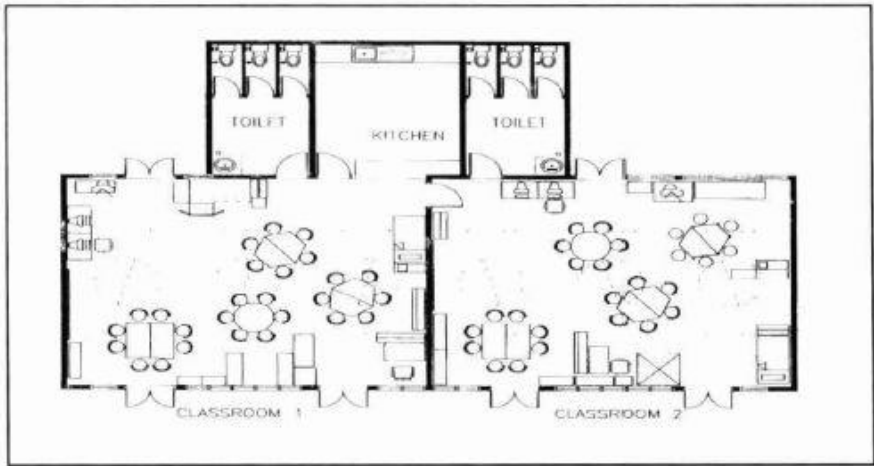


Figure 2.1: Example of layout floor-plan renovated existing public preschool classroom



Figure 2.2: Front view of renovated existing public preschool classroom

### 3.2.2 The Main Study

Prior to the main study, a few adjustments were made in the observation process as follows:

- a) Observation of the spatial behaviour needed to be extended to 15 minutes instead of 10 minutes. This is because of the time-sampling method adopted where it is split into 3 intervals of 5 minutes each.
- b) Behavioural-mapping of the children were required to be included in order to identify the spatial choice and location in the classroom during 'freeplay' time.

### 3.2.3 Social Behaviour: Categorisation

The social behaviours of the children were observed based on the categorization as shown

in Table I.

Table 1: Categories of childrens ' play / social behaviours

| Childrens' Play / Social Behaviour | Characteristics  |
|------------------------------------|--|
| 1) Appropriate Behaviours          | Social Conversation, Cooperative Play, Friendly Touch, Unilateral Bid, Teacher-Child, Solitary Play, Parallel Play, Onlooker, Transition, Unoccupied             |
| 2) Non-Appropriate Behaviours      | Argue, Rough Play, Object Possessiveness, Aggression, and Victim of Aggression   |
| 3) Interactive Behaviours          | Social Conversation, Cooperative Play, Friendly Touch, Unilateral Bid, Teacher-Child, Argue, Rough Play, Object Possessiveness, Aggression, Victim of Aggression |
| 4) Non - Interactive Behaviours    | Solitary Play, Parallel Play, Onlooker, Transition, Unoccupied   |
| 5) Neutral Behaviours              | Onlooker, Transition, Unoccupied   |

Overall, data collection took a period of 12 weeks each on the pre-schools located at the urban and non-urban areas. Those involved the observation of 494 children, aged 5-6 years, of proportionately equal genders, in 20 classrooms, from the 10 pre-schools located at both urban and non-urban areas.

#### 4.0 The Findings

Prior to the analysis of the data collected, expert opinion amongst 37 professional interior architects were sought to categories the classrooms involved in terms of the three types of spatial definitions in relation to the activity setting, categorized as well-defined, moderately-defined and poorly-defined (as suggested by Moore, 1986). Well-defined spaces are areas limited to only one activity, clear from circulation space and other activities, and with at least partial acoustic and visual separation. Poorly defined spaces involved areas where spatial definition is low, with inappropriate space for the group size, and work surfaces unsuitable for the particular activity. Moderately defined spaces are areas with characters between those two extremes. Samples categorized as opined by the interior architects were as shown in Figure 3.



