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DOUBLE – SHIFT SCHOOLS: ARCHITECTURAL STRATEGIES
TO FOSTER PLACE ATTACHMENT

A Thesis in
Architecture
by
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Double-shift schools are vehicles of change in developing countries such as India. Through efficient management of resources such as the school building and playgrounds, they are providing greater access to primary and secondary education, consuming fewer resources in terms of land usage and reducing costs of education. The system is beneficial economically as it cuts operative costs, however the reduction in cost comes at a significant price. The shift operation creates a crunched school day, lowers quality of education, creates conflicts of ownership of space between shifts and induces a feeling of detachment or lack of belonging to the school. This thesis delves into the question: Does the built environment of the double-shift school induce feelings of alienation; and if it does, then how can we as designers create better and more responsive spaces for the double-shift school.
The study was divided into three stages. First, the concept of alienation was grounded in theories of place attachment. It was found that the environment acts as a vehicle through which the attachment processes are manifested and fosters positive self and communal identity. Through the process, people (children), processes (act of appropriation and activities) and the built environment (attributes and affordances) were established as the key players in the processes of alienation. Finally alienation was defined as a sense of detachment to place caused due to changes in people, processes and places and the environmental attributes that lead to detachment were defined and established.

In the second stage, a case study of a double-shift school in Navi Mumbai, India was conducted to document goals, activities of the two shifts in order to understand the differences and similarities in the user - environment interaction between the two shifts. Secondly the physical space staging each activity was critically analyzed to conclude if it supports or deters the activity and its goals. A summary of the findings suggested that lack of 1) control of space; 2) ownership of space and 3) adaptability of space were the main reasons for detachment towards the environment.

Finally, in the third part of the study, environmental attributes that lessened the effects of alienation were established as 1) adaptability; 2) control; 3) personalization; 4) ownership. Based on these attributes design guidelines were developed for one of the case study schools and they were graphically illustrated.
# Table of Contents

## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>viii</td>
</tr>
</tbody>
</table>

## ACKNOWLEDGEMENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>xi</td>
</tr>
</tbody>
</table>

## CHAPTER 1: INTRODUCTION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Thesis Overview</td>
</tr>
<tr>
<td>1.1.1</td>
<td>What is a double - shift school?</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Why has the shift - school system been implemented in Mumbai, India?</td>
</tr>
<tr>
<td>1.1.3</td>
<td>What are the advantages and advantages of the shift - system?</td>
</tr>
<tr>
<td>1.2</td>
<td>Attachment and Alienation in a double - shift school : Conceptual Framework</td>
</tr>
<tr>
<td>1.3</td>
<td>Research Questions</td>
</tr>
<tr>
<td>1.4</td>
<td>Definitions of Concepts</td>
</tr>
<tr>
<td>1.4.1</td>
<td>Alienation</td>
</tr>
<tr>
<td>1.4.2</td>
<td>Attachment to place</td>
</tr>
<tr>
<td>1.4.3</td>
<td>Appropriation</td>
</tr>
<tr>
<td>1.4.4</td>
<td>Personalization</td>
</tr>
<tr>
<td>1.5</td>
<td>Significance of Investigation</td>
</tr>
<tr>
<td>1.6</td>
<td>Limits of Investigation</td>
</tr>
<tr>
<td>1.7</td>
<td>Research Methodology</td>
</tr>
<tr>
<td>1.7.1</td>
<td>Methodology Overview</td>
</tr>
</tbody>
</table>
CHAPTER 4: DESIGN STRATEGIES TO FOSTER PLACE ATTACHMENT .............................................. 58

4.1 Environmental attributes of Attaching places ......................................................... 60
  4.1.1 Accessibility .................................................................................................. 60
  4.1.2 Adaptability ................................................................................................. 61
  4.1.3 Legibility ...................................................................................................... 61
  4.1.4 Control .......................................................................................................... 62

4.2 Framework for Design Strategies ........................................................................... 63

4.3 Design Strategies ................................................................................................. 64
  4.3.1 Formal learning areas .................................................................................. 64
    4.2.1.1 Corridor as spillover space ............................................................. 66
    4.2.1.2 Flexible classroom layout ............................................................... 67
    4.2.1.3 Designated display zones ............................................................. 68
  4.3.2 Areas for Social contact ............................................................................. 69
    4.2.2.1 Spatial diversity ................................................................................ 70
    4.2.2.2 Texture and Color ............................................................................ 72
  4.3.1 Community gathering areas .................................................................... 74
    4.2.1.1 Accessible community areas ........................................................ 75
    4.2.1.2 Spatial diversity ................................................................................ 77
    4.2.1.3 Interconnected community areas .............................................. 78

4.4 Summary ............................................................................................................. 79

CHAPTER 5: CONCLUSION ............................................................................................ 80

5.1 Summary ............................................................................................................. 81

5.2 Policy and Recommendations ....................................................................... 82

5.3 Limitations ......................................................................................................... 84

5.4 Further investigation ......................................................................................... 85

BIBLIOGRAPHY .............................................................................................................. 88
LIST OF FIGURES

Figure 1: Use of graffiti to declare presence and express a point of view ............7
Figure 2: Art work displays by primary school children are markers of their occupancy and presence .................................................................8
Figure 3: Young children claim street space for their play activities ...................8
Figure 4: An overview of the methodology ..........................................................15
Figure 5: Artwork displays at classroom entrance: Children’s expressions of belonging .........................................................................................21
Figure 6: Second – grade student poster display — a territorial marker indicating occupancy ......................................................................................21
Figure 7: Artwork at the school entrance provides a glimpse of school life, current activities, and cherished values to an outsider .........................22
Figure 8: Diagram showing formation of Place attachment ................................22
Figure 9: Variables that affect attachment to place .............................................29
Figure 10: Typical floor plan showing school program layout around quadrangles ..................................................................................................35
Figure 11: Section through school building showing vertical stacking of program ..................................................................................................35
Figure 12: Secondary School – Tabulation of student activities .......................36
Figure 13: Plan and view of typical classroom layout .................................................. 37
Figure 14: The signage poorly expresses that the classroom is shared between 
10th grade C division and 4th grade D division .................................................. 39
Figure 15: 10th grade classroom or 4th grade classroom? ....................................... 39
Figure 16: Plan showing corridor during the recess as a place for meeting and 
socializing with peers ..................................................................................... 42
Figure 17: Corridor as meeting space .......................................................................... 43
Figure 18: Secondary school children crowd around staircase during the 
break between classes ...................................................................................... 43
Figure 19: Quadrangle as a place for celebrations ................................................... 46
Figure 20: Quadrangle as an exhibition space ........................................................... 46
Figure 21: Primary School – Tabulation of student activities .................................... 47
Figure 22: Plan showing use of corridor as a spillover space for the classroom 
exercises ........................................................................................................... 48
Figure 23: Primary School children in their ‘home base’ ........................................... 49
Figure 24: Use of staircase as spillover space during an art class ............................ 49
Figure 25: Inaccessible display boards ....................................................................... 50
Figure 26: Plan showing corridor during the recess as a place for playing and 
vigorous physical activity .................................................................................. 52
Figure 27: Central corridor area dominated by boys ................................................ 52
Figure 28: Use of staircase as a play area ................................................................. 53
Figure 29: Use of quadrangle as a playground ......................................................... 55
Figure 30: Quadrangle as an extension of the classroom .......................................... 56
Figure 31: Open to sky quadrangle affords visual connectivity between floors .... 56
Figure 32: Tabulation of place goals and corresponding environmental 
attributes .......................................................................................................... 62
Figure 33a & b: Examples of openable wall panels to afford flow of activities 
from classroom to corridor .............................................................................. 66
Figure 34: Image showing interior view of classroom ............................................... 66
Figure 35a: Furniture assembly supporting group work ......................................... 67
Figure 35b: Furniture assembly creating various activity zones ........................... 67
Figure 35c: Furniture assembly supporting lectures .................................................... 67
Figure 36: Different wall surface textures to delineate primary and secondary school territories ............................................................................................. 68
Figure 37: Plan indicating the locations of nodes and alcoves.................................... 70
Figure 38a: Primary school: Use of node for play activities ........................................70
Figure 38b: Secondary school: Use of node for hanging out ........................................70
Figure 39a & b: Secondary school: Possible use of alcoves ...................................... 71
Figure 39c: Primary school: Possible uses of alcoves ............................................... 71
Figure 40a: Use of signage and graphics to improve the legibility and give the corridor a unique identity ............................................................................... 72
Figure 40b: Use of color to improve legibility of corridor ........................................... 73
Figure 40c: Graffiti art as a means to improve legibility ............................................. 73
Figure 41a & b: Visual and physical access renders the atrium space an activity hub . ................................................................................................................ 75
Figure 42a: Plan of Fr. Agnel school indicating ease of access into the quadrangle ......................................................................................................................... 76
Figure 42b: Visual and physical access into the quadrangle ....................................... 76
Figure 43: Plan showing varied sizes of community spaces ...................................... 77
Figure 44a: Use of corridor to connect two quadrangle spaces ............................... 78
Figure 44b: Open staircases in the atrium visually connect community spaces on upper levels to the lower levels ................................................................. 78
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1.1  THESIS OVERVIEW:

A reality in developing countries such as India, double-shift schools were borne of the necessity to increase the number of school places and thereby fulfill the basic educational needs of more children. Double-shift schooling has helped many developing countries move towards universal primary and secondary education. It has also proved to be beneficial economically. Yet some critics see it as generating several problems such as a crunched school day, conflicts over ownership of space and a lack of a sense of belonging and connectedness to the school – all of which affect the learning experience of a child and contribute to a lower quality of education (Bray, 2008).

From a very young age children develop feelings about their everyday environments which induce powerful positive or negative images that linger as memories into adulthood. Children interact with their surrounding environment and in doing so they not only learn about their environment but also about themselves (Chatterjee, 2005). The
school environment is particularly influential as the average young person in India spends about 11,000 hours in schools (Grade 1 to Grade 10); an average of six to seven hours a day. It is important to note that this time is not exclusively devoted to taking lessons. Instead, a large number of these hours are devoted to the activity of actually living in schools and learning from other people’s experiences. Naturally, the school’s physical environment influences the child’s behavior and activities.

Though sociologists and educators have examined the shift system to determine how effectively it works in practice, impact on student performance and overall quality of education, many aspects have yet to be explored fully. These include the short school day which leads to less time being spent in the school and consequently a compromised sense of belonging and their effects on educational quality. What role does the school’s built environment play in facilitating a child’s sense of belongingness in regard to the school? As an architect, this question intrigues me and drives this study.

This thesis examines the built environment’s role in supporting the development of attachment and feelings of alienation that children experience regarding their school’s built environment. The study examines existing literature on place attachment theory in order to develop a conceptual model of the factors that affect development of attachment to a place. Based on this model, place characteristics that support formation of place attachments are developed. These place characteristics are employed as a framework for analyzing a double-shift school (case study) in order to determine the ‘attaching’ and ‘alienating’ spaces. Place characteristics are also used as a basis to identify environmental attributes that support formation of place attachments. The study concludes by suggesting design strategies that offer opportunities to reconnect the children with the school environments they inhabit. By investigating the contribution of the spatial setting in the detachment process, we are not only looking to
improve the child’s school experience and educational achievement, but to play a part in supporting the development of rich and positive memories of the school.

