

## **CHAPTER 04**

### **THE CASE STUDIES**

This chapter is an explanatory section of the implemented case studies and the collection of data. The methods of data collection and analysis are described in this section and the way of managing the multi-source and multi-method data are discussed. The case studies are carried out to generate data on how outdoor play space in kindergarten playground influence children behavioural responses contributing to physical development or motor skill. The children play behaviour are measured based on the Theory of Affordances, introduced by Gibson (1979). Therefore, to value the research objectives, kindergartens with different types of outdoor setting are selected. The kindergartens are Tadika Islam Taman Tun Dr Ismail, Tadika Diyana, Tadika University of Malaya and Tadika Kemas Kenari.

## 4.1 Descriptive summaries of the case studies

### 4.1.1 Tadika Islam Taman Tun Dr Ismail, TTDI

Tadika Islam Taman Tun Dr Ismail (TTDI) was selected as one of the final case studies in this research. Tadika Islam TTDI is an Islamic base preschool for children from range age of four to six years olds. It is managed by Majlis Agama Islam Wilayah Persekutuan (MAIWP) with collaboration of Lembaga Pengurusan Sekolah Agama which is controlled by the residents of the area. The school hours are from 8.00am until 11.00am for morning session and 12.00pm to 3.00pm for the afternoon session, Mondays to Fridays.

The school has quite a wide play area consisting of playground with the play structure equipment, open space with asphalt in front of the main building, and covered area with stage attached to the school building. There are seventy children in the morning session who use the outdoor play area and twenty four in the afternoon session. Almost all of the children use the outdoor play space at the same time during half an hour of their break time every day. The building was a relinquished mosque to school building and situated next to a primary school building. Gated in quadrilateral form, the school also has flat topography and safeguarding by an in-house gardener.



Figure 4.1 : Tadika Islam TTDI's outdoor play area.

#### 4.1.2 Tadika Diyana, TTDI

Tadika Diyana is a residential, renovated to a school building. Develop by phase; the school is situated in the neighbourhood of the luxury houses area and next to the shop houses. It is also near to the main road that makes it accessible. It is a Montessori kindergarten for high-end class with extra facilities such as computer room, library, and culture room. It is managed by private company named Akar Serantau Sdn. Bhd. The school hour is operating in two sessions from Mondays to Fridays. The first session starts at 8.00am until 11.30am while the afternoon session begins at 1.00pm and lasts at 4.00pm.

Providing early education for children from range age of four to six years old, this kindergarten place the outdoor play space in the middle of the school area, with field and fenced by shrubs and palm. Playground structure is located under roof and ground by rubber mate floor. Other attribute such as vegetable plot area, fish pond with water feature, a replica of Malay house, potted plant, lawn and tortoise pond also constitute the school environment.

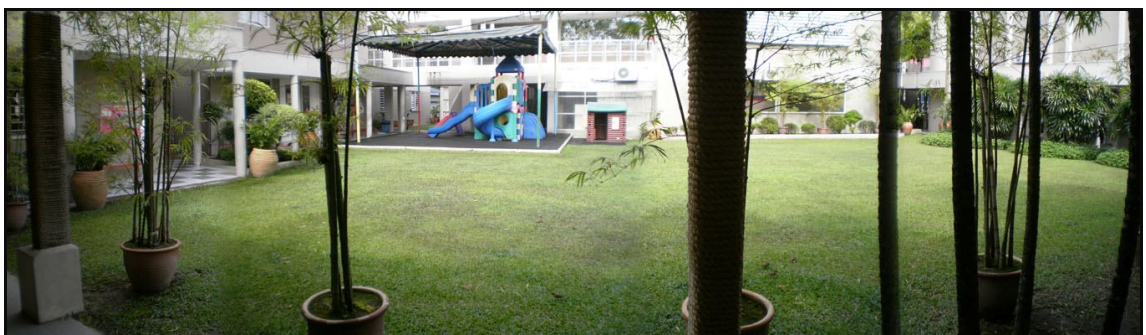


Figure 4.2 : Tadika Diyana's outdoor play area.

