CHAPTER 05

ANALYSIS AND FINDINGS

This chapter presents the findings of behavioural responses of the kindergarten children in outdoor play space during their play activities in four case studies. The overt responses are the movement of the children and are considered as externalising behaviours (Gibson, 1979). The research anticipates that the children demonstrate active behaviours after experiencing the outdoor play space. Afterwards, the differences of the children's behaviours are further analysed into three stages of affordances, namely, taxonomy of affordances including the positive against negative ones, and levels of affordances (Said, 2006). The research expects that the landscape features (natural and man-made) provided in the kindergarten playground afford positive affordances in children play. Hence, the behavioural experience suggests an active performance, which can presently contribute to ways of enhancing some parameters in designing kindergarten playground in Malaysian context.

This chapter deliberate the case study analysis on its own merits and are analysed into three categories to explain the findings of children physical responses. The categories are set as follow:

i. Overt responses in kindergarten's outdoor play spaces,

ii. Affordances of the kindergarten's outdoor play space, and

iii. Summary of children performances in kindergarten's outdoor play space

5.1 Overt responses in kindergarten's outdoor play spaces

The overt responses of the children in the kindergarten's outdoor play space were observed in their physical play activities involving interaction and responsiveness with the play areas, play equipment and other landscape features, vegetation, animals and microclimate. The activities measured to facilitate children engagement with the outdoor play space settings and the richness of actions. The data presents in this chapter is in case by case and the findings are analysed decisively. To present the resourceful results and finding on children physical responses during observation period, some indications of measurement created refers to Ismail's work, 2006 (refer Chapter 4) such as outdoor play area participated (ODP), environment qualities engaged (EQE) and length of participation (LOP).

5.1.1 Play pattern in the play area

Observation and behaviour mapping strategy has produce data on site analysis and the facts of children participating in outdoor play area of four case studies. The data will be presented in percentage and zoning on illustration map and deliberate case by case basis. The data will shows the play patterns on play area follow by findings and discussion.

Certainly, each case study area has different types of play spaces offered to the children. This is due to the school development aspect as well as the management formation. For instance, Tadika Islam TTDI used to be a mosque and was relinquished to a school building. Likewise, Tadika Diyana and TadikUM was a residential and have been renovated to school buildings. Whereas, Tadika Kemas Kenari was built as low cost building intentionally to set up a kindergarten for underprivileged local people. These phenomena give different outcome of the spatial layout offered in school due to certain limitations. However, the spatial analysis discovers what has been offered in outdoor play areas of each school that is able to stimulate children physical performances. The results support this research in designing future prospect parameter in developing a better environment of kindergarten that can facilitate children development particularly in Malaysia.

i. Case study 01: Tadika Islam Taman Tun Dr. Ismail, Kuala Lumpur

The site investigated is a small area of kindergarten in Taman Tun Dr. Ismail, Kuala Lumpur. With built area 2021 meters square (m^2), the landscape pattern shows a combination of some open spaces of tarmac and playground with turf. The topography is flat with variety of vegetation includes palms, shady trees, shrubs and groundcovers. The single school building is located in the middle position and has two right of entry. Facing to the south east direction, the school obtains lush sun light on front side in the morning. The school has spacious outdoor spaces that offer easy moving for children to play. The following figures are the images of the outdoor play space and landscape pattern in the kindergarten area.

Figure 5.1: This image was taken from in front of the school building shows the original building and the patio was extended to be an open hall with stage on purpose for any school event.

Figure 5.2: A view of outdoor playground with some play equipment on turf area. The asphalt paving is an extension from the open hall.

Figure 5.3: The right side of the building always shaded by the rain trees.

To illustrate the play space, the layout plan as shown in Figure 5.4 is analyzed into spatial layout and was put into zone to show the criteria of each zone. From overall observation, the layout map indicates 8 zones base on play activities and children participation on site during their play time.

The identified zones were categorized by alphabetical codes. Those 8 zones offer in Tadika Islam TTDI are as follow; (i) A is a playground area covered by turf, (ii) B and E are open spaces with tarmac surface, (iii) C is an open hall and stage roofed, (iv) D, F and G was open lawn with shaded and (v) lastly H, is a small space with cement rendered.

Based on observation and behaviour mapping, there were some places that turn out to be most favourite place to play and to be in by the children. Children used some favourite places more frequently than the others in the kindergarten area. The behaviour mapping strategy has measured the frequency of used of specific zones. Figure 5.5 illustrates the percentage on frequency of use of certain zones.

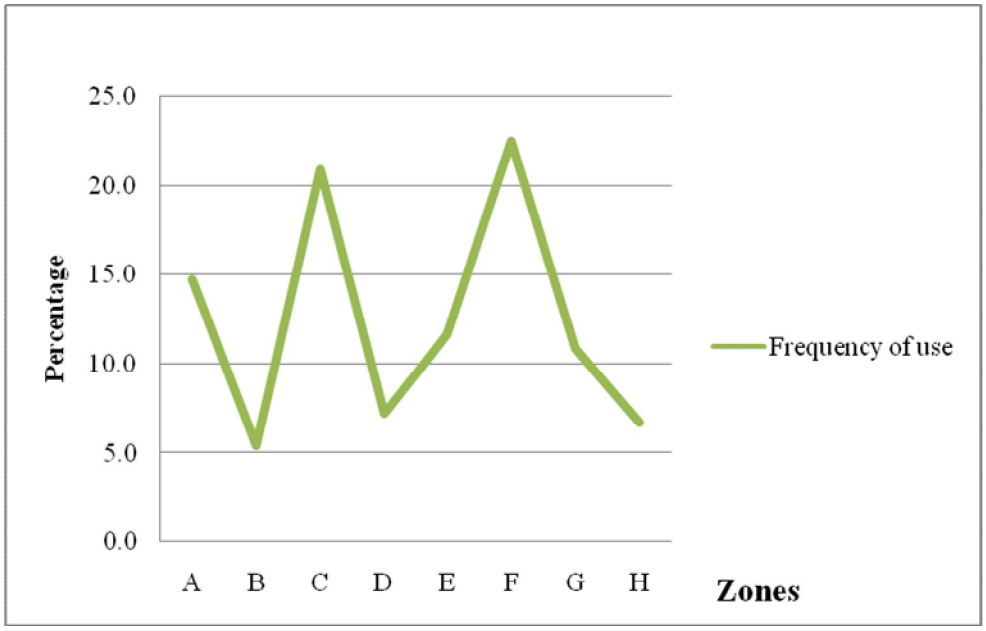

Figure 5.5: The line chart shows the play habitat of children during observation period.

From figure 5.5, it clearly shows that zone F obtains the highest percentage (%) of frequency of place exploitation during observation phase. The results point up that zone F becomes their favourite place in the kindergarten outdoor play space during observation period with 23%. Follow by zone C with 21% and the lowest percentage acquire by zone B which is 5%. During the behaviour mapping strategy, the specific activities were measured such as walking or passing through, walking fast, walking alone, walking together, walking and talking, stopping and standing, stop, stand and talking, sitting, sitting alone, sitting together, sitting and talking, running alone, running together, chasing and jumping. Those activities or behaviour of kindergarten children were plot on the A3 size of layout map by symbols (see Appendix C). The results afterward were tabulated into data before come out with percentage. The following table shows the data of frequency of use of places (zones), surfaces and equipments in outdoor spaces. The places (zones), surfaces and equipments measured also acknowledged as affordances of places, affordances of surfaces or affordances equipments which means the places, surfaces and equipment that afford children to

perform their active and passive actions during play. Table 5.1 shows the data obtain from behaviour mapping strategy during observation period.

Table 5.1: Affordances of zones offered in Tadika TTDI.