1.1.1 WHAT IS A DOUBLE-SHIFT SCHOOL?

Countries facing acute shortages of land, financial resources, and intellectual capital have adopted the system of shift-schooling, wherein the school operates throughout the day to accommodate the primary and secondary schools in multiple shifts within the same building facility. One version of shift-schooling, the ‘end-on’ system, which can be a double or a triple shift and has the first group of pupils arriving early in the morning and leaving at mid-day to make way for the second group that arrives at mid-day and leaves in the late afternoon (Bray, 2008). In certain models of operation, the two groups of pupils may belong to the same age group and by consequence the same grades, whereas in other models, the groups may belong to different age groups. The latter is more predominant among double-shift schools in Mumbai, India. In a majority of the shift-schools in Mumbai, the secondary school session (grades 5th – 10th) is conducted during the first shift in the morning followed by the primary school session (grades 1st – 4th) during the second shift in the afternoon. In this manner two distinct age groups; primary school children aged 6 – 10 years and secondary school children aged 11 – 16 years occupy the same space during different times of the day. The thesis is focused on investigating this type of shift-model.

1.1.2 WHY HAS THE SHIFT-SCHOOL SYSTEM BEEN IMPLEMENTED IN MUMBAI, INDIA?

As per the latest census (2001), Mumbai’s population is 11.9 million, which is about 2 million more than the previous census of 1991 (Pendharkar, 2003). This means that, each square mile of land in Mumbai supports over 50,000 people, which translates into about 550 sq ft of land per person, thus making the density of population in Mumbai over 62
times the average for India. From a phenomenal 44% decadal growth during 1961-71, Mumbai's population growth has progressively decelerated to 20% in each of the following two decades (1981-91) and (1991-2001) (Pendharkar, 2003). Thus, the growth rate of Mumbai's population now seems to have stabilized, and could decelerate further in future, thanks primarily to the saturation factor. However, even with the present slowdown in population growth policy makers cannot be complacency about the pressure on the city's infrastructure; given the MMRDA (Mumbai Metropolitan Region Development Authority) projections that place the population of the city at over 14 million by the year 2011 (Pendharkar, 2003). The civic authorities are under constant pressure to improve, expand and increase accessibility to basic civic amenities and urban infrastructure such as schools.

Out of the total population of 11.9 million as recorded in the 2001 census, about 3.7 million was attributed towards school going children (5 years - 16 years) (Juneja, 2001). About 30% of this population was not enrolled in the formal school system in Mumbai during 1998-2000 (Juneja, 2001). These figures are no doubt shocking, but they can be mainly due to long commutes and travel distances of home from a school, and the cost of time and energy to escort children to and from school, and school related factors such as over-crowding and unattractiveness of school buildings. Introduction of the shift-school system policy, owes its origin to the lack of available resources against the need to enroll more children into schools and increase accessibility of primary and secondary education.

The shift-school policy has helped the Maharashtra Board of Secondary Education to achieve goals of social equity and specifically of moving closer to achieving universal primary and secondary education. The system has also helped to alleviate pressure on educational facilities. Double-shift schooling also reduces school
operating costs and as a consequence allows schools to reduce their fees; the system also enables underprivileged pupils to work for more hours during the day, and thus both earn money to support themselves and their families and also attend school (Juneja, 2001). The ‘end-on’ mode of operation is the shift system that currently predominates in Mumbai.

1.1.3 WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF THE SHIFT-SYSTEM?

The main purpose of double-shift schools is to increase the supply of school places while avoiding serious strain on the government’s budget. The introduction of double shifts allows a single set of buildings and facilities to serve more pupils. This may be especially important in developing countries as well as urban areas where land is scarce and buildings are expensive. Double-shift schooling has been adopted as a policy by many countries such as Brazil, China, and Mexico to name a few, to move towards universal primary and secondary education. It may also serve several subsidiary functions, for example double-shift schooling:

- Encourages a fuller and broader use of existing resources.
- Contributes to the vibrancy of schools’ neighborhoods as they are active because of the extended school day.
- Broadens access to education, thus helping governments achieve goals of social equity.
- Enables authorities to make better use of scarce human resources.
- Reduces school operating costs, and therefore, reduces school costs.

The system though must negotiate several problems related to school organization and time-tabling, staff management, social factors, co-curricular activities and quality of the buildings (Bray, 2008). For example, Bray asserts that the sudden emptying and refilling of the school reduces the “children’s and teachers”- “sense of belonging” to the
school. It makes the school seem like a “teaching machine” or “factory” (Bray, 2008). As an architect, my interest lies in the child-school environment relationship and what the environment does or does not do to enhance a child’s sense of belonging.

1.2 ATTACHMENT AND ALIENATION IN A DOUBLE-SHIFT SCHOOL: CONCEPTUAL FRAMEWORK

In this thesis I am investigating the relationship between the spatial setting and the feeling of detachment and attachment towards occupied space experienced by school children. To understand this relationship, my initial focus was understanding how children developed a sense attachment to place. Based on this understanding, I developed a conceptual model for formation of place attachment that identifies and shows the relationships between various factors that affect a child’s sense of belonging to a place.

My initial research into understanding children’s relationship with their physical environment revealed that what children seek from place experience changes progressively based on age and consequently age-related physical and psychological needs. Likewise, children’s demands from a place and the manner in which they interact with the physical environment also change progressively with age. This strongly implies that “age of a child” should be considered while examining children’s feelings of attachment to and detachment from the physical environment. Consequently, the study is focused on children of two age groups; one being the primary school group of 5 – 10 years and the second being the secondary school group of 11 – 17 years.

At every age, children have a need to call some space their own, to have some space where they create their own worlds (Chawla, 1992). There is a need for some space where children can exercise their independence; where preschoolers can manipulate their environment and where adolescents can test new social relationships
and ideas (Chawla, 1992). This need intensifies in adolescence as children are searching within themselves and engage with their social settings to understand relationships and express their individual personalities.

The act of appropriating space is a process through which a person tries to establish “his space” in the place he/she inhabits. Proshansky (1983) supposes that a person appropriates space to satisfy his/her needs, to define his/her space, set it apart, and give the space his/her unique identity. Korpela (1989) argues that appropriation of space is a process that a person may also direct at the physical setting itself rather than at other people; in this conceptualization, the person attempts to conquer the space, adapt it to his/her needs, and give it particular characteristics in a process that is ultimately about fostering a positive self-identity. In this sense, space appropriation is more self-oriented than socially oriented. Appropriation involves projecting oneself on to a physical space and setting it aside for specific purposes. More often than not, this is achieved by way of visual displays, decorations or merely by occupying and using the space at specific times and behaving in a certain manner. Frequently, these objects (graffiti, posters, door decorations, street corner occupation as shown in Figures 1, 2, and 3 used as indications of the personality (real or desired) of the occupants serve as signs of their occupancy and presence.

Figure.1: Use of graffiti to declare presence and express a point of view. (Source: http://kamaldollah.com/singapore/Schools-graffiti.jpg)
Personalization is vital in that the user feels like he/she exerts control (real and perceived) over and feels a strong sense of identification with the space. The physical setting and its artifacts both reflect and shape children’s perceptions of themselves as individuals and as members of groups. Self and communal identities are thus inextricably linked to place and settings, particularly those spaces where we make our “mark,” where an expression of our unique identity (self or communal) is made manifest in the material world (Marcus, 1992). Over time, affective feelings of attachment towards these places
are developed, the place becoming a vehicle through which attachment processes are manifested.

The place can be a milieu or a medium that acts as a repository for a variety of experiences and also plays an important role in fostering self-esteem, self-definition, self-pride, and self-worth on both an individual and group level (Low, Altman, 1992). Louise Chawla (1992, p.75) suggested that “children are attached to a place when they express happiness at being in it, and regret at leaving it, and when they value it not for the satisfaction of physical needs but also for its intrinsic qualities.” She calls these intrinsic properties “affordances” or action possibilities offered by a place. Thus, everyday activities, routines, personalizations that are vital to forming an attachment are affected by environmental affordances and the ability of a child to perceive and shape them. According to Lynch (1977, 1981), emotional and physical claims to a place depend on basic spatial rights of presence, use and action, appropriation, modification and disposition. These rights ensure emotional and physical freedom and allow processes of manipulation, modification and control that are critical to the development of human connectedness and a sense of attachment to the spatial setting. In conjunction with this understanding of factors that influence attachment to place, a diagram showing development of attachment was developed (See Figure 8.). The diagram, along with dimensions of place that affect attachment and alienation, is explained in more detail in chapter 2.

Conflicts arise when the spatial setting fails to sustain the changing attitudes, needs, behaviors, and identities of all its occupants over time. Changes in place attachment occur when people, places, and activities or processes involved in the attachment change over time (Brown and Perkins, 1992). If the environmental setting fails to adapt to and offer support for the occupants’ desired activities and goals, thus failing
to sustain their communal identities and self-identities, the sense of continuity and attachment can erode (Brown and Perkins, 1992). In the context of this research, alienation is understood as a feeling of detachment regarding the place one inhabits when the environment and objects that define the place fail to sustain changes in use, appropriation and space personalization as the age group of children changes from the secondary school in the morning to the primary school in the afternoon. Each group of children makes different demands from the space and failure of the space to sustain these demands puts a constraint on children’s actions and uses, limits their ability to modify space to reflect personal and communal identities, and their ability to express territorial claims. This hinders development of feelings of ownership and belonging towards school space.

1.3 RESEARCH QUESTIONS

The research questions focus on the relationship of the spatial setting, its features and the formation of attachment and feelings of alienation experienced by a child toward the setting:

- What characteristics of a place affect the formation of attachments?
- What environmental dimensions aid the process of alienation?
- How can this knowledge be used to design school spaces so as to create and nurture a sense of belongingness and attachment.

1.4 DEFINITIONS OF CONCEPTS

The definitions of the following terms are far-reaching and can be interpreted in several ways. A precise narrowing of their definitions is necessary to carefully answer the questions explored in this thesis.
1.4.1 ALIENATION

Feelings of detachment regarding and a loss of a sense of belonging to a place inhere in the idea of alienation (Brown & Perkins, 1992). In a double-shift school, pupils experience alienation because of the inability of the spatial setting to sustain and adapt to change. Changes come in the form of the children of different age groups occupying the space — their different ways of appropriating, claiming, and personalizing space all make different demands on the space.

1.4.2 ATTACHMENT TO PLACE

The study defines the concept of attachment in relation to the physical environment. Attachment to place is defined as a positive, affective and cognitive connection between an individual/group and a particular setting or milieu (Brown & Perkins, 1992). Bonds develop when the place affords its inhabitants opportunities to express themselves and conveys this expression back to the inhabitants and other people, so as to facilitate formation of self and communal identity and in the process feelings of belongingness to the physical environment (Korpela, 1989; Altman & Low, 1992). Place attachment thus partakes in the formation and development of a child, and it also fosters group and cultural identities. For example in adolescence, bedroom posters, a wild décor or deliberate disarray are expressions of a child’s emerging self identity; the child also feels attached to the bedroom (place) as it affords opportunities for self expression and enables him/her to call the space as his/her own.

1.4.3 APPROPRIATION

Appropriation allows users to claim ownership, either symbolic or real, of a site (Lynch, 1981). Korpela (1989, 1992) defines appropriation of space as a process directed by an individual to his/her physical setting as an attempt to claim it, adapt it to his/her needs, and give it particular characteristics (personalization). According to Altman,
appropriation strategies often include identifiable territorial markers by organizing the parts of a setting. For example, objects such as posters and artwork by children in schools, planters and flower pots in residences are some examples of territorial markers used to create and convey identifiable territories. These markers are a reflection of the user (individual or group) and his/her identity (personal or community).