### 4.1.3 Tadika University of Malaya, Seksyen 16, PJ

Tadika University of Malaya or known as TadikUM is situated in the staff residential area with greenery surrounding. It turned two bungalows to be a kindergarten and is operated in two detach units. The first house allocates classes for children of four and five years while the other one is for the management office and six years old children. The second house also is facilitated with music and art class. According to the principal, the purpose of separating the children by age is because the six year-old students need more attention to prepare them to go to the primary school on the following year.

It is managed by one of the university's society and is purposely established for staff's children. The school provides standard facilities for children from age of four to six years old. TadikUM operates in a single session and starts at 9.00am until 1.00pm on weekdays. The school area is inclusion of flat surface within the sloppy area. The playground is sited in front of the first building which place children of four and five years. The surrounding is serene with matured trees and bushy shrubs. The school maintenance is performed by in house gardener.



Figure 4.3: TadikUM's outdoor play area.

#### 4.1.4 Tadika Kemas Kenari, Taman Medan, PJ

Tadika Kemas Kenari (TKK) is one of the kindergartens managed by Ministry of Rural and Regional Development of Malaysia government which work under Community Development Department or known as KEMAS. KEMAS manage to provide early education for rural and suburb community by commencing Tadika Kemas.

Tadika Kemas Kenari was chosen as one of the final study cases is due to its physical criteria that meet the study requirement. Like other tadika kemas which provides standard facilities for children age five and six, Tadika Kemas Kenari also provides basic facilities with lowest fee as compared to other private kindergarten. This school is a non-residential, single storey building was developed within the terrace houses area for local resident. The maintenances work relies on volunteer and normally they are the local residents who love to take care of the school area.

It provides two sessions in a day and starts at 8.00am until 11.30am for the morning session while for the afternoon session begins at 11.30am and ends by 3.00pm. The school topography is flat and the playground is located besides the school building with flat asphalt surface. The school environment is composed by shrubs and palm as welcoming, open space for group activities, gazebo/shelter, bird house, and mini garden. The detail information of case studies was summarized in Table 4.1.



Figure 4.4: Tadika Kemas Kenari's outdoor play area.



Table 4.1: Summary of case studies

Site Study	Tadika Islam TTDI	Tadika Diyana	Tadikum, UM	Tadika KEMAS
<b>Type of building</b>	Relinquish mosque to school building.	Residential, renovated to a school building.	Residential turned into kindergarten, 2 houses were used.	Non-residential, single storey building
<b>Category</b>	Middle class kindergarten with standard facilities provided, manage by local authority.	High-end kindergarten, extra facilities such as computer room, library, culture room etc, private management.	Managed by university's society, provide standard facilities. Specifically for staff's children.	Government's kindergarten for low-end social class. Provide basic facilities with lowest fee.
<b>Student age</b>	Children from age 4 to 6 years old	Children from age 4 to 6 years old	Children from age 4 to 6 years old	Children from age 4 to 6 years old
<b>Maintenance</b>	In house gardener	In house gardener	In house gardener	Relies on volunteer effort
<b>Operating hours</b>	8.00 am – 11.30 am (morning session) 11.30 am – 3.00 pm (afternoon session)	8.00 am – 11.30 am (morning session) 1.00 pm – 4.00 pm (afternoon session)	9.00 am – 1.00 pm (one session)	8.00 am – 11.30 am (one session) 11.30 am – 3.00 pm (afternoon session)
<b>Location</b>	Situated adjacent to the school building and gated.	Situated in the neighborhood of the luxury houses area and next to the shop houses as well, near to main road and gated.	Situated in the staff residence area with greenery surrounding.	Developed within the terrace houses area for local dweller.
<b>Spatial location of the outdoor play space in relation to the buildings and context</b>	Situated at the back of the school building. Grassy, flat ground.	Sited in the middle of the school area, with field and fencing by shrubs and palm. Playground structure was located under roof and ground by rubber mate floor.	Located in front of the building (house 1). Flat surface within the sloppy area.	Located besides the building with flat asphalt surface.
<b>Properties and attributes (in this study, refers to individual behaviour setting)</b>	Open hall, shrubs, shady trees, open space with asphalt, seating and outdoor play structure.	Outdoor playground and structure, field, vegetable plot area, fish pond with water feature, replica of Malay house, potted plant, lawn and tortoise pond.	Shady trees, shrubs, lawn, play house, outdoor playground, sand pit, padding pool, steps.	Shrubs and palm as welcoming area, open space for gather activities, gazebo/shelter, bird house, and mini garden.
<b>Issue</b>	The play structure was very limited and some were fractured. Lack of grass area. Covered with asphalt which was dangerous to children while running. Plants require maintenance.	Children were not allowed to play or pass through the lawn or grass area. Their activities were mostly directed by the teacher and thus limiting the children movement.	It was operated in 2 separated house building. Children were allowed to free play and enjoy the sloppy ground in school area. There were a few deficiency such	Almost all ground surfaces were covered with tarmac and cement. The children safety in play is not considerable. Children are merely in contact to play structures during limited