Actions	**Affordances *(place/surface/equipment)* x Frequency of use**								**Frequency of Actions (Affordances)**
	A	B	C	D	E	F	G	H	
walking/passing through	6	1	4	0	6	4	2	3	26
walking fast	3	3	6	0	4	4	2	1	23
walking alone	2	1	3	0	0	4	1	2	13
walking together	4	2	5	2	3	4	2	2	24
walking and talking	3	2	7	4	3	3	2	2	26
stopping/standing	2	2	5	3	3	6	2	3	26
stop/stand and talking	3	0	4	3	2	6	3	3	24
sitting	3	0	7	1	0	6	2	1	20
sitting alone	2	0	3	1	0	2	0	1	9
sitting together	3	0	5	0	0	9	2	0	19
sitting and talking	4	0	6	0	0	5	2	0	17
running alone	3	2	4	3	2	3	3	2	22
running together	6	4	8	5	9	11	9	3	55
chasing	7	4	9	3	8	11	7	2	51
jumping	6	0	5	3	5	9	3	1	32
Total	**57**	**21**	**81**	**28**	**45**	**87**	**42**	**26**	**387**

The children use some favourite places more frequently than the other in the kindergarten area. From Table 5.1 the desired area was zone F. It was shaded by big trees and the surface is a combination of turf and sand. There are also a few benches under the trees and single log laid across the benches that provides them an exploratory play space and social play in the kindergarten area. The varieties of landscape elements

(natural and man-made) in the play space offer multiplicity of choices for their activities. To illustrate this, during the observation period the children tended to climb up the log and jump from it. They also did this by taking turns. Some of them were walking on the log using their imaginative play and acted as if they are passing through a bridge. The benches and the log afford social play. Moreover, the children also enjoyed digging the sand and tried to put in the ground those small things that they had from ground. The shaded trees also afford shelter and hiding, social play and construction play. Some trees are suitable for climbing depending on the branching pattern, the stem diameter and the flexibility of the tree. Since the area is their play habitat, it clearly showed that the turf is almost worn out due to their activities. The sand gives the children more opportunity to play as well, and affords digging and social play. The following figures show the children activities in their favourite place.

Figure 5.6: The play space that represents specific play activities and become their favourite place to explore affordances.

ii. Case study 02: Tadika Diyana, TTDI

Tadika Diyana is a sophisticated kindergarten located at Taman Tun Dr. Ismail Kuala Lumpur. It is a residential building that has been renovated to a school building with overall acreage 4508 meters square (m^2). The landscape pattern consists of a few open spaces such as field, a small gardens, and paved area on a flat topography. The school had a good landscape design with variety of vegetation such as trees, palms, shrubs and groundcovers. The school has spacious outdoor spaces that offered diversity in play for children. The combination of natural and man-made landscape element afforded more activities by children. Figures below illustrate the landscape pattern and the outdoor play spaces of the school.

Figure 5.7: This image was taken from facing the school building shows the main building of the school.

Figure 5.8: The school field and playground area that are located in the middle of the site and bordered by school building.

Based on behaviour mapping strategy managed in the school, there were several spaces identified to illustrate the children behaviour responses during play. To exemplify the zone, the layout plan (refers Figure 5.9) was analyzed into spatial layout to show the criteria of each zone. From overall observation, the layout indicates 6 zones based on children activities and participation on site during observation period.

Those 6 zones offered in Tadika Diyana are as follow; (i) A is a pavement area used as car park, (ii) B is a walkway corridor along the school building. Zone (iii) C is a school field, (v) D is a canteen which all the furniture were design in a smaller size to suit children ergonomics, (vi) E is the playground equipment with roofed and rubber mates floor, and (vii) lastly F is a small garden on the south side of the school.

Based on observation and behaviour mapping strategy, there were some places that children love to play and hang about. This was derived from their activities and participation in active and passive play during observation period. Children used those preferred places more frequently than the others in the kindergarten area. The behaviour mapping strategy has measured the frequency of used of specific zones. Figure 5.10 below shows the percentage on frequency of use of the certain zones.

Figure 5.10: The line chart shows the play habitat of children during observation period.

The result in Figure 5.10 shows that zone B, a walkway corridor along the school building, obtains the highest percentage of frequency of place exploitation during observation period. It was created to make linkage from all the areas such as classes, canteen, field, school office and the hall included the family waiting area close to the hall. Children tend to use this area optimally because it offered flat and wide walkway corridor along the building. It was also the main route to connect each place. For instance, children used the walkway corridor to walk together to the canteen during recess time, children chasing their friends on the walkway corridor during play and children walked in queue along the corridor from class to the hall to attend the

assembly. The results point up 31% on zone B which becomes the highest affordances offered to the kindergarten children during observation period. Followed by zone D with 29% and the lowest percentage acquire by zone A which is 2%. Zone D was a canteen that offered active and passive activities such as walking, running and jumping (active) sitting, talking, and watching (passive). During the behaviour mapping strategy, the specific active and passive activities were measured. Those activities or behaviour of kindergarten children were plot on the A3 size of kindergarten layout plan by symbols (see Appendix G). The results afterward were tabulated into data as follow. Table 5.2 shows the data obtain from behaviour mapping strategy during observation period.

Table 5.2: Affordances of zones offered in Tadika Diyana.

Actions	**Affordances *(place/surface/equipment) x* Frequency of use**						**Frequency of Actions (Affordances)**
	A	B	C	D	E	F	
walking/passing through	0	8	2	7	9	0	26
walking fast	0	4	1	4	6	2	17
walking alone	0	7	0	4	6	0	17
walking together	0	7	2	6	10	2	27
walking and talking	2	5	0	3	5	0	15
stopping/standing	0	4	3	4	5	2	18
stop/stand and talking	2	5	3	7	4	2	23
sitting	0	5	0	12	2	0	19
sitting alone	0	3	0	6	2	0	11
sitting together	0	7	0	4	2	0	13
sitting and talking	0	5	0	5	2	0	12
running alone	1	5	2	5	3	2	18
running together	0	6	3	4	3	2	18
chasing	0	8	3	6	4	2	23

jumping	0	6	3	3	6	2	20
Total	**5**	**85**	**22**	**80**	**69**	**16**	**277**

Table 5.2, continued.

The result clearly shows that children being more responsive in play activities when it comes to spaces that could offered them easy moving and exploration. In this case, children preferred to be active on flat surface and in the shade area. The children use some favourite places more frequently than the other in the kindergarten area. From Table 5.2 the result shows that the desired area was zone B and followed by zone D. The two places that obtain highest sum in frequency of use were walkway corridor and canteen area. Basically, the walkway corridor offered flat and wide surface to perform active activities whereas canteen offered seats and out of the sun that can afforded both active and passive activities.

During the observation and interview, children were prohibited to walk on grass unless during physical exercise (PE) session and any outdoor activities arranged by teachers. During the PE session, children were allowed to play only on the field and using exercise tool provided. Besides, if the class teachers had planned for something outdoor such as tree planting, in that case they were allowed to go to the garden at the back of their class. Other than arranged session, children were advised to keep off the grass. This phenomenon has limits the children tolerance in play behaviour. There is a large body of literature indicating substantial benefits for health and wellbeing derived from contact with nature and exposure to natural environments (Maller et al., 2008). Hart (1979) also agreed that experience the landscape is a phenomenal process in children participation with the natural and manmade elements which contribute to their cognitive, affective and evaluative maturation and development (Kellert, 2002).