1.4.4 PERSONALIZATION

The act of modifying space and in the process giving it particular characteristics that are a reflection of the needs, aspirations, and condition of the inhabitants is referred to as personalization of space. Personalization is a child’s ability to externalize expressions and share with their peers important aspects of his/her life (Killeen, Evans, & Danko, 2003). The act of personalizing a space not only generates a stronger sense of self-identity in the individual child but also mirrors the values and culture of the school community (Altman, 1975). For example in schools, personalization is typically manifested through the artwork displayed in classrooms, corridors and other public spaces such as entrance lobbies.

1.5 SIGNIFICANCE OF RESEARCH

Extensive research has been carried out on double-shift schools in the fields of education and sociology. The International Institute for Educational Planning in collaboration with UNESCO and the World Bank through its Secondary Education Series published a series of papers that investigated the evolution, advantages and disadvantages, as well as operative and management problems, associated with “multiple-shift” operations (Bray, 2008; Linden, 2001). However, these papers elaborated the problems from a purely educational perspective by highlighting issues such as effect of the shift system on student performance and quality of education. While Bray (2008) makes a brief mention of alienation as a negative impact of shift-schools, the issue of feelings of alienation regarding the school’s spatial setting has not been addressed in
any of these publications. A study conducted in 1998 recorded that half the schools (both private and public) in Mumbai operated in multiple shifts (Juneja, 2001). Moreover, a 2008 World Bank report on secondary education in India advocated that a shift-school system be adopted wherever appropriate to improve access to primary and secondary education, thereby paving the way for a future increase in the number of double-shift school operations. It is certainly quite likely that there may come a time when the buildings are designed with the idea that they will accommodate both a primary and a secondary school. Why not investigate issues such as loss of attachment to place inhering in shift-schools as they are currently operating?

Hidalgo and Hernandez (2001) pointed out that one of the limitations of the existing literature on place attachment is its restriction to the spatial range of the neighborhood. They also noted that most studies have viewed places as social environments only with very few references to the physical dimensions of place in the definition of the concept of attachment. This study seeks to extend the range of existing knowledge on attachments to the neighborhood by studying place attachment in double-shift school environments and to present a more comprehensive view of place attachment by analyzing the formation of place attachments and feelings of alienation in regard to school settings and by proposing place characteristics that support the formation of attachments.

1.6 LIMITS OF RESEARCH

The emergence of double-shift schools in India is a consequence of the shortage of land and monetary resources. However, these aspects are not factored into the research since the focus of this study is not on financial aspects as they impact and define environmental features. Nor does this study explore the stress and psychological aftermath of loss of attachment to place. Instead, this study focuses on exploring ways to
improve the responsiveness of the school environment in terms of the internal environment of the school building itself. The chief concern of this research is the role of the environment in the formation of place attachment or lack of it and the dimensions of place that influence it.

1.7 METHODOLOGY

This study focuses on the relationship of the school environment and its architectural elements to the feelings of alienation or attachment experienced by children and teenagers in a double-shift school. The research offers insight into the use of spaces and what they mean to children. This type of subject lends itself to theoretical, rather than technical, investigation. Therefore, the design of the research process is primarily qualitative.

1.7.1 METHODOLOGY OVERVIEW

The research is carried out in three stages; archival research, case study and design guidelines. Archival research is the first stage, and is carried out with a view to develop a conceptual model of place attachment and alienation, and identify place characteristics that support formation of attachment to and alienation from a place. This knowledge feeds into the second stage of the case study in which place characteristics are employed as a framework for analysis of a double-shift school. The case study also helps identify environmental attributes of ‘attaching’ and ‘alienating’ places”. The final stage involves development of design strategies, so as to create flexible spaces that afford diverse uses, so as to encourage interaction and foster a sense of attachment towards school spaces. Figure 4 gives an overview of the research design and graphically expresses the connections between various stages.
1.7.2 **ARCHIVAL RESEARCH: OBJECTIVES**

- To develop a thorough understanding of the general patterns of use based on the curricula of primary and secondary schools in India with the purpose of identifying differences and overlaps between the two.
- To gain a deeper understanding of the way children situate themselves in and personalize their surroundings by interacting with the objects and features therein.
- To develop an intellectual scaffolding or conceptual model of place attachment and various factors that influence it, in order to identify instances of alienation and opportunities for attachment that are created by the built environment.
1.7.3 CASE STUDY: OBJECTIVES

- **Observation:** The purpose of this stage is to collect concrete evidence by observing and documenting examples in which certain architectural features/planning layouts that sustained or failed to sustain the different demands of the school children. This stage in the study consists of observing the entire school day (primary and secondary shift) in order to see how the double-shift systems play out within the building’s environment. The information obtained by observation will be analyzed using the conceptual framework developed through archival research in order to identify spaces and environmental attributes that aid processes of alienation and/or attachment. Data collected will be presented as images, detailed descriptions of the activities and, descriptions of how these spaces contribute to the development of alienation and/or attachment.

- **Interaction with teachers:** Informal interactions with teachers will help gain a practical understanding of the primary and secondary school activities, way of teaching and operating problems as well as help triangulate the data collected during observation. Since the case study will be carried out in the initial stages of the research, the main aim of the interactions is to get a teacher’s perspective of the shift-system, its advantages and problems.

1.7.4 RESEARCH OUTCOME

The research will culminate in a series of architectural strategies based on the place characteristics proposed by the conceptual model. These strategies can be seen as a stepping stone towards designing spaces in a double-shift school. The overarching concept for the strategies will be to create value in the environment so as to re-connect children to their immediate school surroundings.
1.8 APPLICATION OF INVESTIGATION: WHO CAN USE THESE INSIGHTS?

The research questions and objectives discussed earlier define the main intent of this thesis, and the insights of this investigation are beneficial for architects and designers in the field of education design. The insights are also useful for clients (such as school administration boards, and governmental agencies overseeing education policies) when planning, building or remodeling schools. The strategies are intended as a stepping stone to designing double-shift schools or factors to consider while designing spaces for a double-shift school.

It is very important to examine formation of attachment to place and feelings of alienation towards the school setting as it is a step in the direction of investigating the architecture of double-shift schools and consequently understanding its impact on children so as to design better and more responsive shift schools in developing countries.
The previous chapter introduced the double-shift school and briefly discussed its advantages and problems. It also established the goals, objectives, and methodology of this research study. The present chapter explores the existing literature on place attachment and children–environment interaction to define a framework for studying alienation from and attachment to the environment as manifested by children in regard to double-shift schools.

2.1 Place Attachment as a Place Relationship Construct

According to Chawla, “Children are attached to a place when they express happiness at being in it, and regret at leaving it, and when they value it not for the satisfaction of physical needs but also for its intrinsic qualities” (1992, p. 75). This statement is of profound importance to the definition and conceptualization of place attachment because it both hints at the source of attachment and posits it as an affective, emotional bond. Most importantly, it states that children place value on and find meaning in certain places that they inhabit. Overtime children experience positive emotions about
certain places that they inhabit (the opposite also occurs). Positive affective feelings stem from occupying a place and enjoying satisfactory interactions with and within it. From birth through middle childhood and adolescence, children have diverse physical, psychological, and developmental needs, and this is reflected in their interactions with inhabited place. As an example, middle childhood is accompanied by an intrinsic need to explore immediate surroundings and natural landscape in order to create secret places and dens. Teenagers seek out refuges for social use by claiming negative space (alleyways, street corners, abandoned buildings) in positively owned adult worlds (Childress, 2004). When a place successfully creates a fit between the action (use, activity) and the environmental features (attributes, affordances), a compatible relationship is created, and the child transacts with the environment (Chatterjee, 2005).

Chawla’s statement also points out that mere use is not a good indicator of attachment or value attached to a place. For example, the lunchtime use of an office tower plaza may be the result of a lack of meaningful alternatives. The space may be occupied, but not loved. A possible deeper attachment to place that is ignored by the central focus on use as a measure of satisfaction. However, the intrinsic properties of a place significantly affect attachment feelings and placement of values. Chawla (1992) referred to the potential affordances of the physical environment as intrinsic properties that are instrumental in helping children develop place attachment. These affordances or action possibilities afforded by a place offer opportunities to personalize and territorialize spaces through interacting with and manipulating the environment.

### 2.1.1 AFFORDANCES: MEANINGFUL FEATURES OF THE ENVIRONMENT

James Gibson coined the term affordance, and described it thus: “an affordance of any object is a specific combination of the properties of the substance and its surfaces taken with reference to an animal” (1986 p.83). Heft (2001) explained the
concept of affordances as a set of functionally significant properties considered in relation to an individual. For example, a horizontal surface that is positioned at a specific height from the ground relative to the leg length of a particular individual is perceived by that person to be climb-on-able that is it affords climbing (Heft, 2001). Affordance properties are simultaneously determined by the attributes of the environmental feature in question and the attributes of a particular individual; thus affordances are relational in nature. When there is compatibility between a child’s needs and the recognized affordances of a place, the child transacts with the environment to actualize the affordance and fulfill the need (Chatterjee, 2005).

2.2 PROCESS OF PLACE ATTACHMENT FORMATION

The way a child perceives and uses a place depends on a child’s perception of its affordances in relation to his/her physical and psychological needs. The shaping of the affordance and consequently its representation embedded in the environment tells us something about the child, his/her thoughts, aspirations, and values. The place thus becomes a repository of embedded identities, social and cultural processes of creation and transformation that reflect back onto the child allowing him/her to identify with them and feel inextricably connected to the place. These expressions of children’s identities also act as marks or signs of their presence and occupation, and represent their territories. Signs of occupancy are especially predominant at points of real and symbolic penetration, such as doors, windows, and approach ways (Brower, 1980). This point is illustrated by figures 5 and 6. Constructions, such as dens and forts, as well as inscriptions such as graffiti and posters, made children are physical markers of territory. Moreover, such signs marked are also used as means of regulating social interaction, making it possible to create different settings with varied levels of privacy (Altman, 1975).
Figure 5: Artwork displays at classroom entrance: Children’s expressions of belonging.
(Source: http://mspowell.com/otherclasses06/IMG_1209.JPG)

Figure 6: Second-grade student poster display — a territorial marker indicates occupancy.
(Source: Author’s Photograph)
Figure. 7: Artwork at the school entrance provides a glimpse of school life, current activities, and cherished values to an outsider. (Source: Author’s Photograph)

Figure. 8: Diagram showing formation of Place Attachment.
Diagrammatically, the process of forming an attachment to a place can be expressed as shown in figure 8. Through the diagram, we can see that place not only functions as a setting or stage for desired activity, but is also a product of that activity (such as, territories and spaces carved out by children within the place), thus leading to the creation of territories that are identifiable by children— their creators. These territories are defined by territorial marks or signs of occupancy, and they express the unique identities, values, and aspirations of the children. The nature of the territories, the way they are created and the reason for their creation, changes with the children’s ages, prevailing attitudes, and values. Another interesting observation, made by Sack (1986) and confirmed by Chatterjee (2006), suggests that often territories are temporary in nature, as they depend for their identities on the children’s presence in a space. In her pursuit of an empirical study on children’s outdoor activities in a New Delhi slum, Chatterjee (2006) observed, in one instance at least, that though the children enjoyed absolute control and hence power in place settings while they were active there, they had no control over these physical territories in their absence. The temporary nature of the territories became evident when the children left the settings, the use to which such settings were put also changed until such time as the children returned to reclaim them and recreate them as attachment settings. In chapter 3, my own observations of shift schools also confirm the temporary nature of territories made by children.