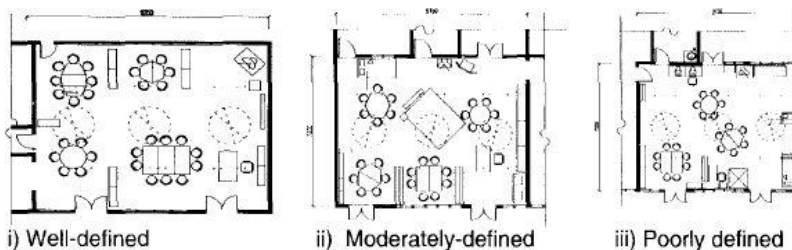


Figure 3: Examples of spatial definition category of classrooms

## Summary of Main Findings

### 1) Distribution of classrooms categorized.

Overall, a majority of 70% of the classrooms in both urban and non-urban locations were categorized as Moderately-defined, while 20% were categorized as Poorly-defined in the urban location, with a similar proportion being categorized as Well-defined in the non-urban location as shown in Table 2.

Table 2: Distribution of Categorised Classrooms According to Areas

| Classroom Spatial Definition | Overall (%) | Urban (%) | Non-Urban (%) | Similar | Different |
|------------------------------|-------------|-----------|---------------|---------|-----------|
|                              | N=20        | n=10      | n=10          |         |           |
| Moderately Defined           | 70          | 70        | 70            | √       |           |
| Well Defined                 | 15          | 10        | 20            |         | √         |
| Poorly Defined               | 15          | 20        | 10            |         | √         |

### 2) Social behaviours observed and analysed

a) Majority of all the five types of behaviours and gender interactions were observed in Moderately-defined classrooms at both urban and non-urban locations as shown in Table 3.

b) A comparison between the Well-defined and the Poorly-defined classrooms showed that much more of:-

- i) Appropriate Behaviours occurred in Well-defined classrooms in both urban (25%) and non-urban (31 %) locations
- ii) Non-Appropriate Behaviours occurred in Poorly-defined classrooms in both urban (25%) and non-urban (16%) locations
- iii) Interactive Behaviours occurred in Well-defined classrooms in both urban (23%) and non-urban (32%) locations

- iv) Appropriate Interactive Behaviours occurred in Well-defined classrooms in both urban (22%) and non-urban (38%) locations
  - v) Non-Interactive Behaviours occurred in Poorly-defined classrooms in non-urban (15%) location, while no difference was observed in urban locations.
  - vi) Gender Interactions occurred in Well-defined classrooms in urban locations (16%) while in Poorly-defined classrooms in non-urban (29%) locations
  - iv) Teacher-Child interactions occurred in Well-defined classrooms in both urban (76%) and non-urban (63%) locations
- c) The result of MANOVA as shown in Table 4 indicated that there was a significant difference in the number of occurrences of all type of behaviour between poorly-defined setting, moderately defined setting and well-defined setting classrooms in both urban and non-urban locations.
- d) A series of separate univariate ANOVA tests performed determined which one (s) of the five dependent variables when examined under independent variables, yielded a statistically significant result. The analysis showed significant results for the Appropriate, Interactive and Non-Interactive Behaviours in the classrooms categorized in both urban and non-urban locations, as shown in Table 4.1.

Table 3: Distribution of Categorized Classrooms in Relation to Social Behaviours

| Social Behaviours                    | Classroom Spatial Definition | Overall (%) | Urban (%) | Non-Urban (%) | Similar | Different |
|--------------------------------------|------------------------------|-------------|-----------|---------------|---------|-----------|
|                                      |                              | N=1131      | n=320     | N=811         |         |           |
| Appropriate Social Conversation (SC) | Moderately Defined           | 61          | 60        | 61            |         |           |
| Cooperative Play (CP)                | Well Defined                 | 29          | 25        | 31            | √       |           |
| Friendly Touch (FT)                  | Poorly Defined               | 10          | 15        | 8             |         |           |
| Unilateral Bid (UB)                  |                              |             |           |               |         |           |
| Teacher-Child (TC)                   |                              |             |           |               |         |           |
| Child-Teacher (CT)                   |                              |             |           |               |         |           |
| Solitary Play (SP)                   |                              |             |           |               |         |           |
| Parallel Play (PP)                   |                              |             |           |               |         |           |
| Onlooker (ON)                        |                              |             |           |               |         |           |
| Transition (TR)                      |                              |             |           |               |         |           |
| Unoccupied (UN)                      |                              |             |           |               |         |           |
|                                      |                              | N=235       | n=36      | N=199         |         |           |