	Children love to play at the back of school building since there was shadier and have sandy plot as well as more shrubs.	Small area to do free activities such as running and chasing instead of the building apron. The landscape was well designed however; it was restricted for beautifications purposes only.	as fencing breakage, wild bushes which were risky to the children.	time of 30minutes of break time, twice a week. Lack of shady area (shade tree) which makes the environment arid and inconvenience to play or do any outdoor activities. The landscape properties are unmaintained, for example the fish pond is fail and polluted. There is no specific boundary or fence to separate the kindergarten area from the neighborhood houses.
<b>Benefits</b>	Children like to use plants and shady trees as a hiding place. A wide area around the building gave advantage to children for running activities and plucking the leaves.	The garden/lawn is used as a quiet place for passive activities, such as reading and resting.	Children enjoy running, and play free activities in the kindergarten area since there are more shady area and the environment look conducive.	The gazebo in front of the school building is functioning as shelter to the children and parent during outdoor activities. There is a wide open space that is potential to promote to a better landscape modification.
<b>What users needs in their outdoor play area.</b>	More complex play element such as sand pit, water element, more plant to look greener.  Need consistence maintenance.	They are not complaining any difficulties in the school as the children and staffs are happy with the environment even though they are lack of exposure to the natural environment.	Need to do maintenance to some of their play element such as padding pool and sand pit.	More complex play element such as sand pit, water element, more plant to look greener.  Need consistent maintenance.

Table 4.1, continued.

## **4.2 Data Collection**

The data collection process involves the collection of pragmatic data from four case studies mentioned. The kindergartens were different in term of management system and teaching approaches which make their activities such as play time diverse. This is also influenced by the spatial arrangement, facilities as well as playground and outdoor landscape properties that they provide in school.

This section is divided into three parts including the approach of data collection, strategies of measurement, and levels of measurement. The case studies were selected based on the outdoor environment setting and landscape attributes in the play spaces. In order to evaluate the landscape features that provide children with play activities that contribute to physical skill, kindergarten with outdoors territory were chosen. The study evaluates the actualised affordances by the landscape categories: soft landscape, and hard landscape (natural and man-made) through multi source and multi method approaches.

### **4.2.1 Multi source and multi method approach**

According to the review and Theory of Affordance (Gibson, 1979), the overt and covert behaviours are direct responses of children to the functional meaning of the setting. In this study, overt behaviours of the kindergarten children evaluated through their play behaviour in the outdoor play spaces while covert behaviours measured from interviews with the teachers and staff. The paediatric psychological approach was employed to gather the data on children behaviours toward the landscape features (natural and man-



made) of the kindergarten playground. The approach is called multi-source and multi-method data collection (Holmbeck et al., 2002). It elicits data from three sources including children, teachers and staff, and from three methods, namely, observation, behaviour mapping, interviews and participatory project.

#### **4.2.2 Variables of children to measure**

Children from the range age of four to six were involved in this study. There are two types of pragmatic data of the children collected by the multi-source and multi-method approach. In this case, overt and covert behaviour as stated in previous section are collected. Firstly the behavioural responses toward the conditions and landscape features (natural and man-made) offered in the kindergarten playground and secondly, the opinion and perspectives from the teachers and staff. Overt behaviours is refers to the externalising behavioural data of children's movement or dexterity and covert was the internalising behavioural data of children and teachers' and staffs' perceptual judgments. Children physical behaviours in play activities are the main variables of children to be measured.