In conclusion, psychological needs (such as territory, security, private and restorative places, social interaction, and creative expression) and physical needs (vigorous physical activity, play involving creating objects) are inextricably linked to each other, and to the child’s age group and socio-cultural background. These along with environmental affordances collectively define and alter the nature of interactions and the process of forming an attachment to a place.
By personalizing a space, a child attempts to possess and control it. And, through everyday rituals and activities, a child comes by the experience of inhabiting a place. Certainly, children manipulate environmental affordances, and through this process, they create a verbal language of occupation (e.g., posters, graffiti, and constructions such as tree houses and dens) and a nonverbal language of the same (e.g., occupation of a street corner by teenagers, use of an old dilapidated building as a social meeting place, and rollerblading in back alleys). Lynch (1981) proposed that physical and emotional claims to a place depend on the spatial rights to that place. He further stated that these spatial rights allow or disallow the user to control the occupied space and that spatial control or the absence of it has strong psychological consequences, such as contributing to anxiety or attachment respectively. He proposed four forms of spatial rights as inhering in the achievement of spatial control. A brief review of these rights is useful to understanding how spatial control can be provided so as to create opportunities for meaningful interactions with place and for the development of feelings of attachment and caring in regard to that place.

Presence is the right of access to a place. Without access, use and action are not possible (Brower, 1980). The right to presence in a place depends on institutional rules and rules of social regulation set in place by the inhabitants of the place. Use and action involve the ability to use a space for desired purposes. Environmental affordances provide action possibilities and support certain uses while deterring others. Modification is the right to change a place in order to facilitate its use. Appropriation allows users to claim ownership, either symbolic or real, of a place. Childress (2004) distinguished between the adult notion of ownership fixed on acquiring or claiming a space. Young people’s concept of ownership seems to be use-based rather than fixed. Most generally stated, when someone is in a space, it’s theirs; when that person is not there, it’s up for
grabs. This broad rule is applied to their own use and to use and ownership by others (Childress, 2004). Thus, the claims of children and young people to a place are fluid in nature and depend on their presence in or absence from a given space. So, the question arises, what makes them come back and stake a claim to a space they had previously inhabited?

Marcus (1992) in Environmental Memories supposed that places that allow personalization and control form powerful images and resonate in the memory as remembered places. Chawla and Heft (2002) stated that “If environmental features had been responsive to a child’s actions, and if these features continue to offer rich possibilities for further engagement, the child will be inclined to use those features again.” In addition, Lynch’s (1981) set of spatial rights of control can be used as a stepping stone for understanding that children start valuing a place when it satisfies their complex needs. Integration of Lynch’s spatial rights with the process diagram of attachment reveals that children are attached to places that:

2.3.1 SUPPORT CHILDREN’S ACTIVITIES AND INTERESTS

The value of any place lies in the relationship between the person who uses it and the place itself. The extent to which children are active in a space is an important variable for children (Lynch, 1981). Environmental affordances present children with a set of action possibilities for engaging with the place. An affordance is a property of the environment that has perceived functional significance for an individual, a relation between some structural and/or functional attributes and the individual’s intentions (Heft, 2001), and children transact with the environment by actualizing affordances through activities (Kytta 2003). Pursuant to this point, it is through their affordances that places allow children to fulfill different needs and interests through action. Affordance
actualization in a place unites that place with a child through a process of meaningful exchange.

2.3.2 ALLOW PERSONALIZATION OF A PLACE

Personalization is the process of endowing an object or place with personal or group characteristics that are reflective of the identity, values, and beliefs of the person or group engaged in the process. By projecting the self onto the physical environment, a person not only invests the place with meaning, but also creates a unique expression of his/her identity in the material world (Korpela, 1989; Marcus, 1992). The creation of identifiable spaces via acts of personalization also adds a sense of intimacy, warmth, and security to the setting and is often seen as a visible evidence that people care about a place (Brower, 1980). For example, the act of decorating a classroom with artwork may help children to feel a part of the classroom environment. Opportunities for personalization allow individuals to feel engaged with their environment and consequently this fosters a feeling of ownership and belongingness.

2.3.3 SUPPORT CREATION OF TERRITORIES IN A PLACE

A place encourages the creation of territories when its environmental affordances support personalization of a space by children and protects those personalizations over a period of time.

Territoriality, the human behavioral urge to establish territories, can be defined as the relationship characterized by a feeling of possessiveness between a person/group and a particular physical setting, and by attempts to control the appearance and use of that space (Brower, 1980). The most common conception of human territoriality is control of space, and most scholars studying various aspects of human territoriality have included this aspect of control in their definitions. For instance, Sack (1986) defined territoriality as “the attempt by an individual or group to affect, influence, or control
people, phenomena, and relationships, by delimiting and asserting control over a geographic area.” According to Sack, “a place can be used as a territory at one time and not another; that is, in creating a territory we are also creating a kind of place.” (p. 19)

The definitions posited by Brower and Sack bring out two aspects of territoriality that have been empirically verified as especially important in the context of children’s territorial claims on an environment. Children are “legally prohibited from property ownership”; therefore, they only “appropriate and occupy the places of others” (Childress, 2004, p.195) enjoying unrestricted and unreserved use of space at one time and not another. Appropriation of a space is often accompanied by a display of identifiable territorial signs or markers, and objects in the setting are often used to communicate that it belongs to an individual or group. In addition, the act of appropriation is accompanied by a strong sense of personal identification towards the territory created (Brower, 1980). Since territories are created by an act of personalization, the occupant in the process gives the place particular characteristics that reflect his/her identity; thus, a meaningful place is created.

2.3.4 PROMOTE SENSE OF INDIVIDUAL AND GROUP OWNERSHIP

As children are “legally prohibited to own space,” they claim and occupy the places of others, resulting in the formation of territorial markers. Behavior, physical activity, and markers of occupancy are employed as the primary mode of claiming space (Childress, 2004) that lend a temporary quality to the territory thus claimed. The temporal nature of the claim leads to a fluid notion of ownership that is use-based and dependent on the presence or absence of the child in a place. Since children’s notion of ownership is not fixed, it is important to recognize their right to claimed territories in order to allow children to both directly influence their own use and experience of a
place and to develop a sense of responsibility, pride, and belonging to that place. From a behavioral point of view, opportunities for modifying and controlling an inhabited place foster involvement with that place. It should also be noted that participation in design and development has been found to increase a sense of attachment and ownership for many participants (Chawla & Heft, 2002). Likewise, when the degree of real or perceived control is limited, the sense of responsibility to a place may also be limited.

2.4 ALIENATION

The affordances of a place offer possibilities for activities within that place; by doing so, they also set limits on how that place can be used or acted upon. This means that the environmental affordances of a place can allow or deter certain uses. For example, a large and open space such as a school quadrangle affords the opportunity to play cricket—a favorite sport of Indian school children. The unpolished kadappa (a stone local to Mumbai) floor allows for a hard surface as a pitch for batting, and the openness of the quadrangle provides a large field-like setting for fielders to fetch the ball. Covered corridors all around the quadrangle create spaces from which to view the game. Through playing cricket in this space, the children experience a sense of having a territory. Similarly, environmental affordances can also deter certain uses, as is seen in the example of classrooms. The heavy furniture disallows children from moving it to create open spaces within the classroom for learning games, thus deterring small-group activity and collaboration among peers—a essential part of school and learning. The act of wanting to change the furniture layout can be characterized as an action performed not only to fulfill a particular use (in this case, small-group learning), but also as an act by which to control and personalize classroom space. These acts of personalization allow children to create territories, socially regulate the spaces they inhabit, and create
opportunities for involvement with their surroundings. At this point it is important to indicate that figure 9 shows the variables that affect the formation of place attachments. It should be noted that environmental affordances play an influential role in determining what a space is used for and how the space is used. Indirectly, affordances also affect the creation of territories that reflect communal goals, values, and beliefs. Simply put, a strong sense of personal identification is often a consequence of creating territories that reflect a sense of personal/communal worth. The diagram also illustrates that the psychological goals, interests, and physical needs of children are other factors influencing the use of space. Children’s intentions and goals are age-related and change as the child develops (Chawla, 1986). Consequently, their activities also change. Empirical studies of favorite-place analysis and childhood-place preferences (Lynch, 1977; Hart, 1979; Marcus, 1992; Korpela, Kytta, and Hartig, 2002) and the formation of territories and space appropriation by adolescents (Matthews, 2003; Childress, 2004) have shown that what children seek from place experience is based on age, life-circumstances, and social context.

![Figure 9: Variables that affect attachment to place.](image-url)
Chawla (1992) explained these progressive changes based on behavior mapping and favorite place analyses that she reviews in Childhood Place Attachments. On a physical level, the pre-school child will be happily attached to a place where he/she finds nurturance and security. Security is the primary place experience feature of this small but dependable place to which the child is attached. As the child grows into middle childhood and adolescence, his/her sphere of existence and occupation expands to include a succession of local places, with the home at the center. In middle childhood, when self-identity and social reputation are achieved via displays of physical strength and dexterity, an environment that provides opportunities for individual challenges and group play is tremendously valued (Chawla, 1992). Middle childhood (6 – 11 years) is characterized by cooperation with other children (usually same-sex groups) in active exploration of the neighborhood, playing games and making objects (such as forts, hideouts, and tree houses). These explorations are often constrained by family rules and schedules. Come adolescence, the search for self-identity is characterized by emotional and physical uprootedness (Chawla, 1992). In their quest to “find themselves” adolescents begin to avoid or challenge adult control by inhabiting places where they can regulate contact and communication with the adult world. They achieve this by inhabiting places of retreat and places of social interaction with peers (usually mixed-sex groups) away from prying adult eyes (Chawla, 1986). Examples of such places include the adolescent’s bedroom as a place of retreat. Negative spaces such as parking lots, street corners, and back alleys within a positively planned adult world are often preferred by teenagers as hangouts.

Conflicts may arise when same-age group communities are thrown together in a common place. Each community seeks to achieve different goals and objectives through place experience, and this translates into distinct ways of claiming territories for personal or community use. The place, then, must accommodate such communities by
offering a certain degree of flexibility in the affordances of its environmental features in order to sustain use and personalization by both communities. Detachment from or negative feelings towards the place arise out of restrictions on use and personalization; or put another way, they arise from an inability to control environmental experiences because of limited affordances for expressing identity. In the context of this research, alienation is defined as a feeling of detachment from the spatial environment (and its objects) that one inhabits. Such feelings develop when an individual or group is unable to:

- Use and freely appropriate inhabited space.
- Modify space to reflect personal/communal identity and values.
- Claim territories in occupied space.

2.5 SUMMARY

This chapter presented an analysis of the existing literature on childhood place attachment in order to create a process diagram and framework for further analysis of attachment and alienation in double-shift schools. It was noted that the relative flexibility of environmental affordances is the key to sustaining attachment feelings for communities with varying interests. The next chapter analyzes in depth the observations made and data collected during a case study of a double-shift school in Navi Mumbai, India. Place factors developed in chapter 2 are employed as a framework of analysis to examine the different spaces of the case study school in order to identify ‘attaching’ and ‘alienating’ spaces.
The place acts as a vehicle through which attachment processes are manifested. A vital part of the attachment process and hence processes of alienation are the activities and routines that are afforded by the environmental setting. These routines, activities, and personalizations are revealed as acts performed by the children to participate in, modify, and control the spatial environment they inhabit. The processes of manipulation, modification, and control are critical to the development of human connectedness and consequently the sense of attachment to the spatial setting. The case study discussed in this chapter provides an analysis of how “the school” and its built environment affect the formation of attachments to a space. The study also identifies the spaces that children feel attached to and those from which they feel distanced.