|  |                       |        |       |       |   |  |
|--|-----------------------|--------|-------|-------|---|--|
| Non- Appropriate<br>Argue (A)<br>Rough Play (RP)<br>Object<br>Possessiveness<br>(OP)<br>Aggression (AG)<br>Victim of<br>Aggression (VA)  | Moderately<br>Defined | 70     | 69    | 70    |   |  |
|  | Well Defined          | 12     | 6     | 14    |   |  |
|  | Poorly Defined        | 17     | 25    | 16    | √ |  |
|  |                       | N=1027 | n=237 | N=790 |   |  |
| Interactive<br>Social<br>Conversation<br>(SC)<br>Cooperative Play<br>(CP)<br>Friendly Touch<br>(FT)<br>Unilateral Bid<br>(UB)<br>Teacher-Child<br>(TC)<br>Child-Teacher<br>(CT)<br>Argue (A)<br>Rough Play (RP)<br>Object<br>Possessiveness<br>(OP)<br>Aggression (AG)<br>Victim of<br>Aggression (VA) | Moderately<br>Defined | 60     | 62    | 59    |   |  |
|  | Well Defined          | 30     | 23    | 32    | √ |  |
|  | Poorly Defined        | 11     | 15    | 9     |   |  |
|  |                       | N=572  | n=156 | N=416 |   |  |
| Appropriate<br>Interactive<br>Social<br>Conversation<br>(SC)<br>Cooperative Play<br>(CP)<br>Friendly Touch<br>(FT)<br>Unilateral Bid<br>(UB)   | Moderately<br>Defined | 56     | 63    | 53    |   |  |
|  | Well Defined          | 34     | 22    | 38    | √ |  |
|  | Poorly Defined        | 11     | 15    | 9     |   |  |
|  |                       | N=466  | n=157 | N=309 |   |  |

|  |                    |       |       |      |  |   |
|--|--------------------|-------|-------|------|--|---|
| Non-Interactive Solitary Play (SP)<br>Parallel Play (PP)<br>Onlooker (ON)<br>Transition (TR)<br>Unoccupied (UN)<br>Other (O) | Moderately Defined | 70    | 60    | 75   |  |   |
|  | Well Defined       | 14    | 20    | 10   |  |   |
|  | Poorly Defined     | 16    | 20    | 15   |  | √ |
|  |                    | N=219 | n=130 | N=89 |  |   |
| Gender Interaction   | Moderately Defined | 66    | 76    | 52   |  |   |
|  | Well Defined       | 17    | 16    | 19   |  |   |
|  | Poorly Defined     | 16    | 8     | 29   |  | √ |

Table 4: Summary result of MANOVA Analysis

| Preschool location | Types of Behaviours | Spatial Definition Setting | N    | Mean  | Std. Deviation | F      | p-value | Sig |
|--------------------|---------------------|----------------------------|------|-------|----------------|--------|---------|-----|
| Urban preschool    | Appropriate         | Well defined               | 1    | 80.00 |                | 35.850 | 0.000   | yes |
|                    |                     | Moderately defined         | 7    | 27.43 | 4.54           |        |         |     |
|                    |                     | Poorly-defined             | 2    | 24.00 | 11.31          |        |         |     |
|                    | Non-appropriate     | Well defined               | 1    | 2.00  |                | 0.082  | 0.922   | no  |
|                    |                     | Moderately defined         | 7    | 3.57  | 5.44           |        |         |     |
|                    |                     | Poorly defined             | 2    | 4.50  | 0.71           |        |         |     |
|                    | Interactive         | Well defined               | 1    | 54.00 |                | 12.744 | 0.005   | yes |
|                    |                     | Moderately defined         | 7    | 21.00 | 5.94           |        |         |     |
|                    |                     | Poorly-defined             | 2    | 18.00 | 8.49           |        |         |     |
|                    | Non-interactive     | Well defined               | 1    | 28.00 |                | 18.521 | 0.002   | yes |
|                    |                     | Moderately defined         | 7    | 10.00 | 2.65           |        |         |     |
|                    |                     | Poorly-defined             | 2    | 10.50 | 3.54           |        |         |     |
| Neutral            | Well defined        | 1                          | 4.00 |       | 3.662          | 0.082  | no      |     |
|                    | Moderately defined  | 7                          | 3.43 | 0.79  |                |        |         |     |
|                    | Poorly-defined      | 2                          | 5.00 | 0.00  |                |        |         |     |