However, children are born curious. They have an innate motivation to explore and learn through cause-effect interactions with their surroundings (Graue and Walsh, 1995). Thereby, children still utilized the preferred place to make contact with environment. For instance, children had a tendency to sit on the stool at the canteen and watched peer performed their PE. Some of them just sat and watched the birds perching on the grass to feed. The observable fact explained that canteen afforded shelter to children while stool at the canteen afforded children to sit and watch. Moreover the space also contributes to social behaviour between peer. This is one of the positive affordance occurred in zone D as explained in Chapter 2 (page 35).

iii. Case study 03: Tadika University of Malaya (TadikUM), Seksyen 16, PJ

Tadika University of Malaya or recognized as TadikUM is managed by university's society called PERKAUM. It provides standard facilities like any other kindergarten. TadikUM is developed specially for university's staff children. Operated in staff residential area within the campus, TadikUM make use of two double storey bungalow house produce to be a kindergarten. The overall built up area of the school is 2347 meter square (m^2) was laid on the sloppy topography. Surrounded by shady trees and shrubs create a greenery landscape pattern on the school area. It also comprise green open spaces are refers to lawn area. The undulating landscape also offered more exploratory activities to the kindergarten children such as catching spider and bugs, plucking leaves and then arranges it according to their size etc. Figures 5.11 to 5.13 give an impression of the school environment.

Figure 5.11: Lawn in front of the second house is one of the children preferred places to play.

Figure 5.12: The uneven landscape pattern show diversity in landscape design.

Figure 5.13: An assortment of playground equipment offered diversity in play behaviour.

Through conversation with the teachers as well as observation done on TadikUM children, there are some places that being preferred to perform their activities. To illustrate the favourite play zone, the layout plan was investigated into spatial layout to show the criteria of each zone. From overall observation, the layout map indicates 4 zones based on play behaviour and children participation on site during their play time.

The identified zones were categorized by alphabetical codes. The total zones offers in TadikUM are as follow; (i) A is a playground area with rubber mate surface, (ii) B is a stairway that links the two houses. The third zone is (iii) C is an open lawn in front of house 2, and lastly (iv) D is also an open space on sloppy area.

Through observation and interview, it is found that children take pleasure in imaginative play. They love to play together on the steep area and open lawn. Teachers agreed that those places offered freedom for them to express their behaviour through free play. If they are given a chance to play feely, the children preferred to walk, run, jump, play balls on the lawn or play hide and seek between the shrubs. The children also love to sit and slide on the stairway that link the two building. The stairway was sheltered which afforded shade to the children. Children used zones B and C more frequently than the others in the kindergarten area. In addition, there was another place that gave the children some challenge which was zone D. Children also repeatedly use the space to play adventurous play such as climbed up the steep and slide down. However, only some children were courageous to play at this area. Normally, boys enjoy exploring this zone which might be challenging them. The behaviour mapping strategy has measured the frequency of used of specific zones. Figure below illustrates the percentage on frequency of use of certain zones.

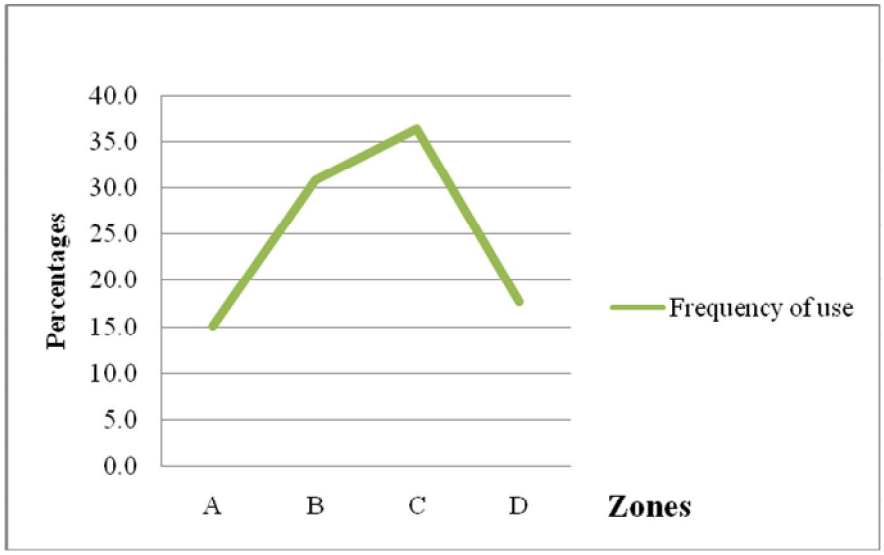

Figure 5.15: The line chart shows the play habitat of children during observation period.

From Figure 5.15, it shows that zones C and B obtained higher percentage as compared to zones A and D. The results demonstrated that zone C is becomes their play habitat in the kindergarten outdoor play space during observation period with 36%. Follow by zone B with 31% and another challenging zone which might be interesting to explore was zone D (18%). During the behaviour mapping strategy, the specific activities were measured such as walking or passing through, walking fast, walking alone, walking together, walking and talking, stopping and standing, stop, stand and talking, sitting, sitting alone, sitting together, sitting and talking, running alone, running together, chasing and jumping. However, there was some active behaviour which was notable such as climbing up the railing, sitting on the stairways, climbing up the steep area and sliding down as well as sitting and lies down on the sloppy area. Those activities or behaviour of kindergarten children were plot on the A3 size of layout map by symbols (see Appendix G). The following table shows the data on frequency of use of places (zones), surfaces and equipments in outdoor spaces. The places (zones), surfaces and equipments measured also acknowledged as affordances of places, affordances of surfaces or affordances equipments which means the places, surfaces and

equipment that afford children to perform their active and passive actions during play. Table 5.3 shows the data obtain from behaviour mapping strategy during observation period.

Table 5.3: Environmental Qualities that support Children's Affordance of TadikUM

Actions	**Affordances *(place/surface/equipment)* x Frequency of use**				**Frequency of Actions (Affordances)**
	A	B	C	D	
walking/passing through	4	8	10	0	22
walking fast	3	12	8	0	23
walking alone	4	8	7	0	19
walking together	2	8	6	0	16
walking and talking	2	8	6	0	16
stopping/standing	3	5	4	4	16
stop/stand and talking	2	6	5	2	15
sitting	2	5	6	6	19
sitting alone	1	2	2	4	9
sitting together	2	6	8	10	26
sitting and talking	2	4	8	8	22
running alone	4	2	7	4	17
running together	4	4	9	4	21
chasing	2	5	6	4	17
jumping	4	1	7	2	14
Total	**41**	**84**	**99**	**48**	**272**

Undoubtedly, children are keen on playing on space that offers challenge to them as well as easy moving. Chawla (1992) stated that children are attached to a place when they show happiness at being in it and regret or distress at leaving it, and when they value it not only for the satisfaction of physical needs but for its own intrinsic qualities. The results approved that children's positive affordances are at higher level

when they attached to their favourite place. From Table 5.3 the desired area which is zone C proved to be the most frequent place had been used by the children during observation. The place offered shades and flat surface that afforded children to walk, run, jump, chase, sit and explore more easy moving activities. Furthermore, zone B also became favourite place to perform social play and exploratory participation by climbing up the stairway's railing and jumping on each step of the stairs. Zone B offered shelter and different level which give the children imagination to play.

Figure 5.16: The children enjoy taking turn to climb up the railing.

iv. Case study 04: Tadika Kemas Kenari, Petaling Jaya.

Tadika Kemas Kenari is one of the government's kindergartens specially developed for underprivileged people. The kindergarten provides basic facilities such as playground equipment and small garden for teaching purposes. The garden includes birds' house, water fountain, pavilion and series of flowers and vegetations. The Tadika Kemas Kenari was build up near a residential area since as needed by an each area. The overall built up area of the school is 768 meter square (m^2) was developed on an even topography. This school is the smallest size in this study case. The landscape pattern

shows a combination of some paved open spaces. The open spaces comprised of *sepak takraw* court, asphalt area, and cement rendered. The vegetation appears to be short that turn the school environment looks arid. Figures below picture the school environments.

Figure 5.17: Front side of Tadika Kemas Kenari shows the water fountain and vegetation prototype in the school area.

Figure5.18: The landscape pattern that comprises of asphalt, and *sepak takraw* court in the middle of school area.