#### **4.2.3 Measurement Approaches**

The data was gathered from three measurement approaches: (a) behavioural mapping, (b) teachers semi structured interview and (c) children participatory drawing project. All the data were sourced by researcher and from the staffs through observing the

children play activities during their recess time. The activities of the measurement are summarized in Table 4.2 (page 71)

### **i. Behavioural Mapping**

Behavioural mapping measures the overt behaviours (movement) of the children experiencing with the natural landscape features and activities in the kindergarten playground. In other words, it illustrates the operational value of how the play spaces are utilised by the children. Therefore, it examines the physical functioning of the children. The observation was begun by mapping and observing the spatial location of kindergarten area and children's dexterity in each space. The play habitat was classified by zones according to the type of space as well as landscape properties and attributes offered in it. The zones also measured base on the preferred place to play and to be in depending on the frequency of use. The observation was done based on four timescales to record the children's activities (Golicnic, 2005; Hussein, 2009). The first period recorded was less than 1 minute, then, 1–2 minutes, followed by 2–5 minutes, and lastly more than 5 minutes. In order to avoid too much data packed into the one scaled base plan, it was planned to conduct the observation and behaviour mapping over thirteen separate thirty-minute periods (Golicnic, 2005; Hussein, 2009), on different days, for a week and at same times of the day. Therefore, careful planning and time management was needed in executing this data gathering. The strategy of observation was equivalent between schools and permissions from caregivers were requested before the procedure.

The observation was done during the day from July 13, 2010 to January 20, 2010 at 9:30am to 10:00am and additional session on 11.00am to 11.30am for 7 days in each school, an average of an hour per day. Each day covered one to three children. Positions of play and movement of an individual child were directly noted with symbols

(Hussein, 2009) on an A3-size kindergarten plan. Based on example of observation and behavioural mapping layout, each symbol represents every physical activities performed by kindergarten children while playing. For instance, walking or passing through action was identified by circle sign with an arrow headed for as a symbol. Date of observation and length of play in minutes were also noted on the plan. Later, the behavioural maps of the children were overlaid to form a composite behavioural map. The map illustrates the collective position and pattern of movement of the children (Moore, 1978) in the kindergarten play spaces. This means group of symbols suggests preference of children to the features or places. The phenomenon suggests that the landscape features and places have afforded functional meanings to the children.

In order to present the efficient data on children physical responses during observation and behavioural mapping period, some indications of measurement to determine the pattern of movement of the children created refers to Said's work (2006). Below are the indications of measurement to obtain data on children physical responses;

- i. Outdoor play area participated (ODP) - is the area in square meter or percentage of the area that a child has visited during the observation period.
- ii. Environment qualities engaged (EQE) – is the area that engaged with the occurrence and items of hard landscape (for example, hard surfaces, structures, attached objects, climbable features, etc); soft landscape (plants, animals, microclimate); and landscape furniture (seating, lighting bollards), which users have played with/in/amongst, encountered or visited during the observation period; and

- iii. Length of participation (LOP) - is the duration in minutes of a child play activities in certain place during the observation period.

In addition, behaviours of the individual child playing alone or in a group and weather conditions were extensively described in a field note.

## **ii. Teachers and Staff Semi Structured Interview**

This measurement strategy was done with the behavioural mapping observation. It elicited teachers and staffs opinion and view on children's physical functioning with the outdoor play space features during their play activities. Words from teachers and staffs were drawn out by asking the semi-structured questions on their perceptual judgments toward the conditions of the outdoor play space and the children functioning in play. The tools for elicitation process include interview guide, set of interview questions, A3-size kindergarten layout plan, tape recorder, digital camera and pen were utilized.

Prior to the interview sessions, firstly, the author introduced herself to the interviewees (teachers and staffs), and later explained the purpose of interviews and the objective of the research as a whole. This is to encourage the teachers and staffs to articulate their perceptual judgments towards children and outdoor play space that offered by school. Teachers and staffs were the actual observer since they were spending their time almost 8 hours daily in the school supervising the children activities during school time. The questions were put forward in a conversation manner rather than an interrogation (Hatch, 1995).

The interview comprised of a set of 10 semi-structured questions and divided into two sections (Appendix B):

- i. Section A on teachers and staffs personal data;
- ii. Section B on perceptual judgment towards children and outdoor play space that offers by school.