3.1 CASE STUDIES: INSTANCES OF ATTACHMENT AND ALIENATION

The main goal of the case study as mentioned in the research methodology in chapter 1 is to analyze a double-shift school in order to identify ‘attaching’ and ‘alienating’ places, and environmental attributes that support formation of attachment
to and alienation from the school built environment. The subsequent sections explain the context for the study and the framework of ‘place characteristics’ used to analyze the data collected during the course of the case study.

3.1.1 CONTEXT FOR THE STUDY

Double-shift schooling is most common in developing countries, India being one of many. The system has been adopted by countries such as China, Brazil and Mexico primarily due to increase accessibility of basic education, and countries such as Singapore in order to make efficient use of limited land resources (Bray, 2008, Vidaček, Koscec & Bakotic, 2007). The International Institute of Education Planning backed by UNESCO, conducted a study in 1998 that focused on the state of primary and secondary education in the city of Mumbai in India. The study established that half the schools (both private and public) in Mumbai and its suburbs operated in multiple shifts (Juneja, 2001). Moreover, a World Bank report on secondary education in India in 2008 suggested a strategy of adopting the shift-school system wherever appropriate to improve access to primary and secondary education. Not only do these findings determine that a large number of schools in Mumbai today operate in multiple shifts, they also point towards a possible increase in their numbers in the near future. While these figures certainly prompted me to focus on Mumbai, my primary reason for selecting a school there was my familiarity with its shift – school system, given that I studied at a shift school in Mumbai. In turn, I had already established connections with school organizations that had offered to facilitate my fieldwork. Fr. Agnel School and Junior College was the main case study and data collected at the school is discussed and analyzed in detail in this chapter.
3.1.2 FRAMEWORK FOR ANALYSIS

The case study consisted of observing the morning (secondary school) and afternoon sessions (primary school) of the school for one week. Both sessions were studied in the same manner. The characteristics of place that support the formation of attachments developed in chapter 2 were employed as a framework for analysis of the physical attributes and environmental affordances of each school area studied. The school areas were divided into 3 categories according to use:

- **Formal learning area**: Classrooms, laboratories, rooms for special purposes such as computer rooms, music rooms and sports rooms.
- **Areas for social contact**: corridors and staircases.
- **Community gathering**: Quadrangles, courtyards and assembly rooms.

Firstly, the types of use to which these spaces are put was recorded with a view to acquiring a general understanding of the patterns of use. Within the broad-based space categories noted above, the physical environment (affordances and attributes) of each area (for example, a classroom) were analyzed to determine how it provides opportunities for the development of attachment to and/or feelings of alienation from the place. The place characteristics (see chapter 2) used for analysis are as follows:

- Supports children’s activities and interests
- Allows personalization of place
- Supports creation of territories
- Promotes sense of individual and group ownership

3.2 CASE STUDY: FR. AGNEL SCHOOL

The Fr. Agnel School is located in the heart of a residential community in Navi Mumbai, which is a suburb of the city of Mumbai. It is a co-educational institution and works in two sessions: secondary school in the morning 7:00 a.m.–12:30 p.m. and primary
school in the afternoon 12:45 p.m.–5:45 p.m. The school building is a three-story structure that focuses inward on two large open-to-the sky courtyards or quadrangles—the place where the entire school comes together. All other spaces such as the classrooms, laboratories, library, special-use rooms, administrative and faculty offices are distributed around the courtyards on three floors. On each level, the spaces around the quadrangle are connected by a corridor that opens out and overlooks the quadrangle (See figures 10, 11).

Figure 10: Typical floor plan showing school program layout around quadrangles.
(Source: Author’s drawing)

Figure 11: Section through school building showing vertical stacking of program.
(Source: Author’s drawing)
### 3.2.1 THE SECONDARY SCHOOL

<table>
<thead>
<tr>
<th>SPACE</th>
<th>SPACE TYPE</th>
<th>TIME</th>
<th>ACTIVITY</th>
<th>TYPE OF ACTIVITY</th>
<th>PURPOSE OF ACTIVITY</th>
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<td>Learning: group discussion</td>
<td>Group</td>
<td>Development of social, communicative skills</td>
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<td></td>
<td>: lecture</td>
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<td>Corridors</td>
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<td>7:00a.m. - 7:30a.m.</td>
<td>Assembly &amp; communal prayer</td>
<td>Group</td>
<td>Cultivate &amp; nurture togetherness.</td>
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<td>Connectivity</td>
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</tr>
<tr>
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<td>Group &amp; individual</td>
<td>Social interaction</td>
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<tr>
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<td>Group &amp; individual</td>
<td>Connectivity</td>
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<td>(Social Contact</td>
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<td>Programmed</td>
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<td>Recess: talking, hanging out</td>
<td>Group &amp; individual</td>
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<td>(Social Contact</td>
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<td>Gathering Space)</td>
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<td>Assembly &amp; Communal Prayer</td>
<td>Group</td>
<td>Nurture togetherness &amp; oneness within the school</td>
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**Figure 12:** Secondary School: Tabulation of student activities.
3.2.1.1 Formal Learning Areas: Classrooms

The secondary school session begins at 7:00a.m. with the assembly and prayer and ends at 12:45p.m. A tabulation of student activities during this time is shown in figure 12.

- **Support children's activities and interests:** During the secondary school session, classrooms are occupied from 7:30a.m. to 10:00a.m. and subsequently from 10:45a.m. to 12:45p.m., after which the school adjourns for the day. Five divisions (A–E) make up a standard or grade (for example, 8th grade). Each classroom acts as a home base for a division, which means that the different subject teachers move from one classroom to another to teach their respective subjects. The classroom consists of a podium space from which the teacher conducts the class, and behind this space is a chalk board mounted on the wall. The children sit right across from the podium in four rows of benches and desks in lecture-style seating (See figure 13) with 2' wide aisles in between for circulation.

![Figure 13: Plan and view of typical classroom layout.](Source: Author's drawing & photograph)
The size of the benches is not sufficient to comfortably accommodate two children and their belongings; therefore, the aisles between the benches are often blocked because that is where the children place their bags. The desk tops are not wide enough to accommodate the books of both children, so that books are precariously balanced. Thus, the children’s ability to focus on their lessons is compromised. The difficulty is more apparent during art classes, when children have to do a juggling act with large-format books, paints, and color palettes. Classes for the secondary session are conducted more or less lecture style with the teacher making extensive use of the black board. Class participation in the lecture is encouraged, and student presentations are frequently organized. The teachers’ most favored teaching techniques include debates and slide presentations. Since all the walls are occupied by artwork and displays from the primary school, it is difficult to organize slide presentations in the classroom as all the walls are occupied with posters. The furniture layout of the classroom supports lecture-style teaching, and because the furniture is heavy, it cannot be moved to create different seating styles for facilitating group discussions. There is little to no place for displaying science projects (physical models, posters) for the secondary school children.

- **Allow personalization of place:** Even though the classroom is the home base for the children, they are unable to express themselves visually (posters, decorations, project displays) as all the walls are covered with art work and posters belonging to the primary school children. Due to this lack of display space, they express themselves by vandalizing, either drawing over or tearing, primary school artwork, on the walls. Carving and engraving on the walls as well as the wood of the desks is their way out of this limitation. There is no individual space (such as a locker) where each child could store personal belongings, extra school books, and other material necessary for school. Neither do the desks have provision for permanent storage.
Moreover, the desks and benches are attached to each other; this makes it even more difficult to move them around the classroom. In addition, they are not easy to stack. Unless we look at the signage outside the classroom (see figure 14), we would never know that this classroom “belongs” to 10th-graders (see figure 15).

Figure 14: The signage poorly expresses that the classroom is shared between 10th grade C division and 4th grade D division.
(Source: Author’s photograph)

Figure 15: 10th grade classroom or 4th grade classroom?
(Source: Author’s photograph)
- **Support creation of territories**: Each child or pair of children is allotted a desk and bench in the classroom (See figure 13). Unless the teacher notices repeated unacceptable behavior, a child is not asked to move to a different part of the class away from his/her friends. The relative permanence of the seat positions allows children to form social relationships with his/her neighbors over time. Neighbors interact with one another (by playing games, exchanging gossip, jokes) during class as well as between classes. Despite the furniture’s inflexibility, the seats are wide enough for most children (age group 13–17 years) to turn around and face neighbors sitting behind them. Sometimes, children sit on the desk tops using the seat as a leg rest to facilitate better interaction with neighbors sitting behind or in front of them. This gesture of turning around and sitting to face their friends creates an implicit territory, with the children themselves defining the boundary of it. It was also observed that children belonging to the same row of seats develop a sense of territoriality regarding their places and are reluctant to move to another part of the classroom when directed to do so. It is important to note that social relationships developed over time with their neighbors create a sense of social attachment to their place. Feelings of belongingness among inhabitants of a particular row of seats could also be a result of supervised and unsupervised activity such as debate and quiz competitions initiated by the teacher as part of the learning process and play activity organized by the children such as paper rocket fights, and games such as catch (played with a plastic/tennis ball). It should also be well noted that children sitting on the back row benches as well as those closer to the window show reluctance to the point of stubbornness when asked to move. While the attributes of the immediate surroundings may not influence the feeling of belongingness for children sitting in the same row of seats, the physical attributes of the place directly impact the experience of those closer to the window. Even though the windows have metal grills
that restrict clear view to the outside, they still provide a sense of visual relief. The back-row seats afford a sense of privacy, as they are not clearly visible from the podium. While this leads to difficulty in viewing and reading the chalk board, it is often a preferred location for those who want to be away from the teacher’s prying eyes. It is important to note, however, that these territories are temporary in nature and depend on the presence of the child in the place.

- **Promote sense of individual and group ownership:** Observations during the second session of the secondary school adolescents’ creation of temporal territories support Sack’s (1986) claim that places are used as a territory at one time and not another. However, it is noteworthy that in most observations, if not all, social relationships developed over a period of time with peers and neighbors playing a major role in the development of any feeling of attachment that the children have towards their seat location or seat column. The physical attributes of the furniture and the classroom layout constrain interaction among the students and between the teacher and the class, inasmuch as they do not support classroom activities and learning initiatives involving group discussions and debates. Shortage of opportunities to personalize a space by using visual signs and absence of a personal space leads that at least some children develop an uncaring attitude towards the place. Consequently, it is difficult to inculcate a sense of responsibility toward and pride in the classroom.

3.2.1.2 Areas for Social contact: Corridors & Staircases

- **Support children's activities and interests:** Corridors are the internal streets of the school, forming connections between spaces, directing movement of people, and most importantly providing a meeting place. The majority of the corridors have both a simple layout and an ample width of 8’, which affords easy
movement. However, the central corridor that connects the two wings of the building is 12' wide (see figure 16). This varying width helps the user situate himself/herself. Yet, apart from the above-mentioned signs of differentiation, the corridors have a visual sameness that reduces legibility and makes it difficult to find one’s way. The signage graphics are visually confusing. And, as they are not placed in a prominent location, they are not even easy to see.