Figure 5.19: The typical playground equipment and garden bench next to it were place on the outdoor playground.

During observation and interviews session, the children are merely contact to play structured and outdoor environment for twice a week, which is on Tuesdays and Thursdays. During the session called physical exercise (PE), they were allowed to stay outside for limited time of 30 minutes starting 9.30am to 10.00am. The PE session was directed by teachers and normally will start with a short assembly in the middle of the outdoors space (court). The limitation of time was obstructing the children activities during play time. Due to all ground surfaces were rendered with tarmac and cement the children safety in play was not taken into consideration at the first place. In addition, teachers agreed that every single outdoor activity will be monitored to take care of children safety. The outdoor environment with hard surface and lack of shady area (shade tree) turn the school area looks arid and inconvenience to play or do any outdoor activities though the landscape offered flat surface that afforded many active activities in children. More to the point, the landscape properties are not in well maintenance, for example the fish pond is stop working and polluted, the birds' house was abandoned and the mini garden was grow with bush. There was also no specific boundary or barrier to separate the kindergarten area from the neighbourhood houses. Figure 5.19 shows some deficiency in the kindergarten area during observation which contributed to the lack of opportunity for children to explore more activities.

Figure 5.20: Some deficiency and lack of maintenance to landscape features in school area which lead to inert place for children to play.

Although this situation happened to this school, children still have intention to discover the school area while they were asking to go at will. According to behaviour mapping data, there are three main categories of spaces that had been visited by children during observation. The space was identified by zone on the layout map below.

The identified zones were categorized by alphabetical codes as follow; (i) A was a playground area equipped with play structure on tarmac and cement rendered. The intention to locate the play structure in this area was because of sheltered by trees. The next zone, (ii) B was an open space includes the *sepak takraw* court and asphalt area. In this zone, there was birds' house and mini garden or farm which was left undefended. The third zone, (iii) C was a space positioned in front of the school building. This area included the building corridor (roofed), planting and flag pole area, water fountain and a pavilion. The site was rendered with tiles and cement. The pavilion in front of the school building is function as shelter to the children and parent while outside. The graph below shows the frequency of affordances of each zone during observation period.

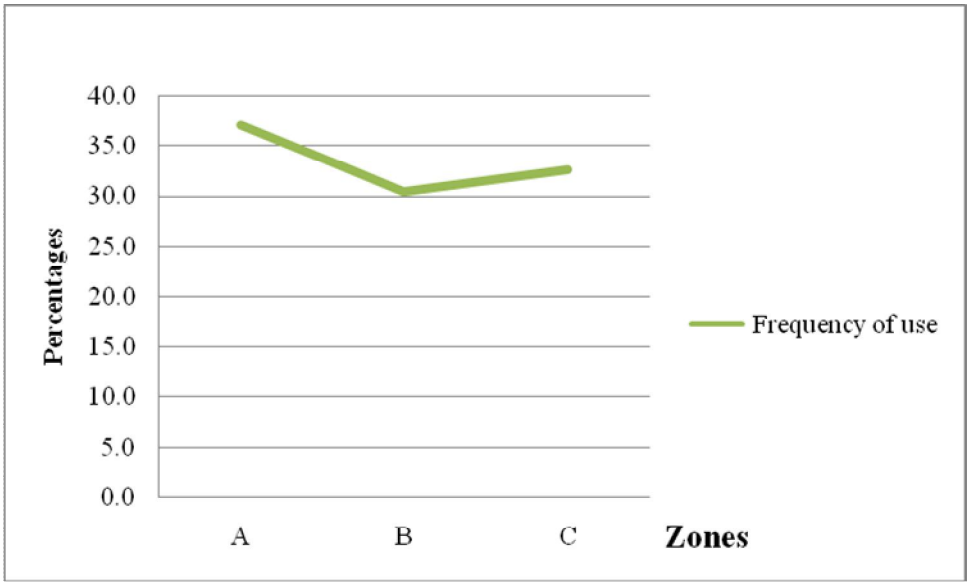

Figure 5.22: The line chart shows the play behaviour of children during observation period.

Figure 5.22 above illustrates that zone A was used commonly by the children in which 37%. The reason why did zone A obtain the highest rating also has been generalized before. The play structure was located in zone A which obviously being a central to the play behaviour. In this case, the school does not offer any landscape feature or

properties and attributes to stimulate children play instead of play structure. Furthermore, children are not allowed to go at will during the play time and behaviour mapping strategy. However, trees planted along the back yard afforded shelter to the children while playing. The flat surface also allowed them to move easily.

In contrast, zone B gain the lowest rating in frequency of affordances (30%). This is due to the climatic factor that turns the place become dry and hot to be in. However, the flat surface of zone B afforded children to walk, run, jump and performs any active activities on it. The wide open space such zone B is potential to promote to a better landscape modification. The data of active and passive behaviour stated below to show the activities measured during observation strategy.

Table 5.4: Environmental Qualities that support Children's Affordance of Tadika Kemas Kenari

Actions	**Affordances *(place/surface/equipment) x* Frequency of use**			**Frequency of Actions (Affordances)**
	A	B	C	
walking/passing through	8	12	6	26
walking fast	0	8	5	13
walking alone	4	6	4	14
walking together	6	12	6	24
walking and talking	6	0	7	13
stopping/standing	10	0	8	18
stop/stand and talking	6	0	8	14
sitting	7	0	9	16
sitting alone	4	0	5	9
sitting together	5	0	6	11
sitting and talking	6	0	6	12
running alone	4	6	4	14
running together	6	9	0	15

chasing	6	12	0	18
jumping	6	4	0	10
Total	**84**	**69**	**74**	**227**

Table 5.4, continued.

5.1.2. Play activities

Data of children participating in play activities in the outdoor play area is based on both observation on behaviour mapping from approach A (behavioural mapping) and perceptual and judgments from approach B (semi structured interview with teachers and staff).

Table 5.5: Children performances in play activities according to approach B.

Teachers and staffs interviewed	Attributes of plays	
	Active play (%)	**Passive play (%)**
TTDI (n=7)	80.3	19.7
TD (n=20)	71.4	28.6
TadikUM (n=5)	79.0	21.0
TKK (n=2)	68.8	31.2

As can be seen, percentage of active play stands more than the passive ones. The result illustrates that the children were stimulated by the landscape features (natural and man-made) of the outdoor play spaces. It shows that the landscape features (natural and man-made) in the kindergarten outdoor play spaces affords many positive affordances that permits the children to locate themselves more freely in the outdoor spaces. In this study, children in four case studies performed their play behaviours dynamically in the specific zone that turn to be their favourite place. Those identified

zones or favourite place provides various types of landscape features incorporated natural and man-made. For instances, in Tadika TTDI, zone F becomes their favourite place to perform energetic activities like running, jumping, digging sand and hopping since the space provides a lot of affordances. The zone was shaded by big trees with a few benches under and a single log lay across the benches. Like a daily routine, when the break session begins, the children gathered in the zone to play together and enjoy exploratory play and social play in their own boundaries. Moreover, the varieties of landscape elements (natural and man-made) in the desire space offer diversity in play activities as well as social abilities. To illustrate this, children tended to perform such actions with peers like climb up the log and jump from it by taking turns. This was pointed up by teacher who witnessed the children activities when they attached to the outdoor play spaces.

> *"...I saw some children were surprise when they found branches. Perhaps they do not found it near their house and tend to play with it. Besides, I was surprise when there are some children who tend to swing their body at the climbing structure in the playground..."*
>
> *Mardiana Zaini*
> *Teacher, Tadika Islam TTDI.*

It appears that the kindergarten children were performing in high physical and social performance during play activities in their kindergarten outdoor play spaces. This is approved when teachers justified those children who being active in outdoors area become more active in the class rather than the passive ones. Teachers agreed that children who perform well during play time also smart in academic. This is based on responses from teacher in the interview session.