The personal data include name, age, position, and the length of service. This is to inspect whether the teachers or staffs have adapt with the school environment and the children behaviour in the kindergarten. The data of perceptual judgments or opinion were general view towards the kindergarten and it outdoor play space include (i) landscape features and outdoor play environment that benefits to the children's physical functioning, (ii) preference and aversion features or area by children, (iii) landscape properties in playground that encourage children to play, and (iv) their inspiration towards improving the kindergarten playground.

### **iii. Children Participatory Drawing Project**

The children participatory drawing project operates by eliciting the children perceptual responses experiencing the physical landscape through play and movement. This approach was assisted by teachers. This method was stimulated by Burke's work (2009) that has use the approach in her research work entitled '*My view of the playground: a participatory photographic project*'. This approach is one of the phenomenological study of children aims which is intended to clarify, describe, and interpret their unique forms of 'intentionality' that comprise a child's way of attending to the world (Burke, 2009).

The rationale of changing the approach by Burke (2009); participatory photographic project into a participatory drawing project is because of the some

consequences predicted, such as (i) cost of providing digital cameras, (ii) time constraint to teach each of the children to use the cameras. This intention also agreed by Thompson and Bales (1991) which characterized preschool drawing as a performance unfolding in time, in which speech and gesture, word and image, are intertwined. Thompson (2000) also has investigated dialogues among young children to show that the development of artistry is both personal and social, dependent not only on the child's intentions, but also on the extent to which those intentions are mirrored or deflected by the responses of others.

Children participatory drawing project was done after the observation procedure. As requested by the management of kindergartens, the drawing project was arranged to be place in the art class session for not disturbing the school schedule. Some kindergartens allowed the children to be taken during class session to participate in the drawing project. The children were gathered in outdoor area near to their play spaces and were given a piece of A3-size paper and pencil colours. Some of them brought their own. They were asked by teachers to draw based on their own imagination and interpretation of the playground and their favourite place to play in the kindergarten area. The children were allowed to go around the kindergarten area with teacher's supervision to find the suitable place or to have their own privacy for the drawing project. The children were given half an hour to draw 'My view of the playground: A participatory drawing project'. After an hour, they once again asked to be gathered in one place and listen to friend's justification on their own drawing. This is to evaluate their participation and gain some idea from what have they drawn during the session. The children's interpretation of drawing was noted as data. The drawing afterwards will be categorized by the frequency of character drawn. Figure 4.1 shows the example of children participatory drawing project. For example, child A, B, C and D have drawn clouds in their drawing project while child B, C, and F have drawn trees



in their drawing. Table 4.3 below show the example of frequency measured of landscape characters in children participatory project.