Table 4.1: Summary result of ANOVA Analysis

| Preschool location      | Types of Behaviours | Spatial Definition Setting | N     | Mean   | Std. Deviation | F      | P-value | Sig |
|-------------------------|---------------------|----------------------------|-------|--------|----------------|--------|---------|-----|
| Urban preschool         | Appropriate         | Well defined               | 1     | 80.00  |                | 35.850 | 0.000   | yes |
|                         |                     | Moderately defined         | 7     | 27.43  | 4.54           |        |         |     |
|                         |                     | Poorly defined             | 2     | 24.00  | 11.31          |        |         |     |
|                         | Non-appropriate     | Well defined               | 1     | 2.00   |                | 0.082  | 0.922   | no  |
|                         |                     | Moderately defined         | 7     | 3.57   | 5.44           |        |         |     |
|                         |                     | Poorly defined             | 2     | 4.50   | 0.71           |        |         |     |
|                         | Interactive         | Well defined               | 1     | 54.00  |                | 12.744 | 0.005   | yes |
|                         |                     | Moderately defined         | 7     | 21.00  | 5.94           |        |         |     |
|                         |                     | Poorly defined             | 2     | 18.00  | 8.49           |        |         |     |
|                         | Non-interactive     | Well defined               | 1     | 28.00  |                | 18.521 | 0.002   | yes |
|                         |                     | Moderately defined         | 7     | 10.00  | 2.65           |        |         |     |
|                         |                     | Poorly defined             | 2     | 10.50  | 3.54           |        |         |     |
| Neutral                 | Well defined        | 1                          | 4.00  |        | 3.662          | 0.082  | no      |     |
|                         | Moderately defined  | 7                          | 3.43  | 0.79   |                |        |         |     |
|                         | Poorly defined      | 2                          | 5.00  | 0.00   |                |        |         |     |
| Non-urban preschool     | Appropriate         | Well defined               | 2     | 125.00 | 7.07           | 25.466 | 0.001   | yes |
|                         |                     | Moderately defined         | 7     | 70.57  | 10.11          |        |         |     |
|                         |                     | Poorly defined             | 1     | 67.00  |                |        |         |     |
|                         | Non-appropriate     | Well defined               | 2     | 13.50  | 6.36           | 0.293  | 0.755   | no  |
|                         |                     | Moderately defined         | 7     | 20.00  | 21.17          |        |         |     |
|                         |                     | Poorly defined             | 1     | 32.00  |                |        |         |     |
|                         | Interactive         | Well defined               | 2     | 126.00 | 1.41           | 6.656  | 0.024   | yes |
|                         |                     | Moderately defined         | 7     | 66.29  | 22.10          |        |         |     |
|                         |                     | Poorly defined             | 1     | 74.00  |                |        |         |     |
|                         | Non-interactive     | Well defined               | 2     | 12.50  | 0.71           | 6.090  | 0.029   | yes |
|                         |                     | Moderately defined         | 7     | 24.29  | 4.64           |        |         |     |
|                         |                     | Poorly defined             | 1     | 25.00  |                |        |         |     |
| Neutral                 | Well defined        | 2                          | 3.50  | 2.12   | 0.254          | 0.783  | no      |     |
|                         | Moderately defined  | 7                          | 6.29  | 9.27   |                |        |         |     |
|                         | Poorly defined      | 1                          | 11.00 |        |                |        |         |     |
| Total preschool setting | Appropriate         | Well defined               | 3     | 110.00 | 26.46          | 8.798  | 0.002   | yes |
|                         |                     | Moderately defined         | 14    | 49.00  | 23.62          |        |         |     |
|                         |                     | Poorly defined             | 3     | 38.33  | 26.08          |        |         |     |
|                         | Non-appropriate     | Well defined               | 3     | 9.67   | 8.02           | 0.046  | 0.955   | no  |
|                         |                     | Moderately defined         | 14    | 11.79  | 17.12          |        |         |     |
|                         |                     | Poorly defined             | 3     | 13.67  | 15.89          |        |         |     |
|                         | Interactive         | Well defined               | 3     | 102.00 | 41.58          | 4.892  | 0.021   | yes |
|                         |                     | Moderately defined         | 14    | 43.64  | 28.17          |        |         |     |
|                         |                     | Poorly defined             | 3     | 36.67  | 32.88          |        |         |     |
|                         | Non-interactive     | Well defined               | 3     | 17.67  | 8.96           | 0.070  | 0.932   | no  |
|                         |                     | Moderately defined         | 14    | 17.14  | 8.25           |        |         |     |
|                         |                     | Poorly defined             | 3     | 15.33  | 8.74           |        |         |     |
| Neutral                 | Well defined        | 3                          | 3.67  | 1.53   | 0.260          | 0.774  | no      |     |
|                         | Moderately defined  | 14                         | 4.86  | 6.49   |                |        |         |     |
|                         | Poorly defined      | 3                          | 7.00  | 3.46   |                |        |         |     |