The openness of the corridor space affords a variety of activities during break times. Students use the corridor as a place for hanging out with friends, talking, eating and sharing food, and playing physical games (see figure17, 18). It is also a place to see and be seen. As adolescents move away from the restrictions of childhood into the newfound independence of adulthood, social interaction in mixed groups and knowing what friends and foes are up to is extremely important for developing a sense of identity.
Figure 17: Corridor as a meeting place.
(Source: Author's drawing)

Figure 18: Secondary children crowd around the staircase during the break between classes.
(Source: Author's drawing)
Even though the corridor space is wide enough, activities mix due to overcrowding in certain areas that creates bottle necks in the flow of people, particularly in the areas around the staircases. The linearity and constant height-to-width ratio creates a one-scale space or a typologically equal place (such as, parking lots), which does not afford the creation of refuges or offer opportunities to create enclosures in which to have a private conversation amongst friends. However, openness to the quadrangle allows visual access to activities taking place on all floor levels. This creates a feeling of unity amongst the students.

- **Support creation of territories:** The corridors host a flurry of activity during recess times (10:00 a.m.–10:45 a.m.). Eager to take a break from classes, students, use the corridor space to exercise their independence from adult control in the classroom. Students use the corridor as a break-out space where they socially interact with their peers, play games, and generally hang out. These disparate activities are played out in different parts of the corridor and lead to the creation of distinct territories that are temporary in nature. The student population is concentrated along the longer corridors, and the space immediate to the toilets is sparsely populated. Space along the parapet wall is predominantly occupied by girls in clusters of 5–10, talking, eating and sharing food, and viewing activities going on in the other parts of the building. Corridor space along the walls of the classrooms is predominantly occupied by groups of boys. Spaces in between these groups are used for circulation; as such, they are frequented by boisterous boys playing games involving running, mock fights, and skirmishes. The corners of the corridors are occupied by large groups of boys usually trying to settle a dispute through a physical or a verbal fight and are avoided by girls. The fluidity of the territories is evident from the lack of a rigid physical boundary, the mixing activities, and people with conflicting interests
together in one space who create conflicts over space in the corridor. It is also important to note that these territories are temporary in nature and depend on the presence of the students in the space.

3.2.1.3 Community gathering areas: Quadrangles

- **Support children’s activities and interests:** The open quadrangle — the school square — is a place for community action, a place where the entire school comes together. The location of the quadrangle at the heart of the school and its openness to the floors above gives it a stage-like quality. The central location, visual access, and large unobstructed nature of the quadrangle make it apt for use as a stage for cultural performances, extracurricular activities, and daily student assemblies. As the space is open and column-free, it yields a great degree of flexibility in use. Sports training, badminton games (both quadrangles have a court laid out with removable poles for netting), and exhibitions are just a few examples of such activities. All the activities staged in the quadrangle represent the spirit of the school and are a reflection of values and beliefs cherished by the school community. While the quadrangle yields itself to myriad activities and functions, its openness to the elements renders it unusable during the four-month monsoon season.

- **Promote sense of individual and group ownership:** The unprogrammed quadrangle space offers students and teachers alike several possibilities of use. Easy accessibility, both physical and visual, creates a degree of transparency and encourages all to use the space. Celebrations, festivals, cultural and sporting events staged in the quadrangle involve the entire school and are instrumental in nurturing togetherness and a sense of community among all the school’s users (See figure 19, 20). Consequently, the children feel a sense of responsibility for and care towards this shared, democratic space. Decorations on the columns around the quadrangle,
gestures in regard to cleaning the space after using it are expressions of the children’s sense of responsibility for and ownership of the quadrangle.
### 3.2.2 THE PRIMARY SCHOOL

<table>
<thead>
<tr>
<th>SPACE</th>
<th>SPACE TYPE</th>
<th>TIME</th>
<th>ACTIVITY</th>
<th>TYPE OF ACTIVITY</th>
<th>PURPOSE OF ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classrooms</td>
<td>Programmed</td>
<td>12:45 p.m. - 3:15 p.m.</td>
<td>Learning by doing: painting</td>
<td>Group activity</td>
<td>Modification of space</td>
</tr>
<tr>
<td>(Formal Learning Space)</td>
<td></td>
<td>3:45 p.m. - 5:45 p.m.</td>
<td>: clay modeling, story telling, learning games</td>
<td>overseen by teacher/teachers</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Display of knowledge: charts</td>
<td></td>
<td>Personalization of space</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>: models</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>: drawings</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>: recitations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3:15 p.m. - 3:45 p.m.</td>
<td>Play during recess: running &amp; hiding</td>
<td>Group</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>: climbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Corridor</td>
<td>Unprogrammed</td>
<td>12:45 p.m. - 5:45 p.m.</td>
<td>Circulation</td>
<td>Group &amp; individual</td>
<td>Connectivity</td>
</tr>
<tr>
<td>(Indoor play space)</td>
<td></td>
<td>12:45 p.m. - 1:15 p.m.</td>
<td>Play during recess: running, jumping</td>
<td>Group &amp; individual</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3:15 p.m. - 3:45 p.m.</td>
<td>: soccer, cricket</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Play with fixed and movable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>elements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certain days</td>
<td>Viewing festivities in quadrangle</td>
<td>Group</td>
<td>Viewing gallery</td>
</tr>
<tr>
<td>Other Corridors</td>
<td>Unprogrammed</td>
<td>12:45 p.m. - 5:45 p.m.</td>
<td>Circulation</td>
<td>Group &amp; individual</td>
<td>Retreat</td>
</tr>
<tr>
<td>(Break out Space)</td>
<td></td>
<td>12:45 p.m. - 1:15 p.m.</td>
<td>Play during recess: running &amp; hiding</td>
<td>Group &amp; individual</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3:15 p.m. - 3:45 p.m.</td>
<td>: climbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12:45 p.m. - 5:45 p.m.</td>
<td>Eating &amp; sharing food</td>
<td>Group &amp; individual</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certain days</td>
<td>Viewing festivities in quadrangle</td>
<td>Group</td>
<td>Viewing gallery</td>
</tr>
<tr>
<td>Staircases</td>
<td>Programmed</td>
<td>12:45 p.m. - 5:45 p.m.</td>
<td>Circulation</td>
<td>Group &amp; individual</td>
<td>Connectivity</td>
</tr>
<tr>
<td>(Break out Space)</td>
<td></td>
<td>12:45 p.m. - 3:45 p.m.</td>
<td>Play during recess: climbing, jumping</td>
<td>Group &amp; individual</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3:45 p.m. - 5:45 p.m.</td>
<td>: sliding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadrangle</td>
<td>Unprogrammed</td>
<td>12:45 p.m. - 5:45 p.m.</td>
<td>Circulation</td>
<td>Group &amp; individual</td>
<td>Connectivity</td>
</tr>
<tr>
<td>(Stage, Congregation &amp; Gathering Space)</td>
<td></td>
<td>12:30 p.m. - 12:45 p.m.</td>
<td>Play during recess: running &amp; hiding</td>
<td>Group &amp; individual</td>
<td>Social interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3:15 p.m. - 3:45 p.m.</td>
<td>: ball games</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certain days</td>
<td>Staging events: cultural</td>
<td>Large group</td>
<td>Exercise freedom of expression, extra-curricular, sports</td>
</tr>
</tbody>
</table>

**Figure 21:** Primary School: Tabulation of student activities.
3.2.2.1 **Formal Learning areas: Classrooms**

The primary school session begins at 12:45 p.m. and continues until 5:45 p.m. A tabulation of significant student activities during this time is shown in figure 21.

- **Support children's activities and interests:** The children spend a majority of their school time in their **home base**—their classroom (see figure 22, 23). Learning happens by way of activities such as drawing, clay modeling, and learning games in small groups of 5–8 children all supervised by the teacher.

![Figure 22: Plan showing use of corridor as a spillover space for the classroom exercises.](Source: Author's drawing)

Many of these activities require open floor space. The rigidity of the existing furniture layout does not support the above-mentioned activities. The heavy and clunky furniture cannot be moved around or stacked easily by children; therefore, it restricts the range of learning activities that can be undertaken within the classroom.
As a result, the activities are divided between, the classroom and corridor adjacent to the classroom (see figure 22, 24). While this allows learning activities to take place, it creates difficulties for the teacher who has to supervise two places at a time. Also the class cannot take part in the activity as one entire unit. Since the goal of these activities is not only to learn something new but also to promote social interaction among children, using the corridor or staircase as a solution is not a complete answer to the problem. Even though the walls can be used as a bulletin board for displaying...
the children’s crafts and drawings, most displays are located at a height that is young children cannot reach without standing on a bench (see figure 25).

![Diagram of Classroom and Corridor]

**Figure 25: Inaccessible display boards.** (Source: Author’s drawing)

- **Allow personalization of place:** The rigidity of the furniture restricts the children’s use of the classroom space for learning games and other activities that need an open floor space. As the furniture is very heavy to move around, it does not afford flexible seating arrangements that would facilitate small-group learning and interaction. Further, the furniture in most of the classrooms is too big for the 1st- to 4th-graders. As a result, some children, unable to reach the desk once seated, stand throughout the length of the lecture. While children decorate their classrooms with great care, they are apprehensive about the safety of their artwork. Fear of vandalism leads to locating displays at a height of 4’ and above, making them inaccessible to the young children.

- **Support creation of territories:** As discussed in chapter 2, the formation of territories is often associated with signs that act as indications of occupancy. Decorating classroom doorways and walls with artwork, posters, and personal creations are children’s efforts to claim the classroom as their own space and territory. While the
walls afford the action of claiming space, the affordances of the furniture hinder creation of territories for different uses within the classroom space. The size of the benches and the height of the desks are uncomfortable for the young children and restrict their activities. However, it must be noted that the proximity of the benches to each other and the permanence of the seating arrangements for the children’s foster the development of social ties and friendships. Over a period of time, children tend to become socially attached to places based on social interaction.

- **Promote sense of individual and group ownership:** Even though the children do attempt to personalize the classroom spaces via decorations and artwork displays, the physical attributes of the classroom spaces together with their heavy furniture render them unable to support a variety of activities essential to learning, and inhibit the development of a sense of pride in and responsibility to such spaces.

### 3.2.2.2 Areas for Social contact: Corridors & Staircases

- **Support children’s activities and interests:** The corridors or internal school streets are essentially programmed for people to circulate through the school building. However, the corridor transcends its primary use as circulation space to offer immense possibilities for play, action, and interaction. During the recess time (3:15p.m.–3:45p.m.), the corridors become dynamic places where continuous and changing activities take place. The openness and unobstructed linear quality of the corridors encourages games involving physical activity. Figure 26 graphically illustrates the various uses and their locations in the corridors during the recess.
As an example, children use the length of the corridor to run mock races. The wider central corridor is used mostly by young boys for playing soccer and cricket (the most popular Indian sport) (see figure 27).
The flat, hard floor serves as a good field for soccer, with the four columns at the book ends of the corridor serving as the end of the pitch. A stray bench is often used as the goal post. The bench is not only integral to the game; it also helps define the territorial boundary of play and so deters others from entering the space. While most children participate in some form of physical activity, some entertain themselves by watching the others play. This quiet activity is often disrupted, though, by rowdy children getting involved in a rough game or even a fight. The linear nature of the corridor does not afford refuges or areas where young children can quietly spend time talking, eating, and watching others play. But the corridor does have a further use that of a viewing gallery for performances and programs staged in the quadrangle. It was observed, though, that, looking over the parapet wall is difficult for a majority of children, such that they cannot use the area view activities below. Many children must stand on tip toe if they wish to watch the programs. The steps afford a place for sitting, and children gather here in small groups to talk and eat and share food (see figure 28).
It was noticed that many students slide down the brick railing of the staircases, instead of using the steps to move between levels. The mundane activity of circulation is transformed into a game as each child tries to outdo the other on speed of descent. The staircases also afford a great place to hide from others, especially on the first floor underneath the leg of the staircase. It was observed that children often use this as a place in which to hide or as a refuge from the crowd.