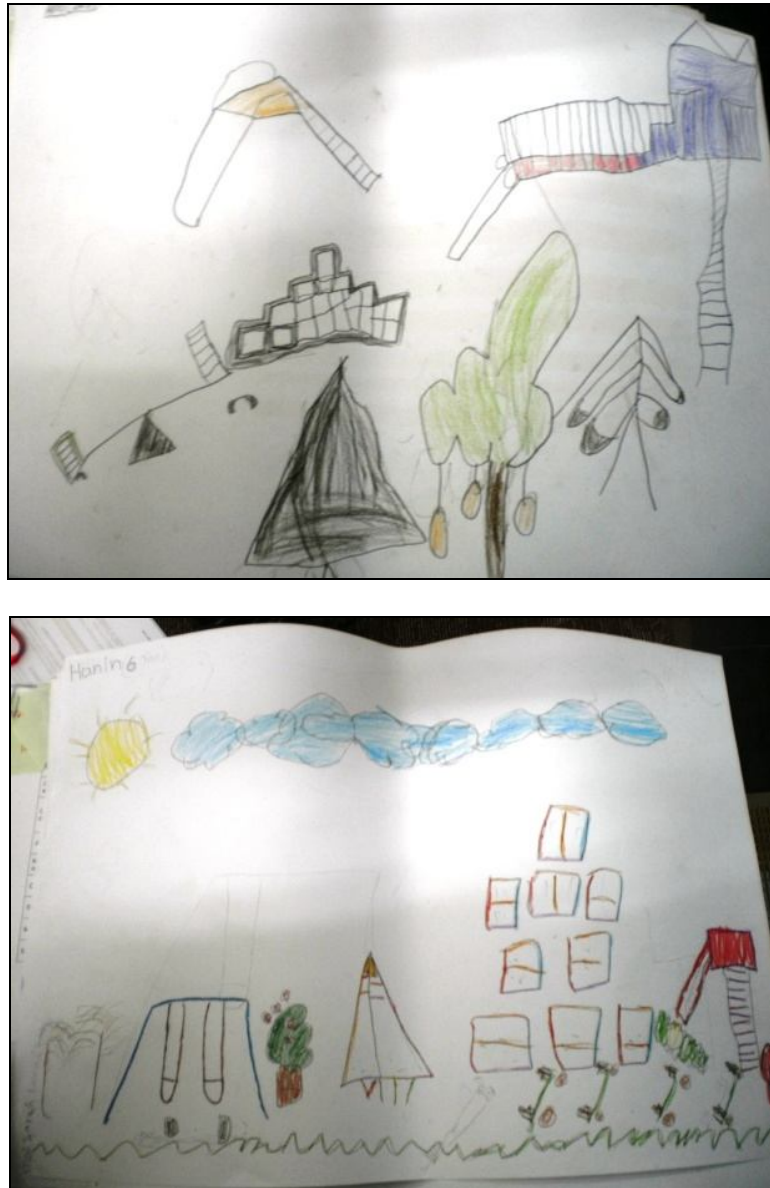


Figure 4.5: Examples of children drawing in participatory drawing project.

According to Kytta (2004), the environment has to provide something that the individual can perceive as offering the potential for activity, but the perception emerges only when the different characteristics of the individual, such as the child physical dimensions and abilities, social needs and personal intentions, are matched with the environmental features. This fact also agreed by Greeno (1994) that it is viable to see

affordances in terms of varying stages or levels rather than as either or phenomena. These actualized affordances (Heft, 1989) are the subset of the former that the individual perceives, utilizes or shapes (Kytta, 2002). Actualized affordances are revealed through actions of the individual, or through self-report. The present study interpreted children understanding of needs and desire of play spaces.

Table 4.2: Data collection approaches of four study cases.

Approaches	Numbers of respondent /kindergartens	Measurements of Behavioural responses	Tools	Analysis Methods
<b>Behavioural Mapping</b>	Tadika Islam TTDI	17	Movement	Kindergarten layout master plan, digital photograph, field notes.
	Tadika Diyana	8		
	Tadika UM	8		
	Tadika Kemas Kenari	26		
<b>Teachers and Staff Semi Structured Interview</b>	Tadika Islam TTDI	7	Perceptual/Judgement	Qualitative semi-structured questions, sound recording, and anecdotal notes.
	Tadika Diyana	20		
	Tadika UM	5		
	Tadika Kemas Kenari	2		
<b>Children Participatory Drawing Project</b>	Tadika Islam TTDI	17	Perceptual/Judgement/Expression in drawing	A3 size drawing paper, pencils colour, digital photograph, field notes.
	Tadika Diyana	8		
	Tadika UM	8		
	Tadika Kemas Kenari	26		

Table 4.3: Landscape characters appear in drawing

Category of Environment Characters	Landscape characters
<b>Natural elements</b>	<ul style="list-style-type: none"> <li>Tree</li> <li>Shrub/Flower</li> <li>Grass</li> <li>Ground/sand</li> <li>Boulder/pebbles</li> <li>Stick/branch</li> <li>Cloud/Sky</li> <li>Sun</li> <li>Animals (cat/bird/butterfly/bug etc)</li> </ul>

<b>Man-made elements</b>	Building/school Bench Gazebo/pavilion Flag pole Pond/fish pond/water feature Swing See saw Slide Merry-go-round Monkey bars
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Table 4.3, continued.

## 4.2 Data Analysis

The data collected from the behaviour mapping, semi structured interview and the participatory drawing project approaches are analysed by statistical and content analysis (interpretative) methods. Those approaches are named with; (A) Behavioural Mapping, (B) Teachers and Staffs Semi-Structured Interview and (C) Children Participatory Drawing Project. Quantitative data on physical responses behaviours that were measured in numbers are analysed using descriptive statistics (Said, 2006). The behavioural data were generally derived from approach A, behavioural mapping and C, children participatory drawing project.

Moreover, some data are in words, which are the perceptual judgments of the teachers and staff on the environmental conditions of the kindergarten playground as well as the children physical behavioural during play activities. These words were derived from approaches B and C. Later were analysed through an interpretative process which called content analysis.