"...Children who are active will always easy to catch up the knowledge taught by teachers for example, they can answer any question with confident instead of children who are not active, they seem so passive receiving any knowledge taught by teachers. Plus, teachers are difficult to figure out their understanding in certain aspects. Energetic children are able to develop the mind faster as compared to the passive ones. Moreover, the relationship between teachers and children also is very important to encourage children to come to school and enjoy school activities as well as learning..."

Puan Zarina Md Sharif
Head of Teacher, Tadika Islam TTDI

The results was supported by Olds (1989) that enlighten such freedom of movement enables the children to assume different body postures, creates their own boundaries, accesses to diverse places, manifests power and explores their physical and social abilities. This is also agreed by the Head of Teacher from Tadika University of Malaya (TadikUM) who said;

"...The children utilized the slope area and slide optimally during playing. Perhaps they found that adventurous..."

Madam Marriane Rebecca de Souza
Head of Teacher, Tadika University of Malaya.

The classification of play activities explained in two following tables.

Table 5.6: The classifications of active activities in kindergartens' children.

Landscape features	Active activities	Quantity			
		TTDI	TD	TadiKUM	TKK
Lawn, sand and pavement	Running, walking, turning, digging, hopping, rolling, jumping, chasing, climbing etc.	77	22	63	42
Play equipment, benches, fishpond/water	Grasping, swinging, riding merry-go-round,	42	21	27	5

features, planting boxes,	taking turn, scooping sand, dumping sand, balancing on log, hiding, sliding, hopping, crawling, jumping, touching water, plucking leaves etc.				
Shelter: pavilions, patio, stage/hall, walkway	Running, chasing, jumping, taking turn, playing hide and seek, climb on the railing etc.	29	22	15	12
Vegetation and animals	Plucking fruit, flowers and leaves, searching spider, catching spider and butterfly, bending tree branches etc.	3	5	4	5
Total		**151**	**70**	**109**	**64**
Percentage (%)		**80**	**71**	**79**	**69**

Table 5.6, continued.

Table 5.7: The classifications of passive activities in kindergartens' children.

Landscape features	**Passive activities**	**Quantity**			
		TTDI	TD	TADIKUM	TKK
Lawn, sand and pavement	Sitting, watching, chatting, story-telling etc.	9	5	12	6
Play equipment, benches, fishpond/water features, planting boxes,	Sitting, watching peers, touching water, hearing sound etc.	16	11	7	10
Shelter: pavilions, patio, stage/hall, walkway	Resting, sitting, watching for peers, chatting, drawing etc.	7	8	3	10
Vegetation and animals	Shading under a tree, smelling flowers, touching tree barks, picking stones, watching birds, insects etc.	5	4	7	3
Total		**37**	**28**	**29**	**29**
Percentage (%)		**19**	**29**	**21**	**31**

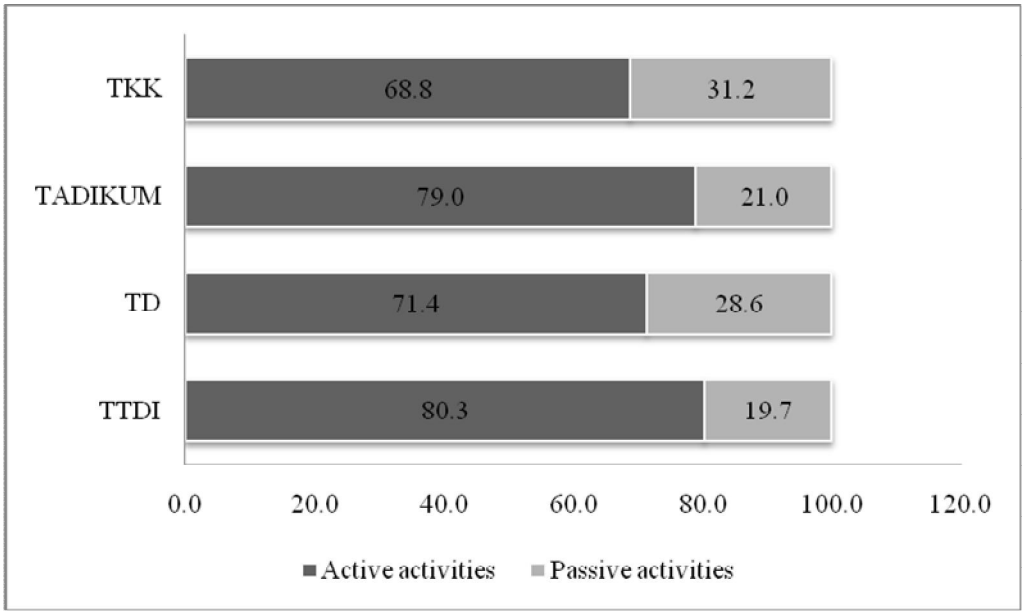

Figure 5.23: Percentage of active and passive activities performed during observation period.

From Tables 5.6 and 5.7, it is found that the total amount of play activities of four case studies. To clarify, bar chart in Figure 5.23 illustrates the percentage of active and passive activities performed by children in four cases during observation period. The classification of play activities were categorized into four major elements based on the environment qualities and landscape characters identified in behaviour mapping strategy. Some of the active play were running and walking on lawn, sand and pavement area, scooping and digging sand with chips and branches, hopping on sand, rolling on lawn, jumping, chasing with peers, balancing on log and bars, plucking fruit, flowers and leaves, searching and catching spider and butterfly, bending tree branches and many more. Whereas, the passive play activities consist of sitting, watching peers, chatting, story-telling, touching water, insect, and wind, resting, shading under a tree, smelling flowers, touching tree barks, picking stones, watching and hearing sound of birds, insects, wind etc. The figures below pictured the active and passive activities in TTDI kindergarten.

Figure 5.24: Example of active (left) and passive (right) activities in TTDI

In Tadika Islam TTDI the children performed 188 activities in which the active activities are 80% (n=151) more than the passive ones (n=37). The active activities are higher than passive ones due to the variety of spaces offered. Active activities on flat surface such as lawn, sand and pavement afforded the most number of activities. It allows children to move freely and performed energetic actions like running, walking, turning, digging, hopping, jumping, and chasing. Table 5.6 shows the percentage of active activities performed during observation period. The active actions performed 80% higher than other activities which engaged to play equipment and landscape properties, shelter and vegetation and animals. This appears that flat surface offers in TTDI such as lawn, sand and pavement affords children movement to the highest level. In addition, the extensive, flat surface in kindergarten outdoor plays area also contributing easy movement of the children during play particularly running.

From Table 5.7, passive activities like sitting on benches, stage and steps and watching for peer participation turn out more likely instead of chatting and other social play. Passive actions occurred on play equipment and landscape properties provided in the school with 43% (n=16). The results showed that children favoured to spent their limited time to watch others performances in strategic places. The sitting zone offered in school garden with shades affords children to sit and watch peer's performances.

Likewise case study two, Tadika Diyana (TD) gain total of 98 activities in which 71% are active activities (n=70) and the rest of 29% are from passive activities (n=28). The active activities occurred on flat surface and shelter shared the significant numbers of (n=22) which brings 31% of active activities performs during observation period. The same actions like running, walking, turning, digging, hopping, jumping, and chasing took place in this school. However, most of the activities were conducted by teachers. The activities engaged with play equipment were only 2% lower than the previous occurrences in which 30% (n=21) performances occurred. Performing on play equipment such as sliding, climbing, running, taking turn and hiding were favourite actions occurred. The school ground with flat surface and shady area affords children to play actively and socialized. However some school regulations have limited the dexterity of children in play. The following figures show the active and passive performances in the school.

Figure 5.25: Active (left) activities that were based on instruction and passive (right) activities like drawing in Tadika Diyana.