- Support creation of territories: By way of space appropriation, the children create territories that serve a particular use. During recess, a majority of the children engage in some sort of physical activity, be it running, hiding, or climbing on loose, stray benches, etc. It was observed that the loose objects in the corridor, such as benches and desks, serve as territorial markers and signs of use. In some cases, like the central corridor’s use as a soccer pitch, loose objects are an integral component of a game and serve as a deterrent to others wanting to use that space. Though the corridor space offers a great deal of flexibility for many activities, the linearity of the corridor deters the creation of quiet places and places of refuge from the crowd.

- Promote sense of individual and group ownership: The flexibility and openness of the corridor afford a majority of young children several possibilities of play and action. For the most part, the children are able to control their experience of place and create opportunities for play and action by actualizing the affordances of the corridor. For a primary school child, the corridors represent a free place full of possibilities for play, action, and adventure that he/she can use without restraint. The children’s reluctance to leave the corridor space and their glad return after class is representative of their feelings of attachment to the corridor.
3.2.2.3 Community gathering areas: Quadrangles

- **Support children’s activities and interests**: As an unprogrammed space, the flexible and open quadrangle offers several possibilities for group and community activities. For the primary school children, it is their indoor **playground** (see figure 29).

![Figure 29: Quadrangle used as a playground. (Source: Author’s drawing)](3)

The open and unobstructed space affords playing of games involving large groups such as cricket (India’s most popular sport). Since the corridors enveloping the quadrangle are at a higher level than the quadrangle itself, the step thus created affords the children a seat from which to watch the game or chat with friends while eating. The openness of the quadrangle allows different activities to take place simultaneously. Cricket and other large-group games take place in the center of the quadrangle. The corridors are abuzz with groups of children watching, cheering their friends on, and other children engaged in rough games. The smaller quadrangle affords gathering areas for activities, such as puppet shows, magic shows, rehearsals for dances or supervised class games that involve the entire class or several classes. In
this way, it becomes an extension of the classroom (see figure 30). The triple height, central location, and openness to the corridors above allow visual access into the quadrangle and create visual connectivity between the three levels (see figure 31). This quality of the space engenders a sense of community amongst the students.

Figure 30: Quadrangle as an extension of the classroom. (Source: Author’s drawing)

Figure 31: Open to sky quadrangle affords visual connectivity between floors. (Source: Author’s photograph)
• **Support creation of territories:** The generous size, openness, flexibility, and visual transparency of the quadrangles allow several activities to take place simultaneously so as to accommodate the needs of several groups at a given time. Small groups are able to claim corridors for playing games, sitting, chatting, and watching others play. The larger quadrangle is monopolized by young boys playing cricket. The smaller-sized quadrangle usually sees several groups (mostly young boys) playing rough games. Groups of girls territorialize the corridors that envelope this quadrangle to chat in groups and share food.

• **Promote sense of individual and group ownership:** The quadrangle space offers students immense possibilities of use and action and accommodates the interests of teachers (as an outdoor group learning space, performance space) and students (for playing purposes). Easy accessibility encourages all to use the space, and the visual access to the floors engenders a feeling of togetherness. Celebrations, festivals, cultural and sporting events staged in the quadrangle involve the active of the entire school and are instrumental in nurturing a sense of community among all the school users. Consequently, the students develop a sense of belongingness in regard to this shared, democratic space.

### 3.3 SUMMARY

Both the primary and the secondary school children clearly value a place that affords several types of uses and accommodates the needs of diverse groups. The children also value the places that allow them to take control and alter their experience of the place. They do not care for spaces that restrict their activities. For valued places, their *unprogrammed nature, flexibility of use,* and *adaptability* to several different users and their demands are noticeable place properties. Places such as the quadrangle, corridors, and staircases are valued for their ability to transform and accommodate the
needs of diverse users. Children from both sessions feel inextricable ties to these spaces even though they do not spend most of their time there. Classrooms or home bases on the other hand are held in less regard because they restrict use. Children have little prospect of altering their classroom environment in order to support their activities. The classrooms lack flexibility, and their environmental affordances are unable to respond to the different needs of the morning and afternoon sessions. Consequently, children from both sessions feel distanced from their classroom place. The next chapter focuses on furthering the notion of flexibility and adaptability into a design strategy for creating spaces that children in a double-shift school will value.
A careful evaluation of the findings of the case study outlined in chapter 3 suggests that children from both sections of the double-shift school felt a sense of belonging towards certain areas, the quadrangle and corridors, for example. And, they also tended not to care about certain other areas, such as the classrooms. It was also noted that these spaces were primarily valued for their ability to support children’s interests and desires and because they afforded diverse groups of children the ability to control and modify their experience of place. In keeping with this observation, it was noted likewise that children felt distanced from places that restricted their activities including constraining their ability to modify place. These observations, which are all detailed in chapter 3, prompted me to ask associated questions, such as which place attributes support the development of place attachment? Which properties of place trigger feelings of detachment among the school children? It is the purpose of chapter 4 to endeavor to answer these questions. This chapter develops design strategies and
corresponding physical place attributes based on the place characteristics posited in chapter 2 (see sections 2.3.1–2.3.4, pp. 23–25) in order to create valuable school places for the children.

4.1 ENVIRONMENTAL ATTRIBUTES OF ATTACHED PLACES

Based on the findings of the case study, the following environmental attributes emerged as vital to the associated processes of developing attachment to the school (place) and of reducing alienation from it.

4.1.1 ACCESSIBILITY

Access is an important prerequisite to realizing many of the other dimensions of spaces used for social interaction. To ensure that a space is well used, it must be accessible (Lynch, 1981). Only by having access to a space can people participate in it, and only by participation, can people develop a sense of belonging to the space. For example, Vliet (1983) found that teenagers’ access to community spaces was important for them to feel attached to a community.

Accessibility in the scope of this thesis is defined as ease of movement through a space that thereby creates the possibilities of both active and passive use of that space. A child makes active use of a space inasmuch as cast he/she is a performer, engaging with the space in some form of physical activity. A child makes passive use of a space when he/she is an observer, whose principal engagement is that of watching the activities of others. Essentially, this translates into three types of access: physical, visual and social. Visual access is the ability to see into a space which generates awareness about the space. Physical access is the ability to physically enter a space. Social access is the availability of the space to different types of users (Francis, 1989). For example, the quadrangle (community gathering space) mentioned in the case study in Chapter 3 is socially accessible in that it allows children of different age groups to co-exist there.
4.1.2 ADAPTABILITY

Since space comes at a premium price in a double-shift school, it is essential to use a space for several different purposes. Moreover, the two distinct user groups, the primary school children and the secondary school children, make different demands on the space. The space must be adaptable, therefore, not only in that it must meet the variety of demands made by each group, but it must also meet the demands of two distinctly different groups. Adaptability is defined as the extent to which an environment and its features can be modified to accommodate new or different patterns of use and activities. This can be achieved through manipulability, the extent to which children can change the properties of the space and its elements in order to satisfy their learning or recreational needs. In turn this environmental quality actively engages children with the environment by offering opportunities to modify it. For example, sliding walls between classrooms allow for changing classroom sizes, either affording a larger space for large groups or for activities requiring more space or affording a smaller setting appropriate for small groups of children.

While accessibility ensures that diverse groups of children use a space (Lynch, 1981), adaptability allows children to modify a space to suit their needs. Hence, attributes of accessibility and adaptability support children’s activities and interests in a place.

4.1.3 LEGIBILITY

Legibility in the scope of this thesis is defined as the ease with which children are able to conceptualize spatial relationships and hierarchies to effectively locate themselves and find their way through the school building. The environmental attribute of legibility can also be used as a tool to architecturally delineate territories as belonging to
certain groups in shared spaces. For instance, wall surfaces can be given varying textures in order to indicate separate display areas for primary and secondary school children.

4.1.4 CONTROL

Lynch (1981) suggested that a key ingredient of meaning and attachment is the concept of control or people’s ability to directly influence their own use and experience of a place. Children’s ability to influence their own use and experience depends on the extent to which they have control of a given environment. Control in the scope of this thesis is defined as the extent to which a school space affords children opportunities to personalize the space by forming and convey territory such that a sense of belonging to and ownership of the space is created. The presence of signs, such as artwork, is often an indication of territorial formations, as the signs clearly delineate which space belongs to which group.

Figure 32 indicates how the attributes of accessibility, legibility, adaptability and control together help satisfy place goals.

<table>
<thead>
<tr>
<th>OVERARCHING PLACE GOALS</th>
<th>ACCESSIBILITY</th>
<th>ADAPTABILITY</th>
<th>LEGIBILITY</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support children’s activities &amp; interests</td>
<td>![ ]</td>
<td>![ ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow personalization of space</td>
<td></td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
</tr>
<tr>
<td>Allow formation of territories</td>
<td></td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
</tr>
<tr>
<td>Promote sense of individual and group ownership</td>
<td>![ ]</td>
<td>![ ]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 32: Tabulation of place goals and corresponding environmental attributes.*
4.2 FRAMEWORK FOR DESIGN STRATEGIES

The conceptual (see Figure 8) model developed in chapter 2 establishes the physical attributes of a place as important in determining the affordance properties of the place. Consequently, the affordance properties determine the degree of interaction with the environment and in turn affect the process of place attachment. The place characteristics that affect the processes of place attachment and alienation were also established. And, they were subsequently used as a framework for analyzing the affordance properties of double-shift school spaces and thus determining the ‘attaching’ spaces and the ‘alienating’ spaces in the case study. The findings reveal that certain environmental attributes — accessibility, legibility, adaptability and control — support the development of attachment processes, while constraints on use and modification of space lead to alienation.

In order to develop design strategies, the place characteristics supporting the formation of attachment developed in chapter 2 were used as a framework of design. The place characteristics can be briefly recapped as 1) support children’s activities and interests, 2) allow personalization of a place, 3) support creation of territories in a place, and 4) promote a sense of individual and group ownership. This frame will help structure and focus the design strategies and corresponding attributes that will create spaces conducive to the formation of place attachments and the reduction of feelings of alienation in regard to school spaces. A set of 8 design strategies will be developed for the three space classifications posited in chapter 3:

- Formal learning areas
- Areas for social contact
- Community gathering areas
4.3 DESIGN STRATEGIES:

Design strategies for the space classifications mentioned earlier are presented in the following manner: 1) a brief description of the types of spaces is given, 2) the activities to be supported by the spaces are indicated, 3) the specific place dimension to be realized through the strategy is indicated, 4) the design strategy to achieve a specific place dimension is stated, 5) the environmental attribute corresponding to the design strategy is indicated, and 6) the design strategy is graphically illustrated.

4.3.1 FORMAL LEARNING AREAS

Formal learning areas include classroom spaces. The classroom space has been described as the home base and learning center for the children belonging to both the primary and secondary school sections. As a result, the children spend most of their time at school in the classrooms. The activities observed for the secondary school include traditional lecture-style lessons, group project activities, presentations, and small-group discussions. Activities observed for the primary school section include small-group activities; learning by doing, which involves activities such as making clay models, artwork, and other crafts; and traditional lecture-style lessons. It was also observed that these activities often spill over into the corridor adjacent to the classroom. Lack of visual and physical connectivity between classroom and corridor restricts the flow of activities, makes supervision difficult and puts constraints on the activities. This has a direct impact on the teaching methods and in turn the learning experience of the child. Design strategy 4.3.1.1 (p. 66) serves to create continuity between classroom and corridor by configuring the corridor as an extension of the classroom.