According to the review and Theory of Affordance (Gibson, 1979), the overt or external behaviours are direct responses of the children to the functional meanings of

the settings. Therefore, the children behaviours are further analysed into three stages of affordances:

- i. ***Positive and negative affordances*** - This stage differentiates the preference or dislike of the children to the functional properties and attributes of the kindergarten playground. The preference indicates benefits and the dislike indicates adversities perceived by the children.
- ii. ***Levels of affordances*** - The second stage implies the activities of the children with the properties of the outdoor play space. The activities involved what they have been perceived, performed, explored and shaped. It differentiates the functioning of the children in the settings.
- iii. ***Taxonomy of affordances*** – taxonomy of affordance of the kindergarten playground that categories the performances of the children into 10 identified environmental qualities. The taxonomy differentiates the landscape features (natural and man-made) of the outdoor playground that afforded the most and least numbers of affordances, either positive or negative, to the children while playing. As a result, the taxonomy showed which landscape features (natural and man-made) of the outdoor play spaces contributed most to the children's performances.

### **4.3.1. Descriptive Statistics**

Descriptive statistics described the main features of a collection of data quantitatively. The aim of this method is to summarize a data set quantitatively without employing a probabilistic formulation (Dodge, 2003), rather than using the data to make inferences about the sample that the data are thought to represent. For example from the behaviour mapping approach, it determined the mean and range of length of children's participation in the outdoor playground and from the same approach; it determined the frequency and percentage of children participating in the play areas and at the play equipments.

### **4.3.2. Content Analysis**

Content analysis is a phenomenological analysis that analyses words or phrases rather than numbers (Miles and Huberman, 1994) from the teachers and staff to explicate patterns or regularities of children's behavioural responses while utilizing the outdoor playground. The words are a source of well-grounded, rich descriptions and explanations of processes (Miles and Huberman, 1994) in the contexts of the kindergarten playground. The patterns, regularities or meanings can be represented as concepts, themes, categories, schemes, and dimensions (Patton, 2002; Shi, 1997). Therefore, the process is called pattern or theme analysis (Patton, 2002). In statistical view, it is an analysis that classifies the words into much fewer content categories (Weber, 1990).

According to Patton (2002), this analysis refers to analysing the interview transcripts from the respondents rather than observation-based field notes. In other

words, it is an interpretive process to extract core meanings from the behavioural responses. Briefly, the process interpretation involves four steps (Ismail, 2006):

- i. Capturing the phenomenon of children's participation in kindergarten playground context, and obtaining their behavioural responses. For example, observing the play activities of the children in the outdoor playground will show their physical performances.
- ii. Bracketing or categorising the behavioural responses into essential elements and cutting it loose from the context so that its essential patterns or regularities may be distinguished. For example, the physical performances of the children are categorised into pattern of play or movement and dexterity.
- iii. Constructing the occurrences that involve putting the behavioural responses together in terms its essential parts, pieces, and structures. For example, the pattern of play suggested what kind of the outdoor playground features that the children have engaged to play.
- iv. Contextualising the occurrences in the kindergarten outdoor playground context. For example, a play pattern of lots of engagement with play equipment in the outdoor playground suggested the children are improving their physical performances.



### **4.3 Summary**

The data collected and analysed base on phenomenological approach with three major strategies; behavioural mapping, semi structured interviews to the teachers and staff as well as the participatory drawing project with the kindergarten children. This is to elicit the relationship of kindergarten children (aged 4 to 6 years old) with the landscape features (natural and man-made) of four different setting of kindergartens. Therefore, the research questions are divided into three major parts; (i) what kind of landscape features (natural and man-made) that can stimulate children's physical behaviour and performance in playing activities, (ii) how does the arrangement and setting in kindergarten's playground are able to encourage children's performance through play activities, and (iii) why landscape features (natural and man-made) are significant in kindergarten setting. Hence, this study is an experimental inquiry determining the effects of outdoor playground by comparing the performances of the children's physical behavioural responses. Using observational study as research design, the methodology obtains children performances by observing their external behaviours in the kindergarten outdoor play space settings. The research design appraises the behavioural responses of the children experiencing the kindergarten outdoor playground and the design views the children as a unit of analysis.