In order to keep the field and green element good looks, the school has limited the use of open spaces and green areas such as field and some other places that engaged to the natural elements. The children were only allowed to walk through corridor to

move from one place to another. This action has limited the children movement and exploration to attach with the natural element.

Furthermore, TadikUM has 109 active activities 79% more than the passive ones. Passive actions took the rest of 21% (n=29). Active performances occurred in the school ground surface about 58%. This was more challenging due to the school ground was sloppy. Children performed running, walking, turning, digging, hopping, jumping, chasing and sliding on the undulating surface in front of the school building and at the back yard. They also take turn to sit on the staircase that link the two buildings and also climbing up the railing and hanging up on it. One of the buildings was located at the upper level and the other one was in the lower ground. The buildings were link by covered stairway. The school environment that surrounded with matured trees and lush green vegetations gave an opportunity to the children to explore variety of play with the surroundings. On the other hand, children were more attracted to the undulating ground surface to explore different types of play such as associative play and cooperative play (Parten, 1933) rather than other occurrences such as play equipment and landscape features, shelter as well as vegetation and animals. The uneven surfaces afford children to be more active and generated diversity in play activities. The ranges of landscape features (natural and man-made) also encourage the children to utilize it according to their imagination.

Figure 5.26: Usual activities of children at TadikUM

Tadika Kemas Kenari (TKK) in addition has similar significant result of play activities which is active activities. The overall numbers of active actions were (n=64) which was 69% higher than the passive ones. On the contrary, the highest numbers happened on play equipment and landscape features occurrences. During the observation phase, play activities were mostly concentrated on play structure equipment. The children took their turn to climb up the structure to slide down. When they are on the top of the climb structure, they tend to touch the leaves from the tree that shading their play area. Some of them tried to pluck it. They became happy when there was someone who could touch or pluck the leaves. The play structure offered diversity in behaviour not only for climbing and sliding instead for touching, plucking, taking turn, jumping as well as socializing. The play structure affords diversity in play. Moreover, the area of play equipment located was shadier then the open space in the middle of the school. This is another aspect that the play equipment area was being centred by the children.

Figure 5.27: The children utilized the play equipment.

The second occurrences that took place as the favourite area to the children were the ground surface. The school has flat ground surface which can afford active activities like running, jumping, walking, hopping, chasing and so on. However, there was a large area which covered by tarmac that might limited the active activities such running and jumping due to safety. Plus, lack of shady tree also turn the school environment look arid and the active activities were focus on play equipment.

Figure 5.28: Almost half of the open space in the school area was covered by asphalt that restricted the play activities.

From the behavioural mapping, the active play such as running, jumping, walking, chasing and hopping on ground surface become most favourite actions in four case studies. However, the different ground surface contributed diversity of play. Flat surface encourage children to move easily whereas the undulating ones afforded more exploratory action. Moreover, when the surface was supported by shade, the activities turn out to be more interesting. The combination of social play and constructive play afforded a lot of movement and dexterity in children physical behaviour. The children were able to position themselves in different body postures and manifesting their powers. That is, the play equipment in the garden was affording the children with plenty of movement.

The finding shows similarity with the literature on children performances in outdoor environment, which suggests that early childhood children are curious and behaving actively with play features, and thus indicates that their physical performances is high (Olds, 1989; Striniste and Moore, 1989). The results advocate that the children were actively playing with the outdoor features particularly the landscape elements. It appears that the play mostly involve motoric activities which support the previous finding that the physical performances of the children in the outdoor play space was high. Gallahue (1993) state some examples of the physical exercise activities are grasping, jumping, running, pulling, rolling and crawling. Most of the activities occurred in the case studies were physical exercises and these activities are illustrating the dexterity of the children (Moore and Young, 1978) as well as showing the proficiency in their gross motor skills (Greig and Taylor, 1999; McDevitt and Ormrod, 2002). The children were experiencing an energetic performance tasks. Physically, the case studies afforded range play areas and a variety of plant species including trees, palms, shrubs and groundcovers. In other words, the content of the outdoor play spaces of each school were rich. According to Kaplan (1998) on environmental preference theory, that a garden with rich content is a complex setting which encouraged exploration. Studies on children relationship with outdoor environment by Olds (1989), Wachs (1989), Hartle and Johnson (1993) and Hart (1997), the complexity of the garden content afforded plenty of opportunities to the children for pleasurable, spontaneous and creative interactions.

The result suggests the children were stimulated by the properties and attributes of the outdoor play area. It appears that some outdoor play areas offered by each school were affording many positive affordances that permitted the children to locate themselves more freely in the outdoor play space. According to Olds (1989) such freedom of movement enables the children to assume different body postures, creates

their own boundaries, accesses to diverse places, manifests power and explores their physical and social abilities.

5.1.3. Dexterity of Children

Dexterity defines as skill or adroitness in using the hands or body. Said (2006) describes dexterity as the speed and accuracy of children's movement. The children's overt responses were analyzed in three measures which are outdoor play area participated (ODP); environment qualities engaged (EQE) and length of participation (LOP). According to the zone of play space categorized before, each kindergarten shows the range of children dexterity, children attachment to the play area and the length of participation in each zones based on environment qualities offered. The following figures show the dexterity measured in four kindergartens during behavioural mapping.

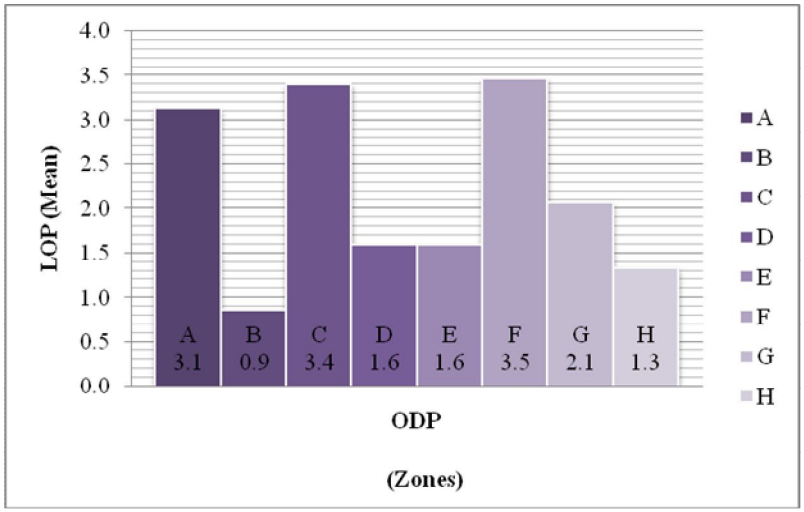

Figure 5.29: The outdoor play area participated (ODP) against Length of participation (LOP) of Tadika TTDI

Figure 5.29 shows the outdoor play area participated (ODP) against the length of participation (LOP) during behavioural mapping in the outdoor play area of Tadika TTDI. The bar chart indicate the LOP which is the duration in minutes of children participated in the kindergarten's outdoor play areas (ODP) with certain activities during the behavioural mapping survey. The length of time participation was measured according to the zones identified to discover the children favourite place to play during outdoor activities. During the behaviour mapping, timescale was draw on as a guide to measure the period of children participation in one place. The timescale was indicated as 1 = less than 1 minute, 2 = 1 -2 minutes, 3 = 2 - 5 minutes, and 4 = more than 5 minutes length of participation in one place and attachment with properties and attributes in the outdoor play areas.