## 5.0 Discussions

The present study, similar though distinct from earlier studies done by Moore (1994, 2008) and Zimmons (1997) was based on natural settings of pre-schools upon Malaysian (eastern) pre-school children in two different located areas urban and non-urban. The main objective being in determining whether different types of physical spatial definition of pre-school classrooms influenced the children's play behaviour. Since influence of the physical environment upon human behaviour had been well documented in the literatures, this paper posited that more appropriate behaviours exhibited by the children could be the outcome of a better quality space provided.

Based on expert opinions, the classrooms involved in this study were categorized into three types of spatial definitions in relation to the activity setting, namely, well-defined, moderately-defined and poorly-defined. So, the better quality of space amongst those three categories of spatial definition could be determined by the frequencies of more appropriate behaviours exhibited in them by the children.

Based on the data collected, majority (70%) of the classrooms at both urban and non-urban locations were of the moderately-defined category. Since majority of occurrences for all the five types of the children's behaviours involved that category of classroom, the quality of such classrooms can be regarded as a mix between appropriate and non-appropriate behaviours, hence in other words, of average quality. Based on this finding alone indicated that majority of existing pre-school classrooms in Malaysia at both urban and non-urban locations were of average quality.

The data also indicated there were twice as much of the Well-defined classrooms in the non-urban location as compared to those in the urban, while also of similar proportion of the Poorly-defined classrooms in the urban as compared to the non-urban location. Despite this disproportionate distribution of the classrooms categorized at both locations, the analyses revealed that more appropriate behaviours were exhibited in the Well-defined while non-appropriate behaviours in Poorly-defined classrooms. Thus, it seemed that a Well-defined spatial definition classroom would inhibit more appropriate behaviours.

Those findings seemed to be similar to those found earlier by Moore and Zimmons which involved Western children. Hence, it can be deduced that despite their cultural differences, children would universally exhibit more appropriate behaviours in more Well-defined classrooms.

Important implications in those findings would be upon the design of future classrooms of pre-schools. Designers should create more well-defined spaces for the various necessary different activities in those classrooms so as to propagate and nurture more appropriate behaviours amongst the pre-school children.

It should be noted that two peculiar events which involved different behavioural patterns in classrooms between those at urban and non-urban locations. The first involved Non-Interactive behaviours which occurred much more in Poorly-defined classrooms in the non-urban location, while no difference in that behaviour in the classroom categorized was

observed at the urban location. In the non-urban location, it was not surprising, since the Interactive behaviours occurred much more in the Well-defined classrooms. Of concern would be the Appropriate Interactive behaviours, which occurred more in the Well-defined classrooms at both urban and non-urban locations as shown in Table 3.

The other peculiar event involved gender interactions. That event occurred much more in Well-defined classrooms in urban location, in contrary to non-urban location where it frequented much more in Poorly-defined classrooms. As analysis on gender differences is beyond the scope of this paper, surely it warrants further investigation.

## 6.0 Summary and Conclusion

In sum, this paper revealed, similar to Western pre-school children, those in Malaysia also tended to exhibit significantly more appropriate behaviours when spaces were more well-defined as compared to those which were more poorly-defined, at both urban and non-urban locations. As such, future designs of pre-school classrooms should provide more well-defined spaces for the various diverse activities in the classrooms. In addition, as the majority (70%) of the existing classrooms involved in this study was rated moderately-defined, in other words, of average quality, at both urban and non-urban locations, those should be upgraded to more well defined classrooms, if quality is of essence. Also, as this study was confined to just samples of pre-schools within the Klang Valley, it is suggested that future research involve samples of pre-schools nationwide.

This paper observed slightly different behavioural patterns as regards to gender interactions within the confinement of the spatial definitions categorized, between classrooms located at urban and non-urban locations. As analysis of this phenomenon is beyond the scope of this paper, it could be investigated further in future studies.

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