As can be seen the highest mean LOP was in zone F which in 3.5 minutes. The variation of LOP between the children suggests different number of features utilised by the children. Long LOP indicates a child has a long duration of stimulation and feedback and vice versa. Long LOP may also be triggered by social play between a child with peer. Moreover, children participated as low as 0.9 minute to as high as 3.5 minutes in the outdoor play area. Children with high LOP suggest that they have interacted with many play equipments or landscape features (natural and man-made) as compared to the lowest LOP. In other words, the children were experiencing many functional properties of the outdoor features. However, the shortest time a child participated in outdoor space suggests dexterity of the child was rapid, that is, moving from one place to another within 0.9 minutes. It also indicates the child was curious towards the outdoor spaces contents and thus attended briefly with a feature and went for the next one. On the other hand, longer time spent on a feature would indicate low dexterity or high curiosity and fascination to the feature. Dexterity of the children to the

outdoor play space was also indicated that the area covered by children and suggesting he or she had visited almost the entire garden.

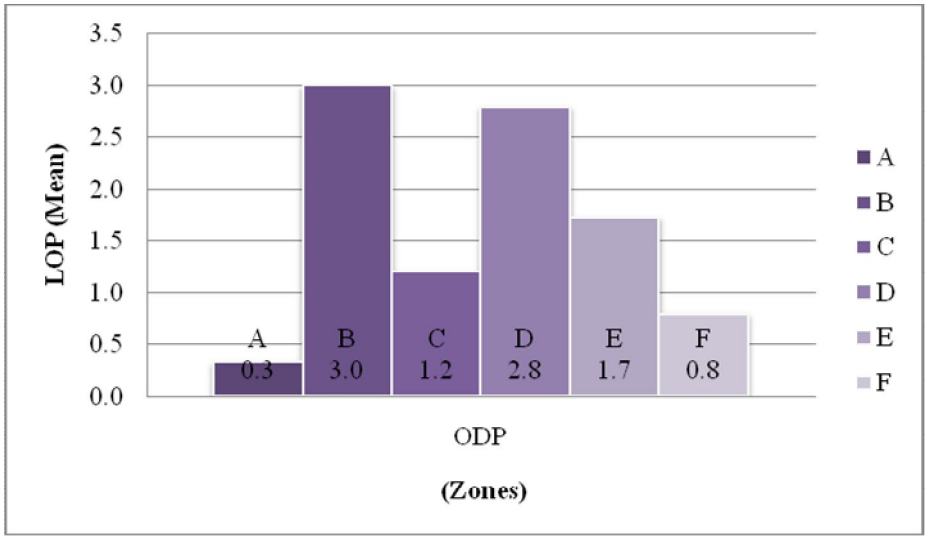

Figure 5.30: The outdoor play area participated (ODP) against length of participation (LOP) of Tadika Diyana (TD).

Accordingly, Tadika Diyana shows the highest mean of LOP is 3.0 which in zone B. Zone B is the corridor walkway area that linked all the places in the school area. Shelter and level surface being the most chosen since it offers easy actions like running, walking as well as passive activity like sightseeing. Children participate as low as 0.3 minutes that show less than a minute in the whole outdoor zones to as high as 3.0 units or more than 5 minutes.

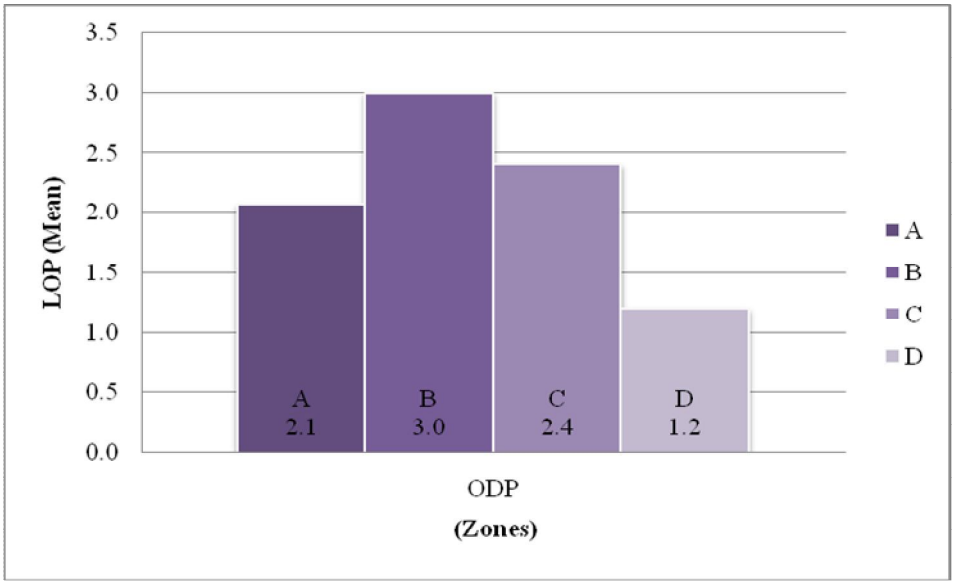

Figure 5.31: The outdoor play area participated (ODP) against Length of participation (LOP) of TadikUM

In comparison, children of TadikUM shows the highest time consumed are 3.0 minutes and the lowest time spent in outdoor play space is 1.2 minutes. Children love to spent time at zone B which they enjoyed hanging and sitting at the stairway that linked the two buildings of the school. Children performed sitting, socializing, chatting, including jumping, climbing on the railing and hanging at the zone. Zone B also function as meeting area for children from each building. The minimum time consumed was 1.2 minute which demonstrates that children spent more than a minute in the zone A, B and C. The rapid movement in children suggest that dexterity of moving from one place to another within one minutes or less. The children attracted further to the exploratory zone such as zone B as they participated with their active and passive activities as high as 3.0 minutes equivalent to 5 minutes or more.

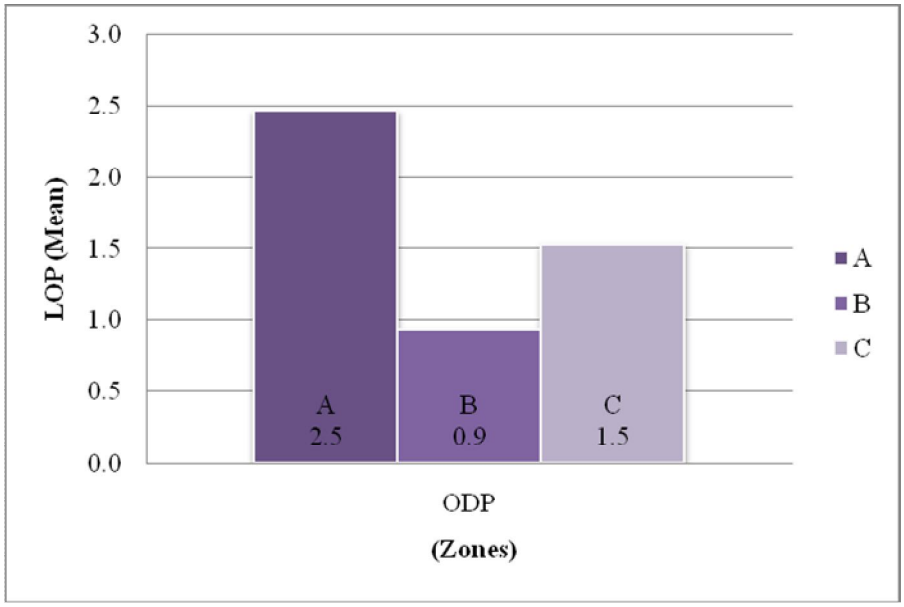

Figure 5.32: The outdoor play area participated (ODP) against Length of participation (LOP) of Tadika Kemas Kenari.

There were three outdoor play zone identified in Tadika Kemas Kenari (TKK) during previous finding in behaviour mapping. Analogous to previous data in play pattern and play activities in certain play area, the results from Figure 5.32 shows that zone A become most favourite place for children to play and to engaged in. The highest mean in timescale shows that children spent 2.5 minutes in this zone. Moreover, children participate as highest as 4 in units which mean they spent 5 minutes and more in zone A. Whereas, children use to be in zone B and C as low as 0.9 minute for zone B and 1.5 minutes for zone C. It appears that they utilized the space in quick movement as 1 unit or less than one minute to passing through from one place to another.

Findings verify that children are more likely to set in motion in outdoor play space which offers flat, smooth surface, shelter as well as variety of landscape features (natural and man-made). As Kytta (2003) stated that space of adventure and exploration that inspires them to move around and find even more affordances. This can be simplified that the climatic factor is the main reason why children like to be under shade. Rationally, children with a long participation in outdoor place involved with the

most number of features and visited the largest area of the garden. To give an example, in Tadika TTDI, a 5 years old boy spent more than 5 minutes (4 timescale) in zone F. He talks to peer while balancing his body on the log and then climbing up the benches. He then jumping down and start to dig the sand with branches he found close by. Then, he was running together with peer to the next zone; A passing through zones E, C and B. The boy has experienced almost 65% of the outdoor area with performed variety of affordances offered by the spaces. Hence, his experience offered him with several affordances. Therefore, the variation of affordances was partly linked to the physical ability of the children.

5.2 Affordances of Kindergarten's Outdoor Play Space

5.2.1 Level of Affordance

According to the review in chapter two, there are two levels of affordances: actualized affordances and potential affordances. The differences of levels of affordances in outdoor play space of each kindergarten are compared in descriptive and interpretative analysis.

In four study cases, results show high levels of actualized affordances and potential affordances. It means, through movement and perception, the children perceived the outdoor spaces afforded more benefits than adversities. This finding is parallel to the theory of affordances, which suggests that the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good and evil (Gibson, 1979; Kytta, 2003; Fjortoft, 2004). The graphs to illustrate the

actualized affordances and the potential affordances offer by the environment qualities in the case studies' play area are shown in appendix.

i. Potential Affordance

Potential affordances are the qualities of the environment that offers actualised affordances in children movement. In aspect of positive affordances, potential affordances can be looked at in relation to the individual, and described as a subset of potential affordances which exists for a certain individual and which is defined by the individual's qualities, such as children's physical skills or bodily proportions (Kytta, 2003). As such, the outdoor play space of Tadika TTDI potential affordances (n=8), Tadika Diyana (n=6), TadikUM (n=4) and Tadika Kemas Kenari (n=3) with various types of landscape character that promote performatory and exploratory activities involving play performances. Examples of the performatory activities were climbing slope, running of the lawn from play area to another, and riding the merry-go-rounds. Examples of exploratory activities were jumping, searching spiders at *ficus microcarpa* 'golden', balancing the body on a log and digging soil and finding worm. Linking to the findings in previous section, it seems clear that the children were responding actively with the outdoor play area properties and attributes. This finding is consistent with the literature on children experiencing outdoor spaces, which suggests that contact with the natural world, especially during early childhood, occupies an important place in a child's emotional responsiveness and receptivity (Kellert, 2002).

ii. Actualized Affordances

Actualised affordances give an idea of what the children encountered during their independent mobility, perception and engagement with the environmental features in the outdoor play area in each kindergarten. According to Kytta (2003), actualized affordances include (i) affordances that have been perceived, (ii) affordances that have been utilized, and (iii) affordances that have been shaped. In this context of study, the findings in earlier discussion approve that the actualized affordance of the outdoor play space in four kindergarten observed were positively shown. This is based on the affordances that children gain from the outdoor space during play activities such as walking and passing through, alone or with peer, running, jumping, chasing, hopping, balancing etc. To illustrate, the flat lawn affords children to run and chase friend. The findings again support the evidence that qualities, elements and characteristics of live environments stimulate and support manual dexterity and sensori-psych-motor, social-emotive, perceptive, imaginative, affective, cognitive and verbal skills in children (Moore, 1986).

5.2.2 Taxonomy of Affordance

According to the review, the behavioural responses of the children toward the affordances of the outdoor play area were categorised in a functional taxonomy based on Kytta (2003) and Heft (1999) taxonomies of the children's functioning in the outdoor environment. The taxonomy composed of 10 categories of affordances: (i) Flat, relatively smooth surfaces, (ii) Non-rigid attached objects, (iii) Graspable/detached objects, (iv) Attached objects, (v) Climbable features, (vi) Shelters, (vii) Vegetation and

animals, (viii) Water, (ix) Microclimate, and (x) Affordances for sociality. Data of the affordances in the kindergarten's outdoor play spaces are shown in Table 5.8.

Table 5.8: Affordances outdoor play space

Environmental qualities	Positive	Negative
Flat surface (lawn, pathway, playground area, asphalt open space)	Affords running, Affords walking Affords skipping, Affords crawling, Affords jumping, Affords walking fast, Affords hopping Affords chasing.	Affords stay long
Smooth/rough surface (sand, turf, asphalt, cement, and tiles rendered)	Affords running, Affords stepping, Affords skipping, Affords sitting, Affords jumping, Affords walking, Affords chasing, Affords standing.	None
Graspable/ Detached object (Animals: bees, butterflies, birds, bugs, cats. Plants: groundcovers, shrubs, palms, trees)	Affords catching, Affords burying, Affords watching, Affords looking, Affords communicating. Affords sniffing, Affords smelling, Affords plucking, Affords touching, Affords jumping over, Affords collecting, Affords searching etc.	Afford bitten by insect
Attached object (textured wall, boulders, bollard, wood edge etc.)	Affords touching, Affords stepping on, Affords balancing, Affords sitting, Affords hiding, Affords climbing on, Affords jumping from.	None
Climbable feature (log, balance beam, rock sculpture etc).	Affords touching, Affords stepping on, Affords balancing, Affords sitting, Affords climbing on, Affords jumping from.	None

Shelter (open stage, hall, pavilion, shady tree, canteen, corridor, building etc)	Affords hiding, Affords privacy, Affords passing through, Affords walking, Affords running, Affords sitting, Affords resting, Affords chasing.	None
Mouldable materials (sand, chipping, fallen leaves, twigs etc.)	Affords throwing, Affords digging, Affords moulding, Affords scooping, Affords scratching, Affords collecting etc.	Affords dirty hand
Water (water feature, paddling pool)	Affords splashing, Affords pouring, Affords sprinkling, Affords washing hands, Affords feeling water; Affords hand dipping, Affords throwing stones, Affords fear of getting wet, Affords touching, Affords squatting.	Afford slippery Affords wet
Microclimate (thunder, rain water, sun, wind)	Affords listening, Affords pouring, Affords sprinkling, Affords scooping, Affords feeling.	Affords wet Affords hot and arid
Total	**70**	**7**

Table 5.8, continued.

It clearly shows that the outdoor play area of each kindergarten afforded 70 positive and 7 negative affordances. Thus the outdoor spaces afforded 10 times more positive affordances to the kindergarten children. This appears that children's sensorial and motoric activities were more active with the outdoor properties and attributes. This finding is consistent with the theory of affordances, which suggests that functional properties of an environment are perceived through active detection of information (Kytta, 2003). Therefore, the large results of positive affordances suggests that the outdoor play areas were much contributing to children active performances particularly physical which will also promoting to children well being.

5.3. Summary of Children Performances in Outdoor Play Area

In summary, most children playing in the outdoor play area of each kindergarten of the four study cases were active playing with the features of the outdoor spaces suggesting that their physical responses increased and contributing to the more concentration in classroom. This is because the landscape features (natural and man-made) of the outdoor play area in each kindergarten afforded the children with 76% active and 24% passive activities; all are positive affordances (n=70). The properties that afforded the most affordances were the flat surfaces and shady area. However, as demonstrated by a few children, features such as play equipment and unintentional properties such as log and sloppy lawn also afforded positive affordances. The main factor that influenced the movement and dexterity of the children is physical ability support by social play. Physical fitness and playing with peers enabled kindergarten children to perform many tasks, play with many features, and cover large play spaces.