The inflexibility of the classroom layout constrains the small-group learning initiatives of both the primary and secondary sections. Design strategy 4.3.1.2 (p. 67) suggests that a flexible furniture layout will allow for a variety of classroom layouts and so
support activities involving different group sizes. In this way, children and teachers will be able to modify and control the layout of the classroom based on the specific needs to the class and the learning objectives to be met.

In a double-shift school, it is important for children from both shifts to be aware of the shared status of their classroom in order to facilitate responsible use of the classroom infrastructure. Design strategy 4.3.1.3 (p. 68) aims to architecturally delineate space as belonging to a certain group of children.
## CORRIDOR AS SPILLOVER SPACE

<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>visual accessibility</td>
<td>Support children's activities &amp; interests</td>
<td>The corridor immediately next to the classroom should be configured as a spill-over space for the classroom by providing visual and physical accessibility from the classroom.</td>
</tr>
<tr>
<td>physical accessibility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 33 a & b**: Examples of openable wall panels to afford flow of activities from classroom to corridor.  
(Source: Author’s drawing)

**Figure 34**: Image showing interior view of classroom.  
(Source: Author’s drawing)

### 4.3.1.1 CORRIDOR AS SPILLOVER SPACE
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>adaptability</td>
<td>support children's activities &amp; interests. allow personalization of space.</td>
<td>The classroom layout should be easily adaptable to activities involving different group sizes. Consequently, the furniture should be selected or designed to afford easy manipulation, movement, and stacking.</td>
</tr>
<tr>
<td>control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure.35 a: Furniture assembly supporting group work.
Figure.35 b: Furniture assembly creating various activity zones.
Figure.35 c: Furniture assembly supporting lectures.

(Source: http://www.designshare.com/research/EEK/Figure5ESCR300.jpg)

4.3.1.2 FLEXIBLE CLASSROOM LAYOUT
### DESIGNATED DISPLAY ZONES

<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>adaptability</td>
<td>support children’s activities &amp; interests.</td>
<td>Wall surfaces should be varied texturally in order to delineate zones for artwork and project displays for the primary and secondary school sessions. The zones can be divided among the two sessions; each session should take responsibility for maintaining its display zone.</td>
</tr>
<tr>
<td>legibility</td>
<td>allow personalization of space.</td>
<td></td>
</tr>
<tr>
<td>control</td>
<td>promote sense of individual and group ownership.</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.6:** Different wall surface textures to delineate primary and secondary school territories. *(Source: Author’s drawing)*

---

**4.3.1.3 DESIGNATED DISPLAY ZONES**
4.3.2 AREAS FOR SOCIAL CONTACT

Areas for social contact include corridors and staircases. Corridors are the internal streets of the school connecting school spaces, directing the movement of children, and most importantly providing a meeting place. The corridor offers the children a much needed break-out space. The activities most often observed for the secondary school session are talking, eating and sharing food, observing the activities of other users in the corridor and on other floors, and playing rough physical games in the central corridor. The activities most often observed for the primary school session are playing with stray furniture and playing large-group ball games and rough physical games involving running and hiding. In both sessions, it was observed that the area where the corridor meets the staircase is a prominent node for the congregation of children from different floors of the school building.

Design strategy 4.3.2.1 (pp. 70 – 71) seeks to create a variety of spaces in the corridor with a view to supporting groups of different sizes with varying needs. Corridors can be widened where they meet the staircases, thus creating communal nodes where large groups can gather and play. The corridors could also be widened along their length at certain intervals to create alcoves that afford spaces for small groups to gather.

Design strategy 4.3.2.2 (pp. 72 – 73) focuses on improving the legibility of the corridor by giving varying textural surfaces to the walls. Varying textures can be achieved in several ways through the use of different kinds of paint, graphics, and student artwork. As a part of the strategy, primary and secondary school children can collaborate on artwork to decorate the corridor walls and give them a unique identity.
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>adaptability</td>
<td>support children’s activities &amp; interests.</td>
<td>In order to create spatial diversity, corridors can be widened where they meet staircases, thereby creating communal nodes. Corridors should also be widened along their length to create alcoves to afford small-group activities.</td>
</tr>
<tr>
<td>legibility</td>
<td>allow personalization of space.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>promote sense of individual and group ownership.</td>
<td></td>
</tr>
</tbody>
</table>

Figure.37: Plan indicating the locations of nodes and alcoves. (Source: Author’s drawing)

Figure.38a: Primary school: Use of node for play activities
Figure.38b: Secondary school: Use of node for hanging out. (Source: Author’s drawing)
The alcoves add diversity in terms of scale to the linear corridor space and create spaces that afford children places to hide, create dens, and gather in small groups, thus supporting the creation of private places. Communal nodes at the ends of the corridor and at the corridor and staircase junction offer possibilities for group gatherings and play activities. Figure 37 demonstrates how corridors can be widened to create spatial diversity.

4.3.2.1 SPATIAL DIVERSITY
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>legibility</td>
<td>allow personalization of space. promote sense of individual and group ownership.</td>
<td>The texture and color of wall surfaces along the corridor should be varied to improve legibility and create a unique identity for each classroom.</td>
</tr>
<tr>
<td>control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 40a: Use of signage and graphics to improve the legibility and give the corridor a unique identity.*
(Source: Sorell, J and Sorell, F, 2005) (Source: Author’s drawing)
Collaborations between primary and secondary school children on projects to decorate and paint the corridor walls not only improve the corridor’s legibility, but also more importantly offer children opportunities to express themselves and create a communication platform between the two school sessions.

Figure 40b: Use of color to improve legibility of corridor.
(Source: Author's drawing)

Figure 40c: Graffiti art as a means to improve legibility
4.3.3 COMMUNITY GATHERING AREAS:

Community gathering areas include spaces that facilitate large-scale congregation and assembly, such as interior courtyards and quadrangle spaces that are enclosed by buildings on all sides. Since space is at a premium in a double-shift school, designating separate spaces for assembly, cultural events, and play activities is not feasible. As a result, community gathering areas are often the nerve center of school activity, as they allow large groups and even the entire school to come together, and they serve multiple purposes. Such spaces bring diverse school communities together and help nurture a sense of togetherness. Activities observed in community spaces include various types of play activities, among them ball play, group play, play involving vigorous physical activity, and cultural activities, such as festivals. Such spaces also stage cultural and performing arts events, educational events, and daily student assemblies.

Design strategy 4.3.3.1 (p. 75 – 76) suggests interconnecting community gathering spaces and circulation spaces to encourage use of the space. Design strategy 4.3.3.2 (p.77) suggests creating community spaces of varied sizes to afford diverse activities. Design strategy 4.3.3.3 (p.78) focuses on the importance of connecting community spaces in order to ensure a flow of activities from one space to another.
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>visual accessibility</td>
<td>support children's activities &amp; interests.</td>
<td>Community gathering areas should be physically and visually accessible from circulation spaces, such as corridors, to encourage use of the space.</td>
</tr>
<tr>
<td>physical accessibility</td>
<td>promote sense of individual and group ownership.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 41 a & b: Visual and physical access renders the atrium space an activity hub.  
(Source: Dudek, p. 239, 2007)
Visual and physical accessibility from circulation spaces encourages active and passive use of community spaces, thus creating a lively space. Visual connections create transparency and bring the entire school community together.

4.3.3.1 ACCESSIBLE COMMUNITY AREAS
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>adaptability</td>
<td>support children’s activities &amp; interests.</td>
<td>Community gathering spaces should vary in size to in order to be adaptable to different group sizes, their activities and demands.</td>
</tr>
<tr>
<td>control</td>
<td>allow personalization of space.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 43: Plan showing varied sizes of community spaces. (Source: Author’s drawing)

4.3.3.2 SPATIAL DIVERSITY
<table>
<thead>
<tr>
<th>ENVIRONMENTAL ATTRIBUTES</th>
<th>PLACE CHARACTERISTICS</th>
<th>DESIGN STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>visual accessibility</td>
<td>support children’s activities &amp; interests.</td>
<td>Community gathering areas should be interconnected using circulation spaces to allow flow of activities from one space into another.</td>
</tr>
<tr>
<td>physical accessibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>legibility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interconnecting community gathering areas also provide opportunities for interacting with children from other classes, thus encouraging socializing.

4.3.3.2 INTERCONNECTED COMMUNITY AREAS

Figure 44a: Use of corridor to connect two quadrangle spaces. (Source: Author’s photograph)

Figure 44b: Open staircases in the atrium visually connect community spaces on upper levels to the lower levels. (Source: Dudek, p.247, 2007)
4.4 SUMMARY

The design strategies presented in this chapter focus on creating architecturally diverse and flexible school spaces that can be adapted to varying user needs and so reduce feelings of alienation for children in double-shift schools and help inculcate and support feelings of belonging. This is achieved by providing opportunities for children to actively engage with their immediate spaces and create a sense of belonging in regard to school spaces. However, it is important to note that the design strategies are suggestive and do not offer a clear-cut solution to resolving the problem of alienation that children experience in double-shift schools. The problem of alienation has various other dimensions that have roots in education policy planning at the government level and the school administration level. The last chapter briefly discusses these as directions for future research, as well as summarizing the contributions of the thesis.
An endeavor to define the double-shift schools as a legitimate school building sub-type, this thesis shed light on the related issues of lack of attachment to space and the conflicts of ownership that plague this kind of school system. The thesis has also contributed design strategies that focus on meeting the specific challenge of creating flexible school spaces that children are likely to enjoy and value. The thesis determined that it is important for architects to consider design parameters that go beyond the notion of mere use, such that they create spaces that allow for personalization, territorial claims, and a sense of control and ownership (real or perceived) — all of which connect with attachment formation processes. By incorporating parameters that directly affect and foster attachment and thereby reduce alienation from the environment, the design strategies present a more comprehensive view of what should be considered and what is possible in designing successful double-shift school environments.
5.1 SUMMARY

The objectives of this thesis were to investigate and answer three major questions concerning the role of the built environment in supporting the formation of attachments to and/or feelings of alienation from spaces in a double-shift school. The first objective was to understand how children develop feelings of attachment to certain spaces as well as to identify the qualities of spaces that promote attachment formation. An extensive study of the existing literature on place attachments led to the development of a process diagram of attachment that posited people (children), processes (action, use, and appropriation) and the built environment (attributes and affordances) as key players in the processes of attachment and alienation. Based on the process diagram, “place dimensions”—qualities of space that affect attachment and thereby alienation processes—were identified. These qualities afford a child some control over his/her experience of place and afford the opportunity to express his/her identity in the process as well.

Development of place dimensions helped answer the second question that involved defining alienation. Since the concept of alienation is grounded in place attachment theories, alienation was defined as feelings of detachment arising from restrictions on use and personalization; or put another way; they arise from an inability to control environmental experiences because of limited affordances for expressing identity. The theoretical framework thus developed was used to analyze a double-shift schools as a case study: Fr. Agnel Multipurpose School. Even though three schools were used as case studies, data was extensively collected for Fr. Agnel School and hence is extensively analyzed in chapter 3. Subsequently, observations made and data collected at Fr. Agnel School were analyzed using the framework in order to identify “attached spaces” and “alienating spaces.” It was noted that, both the primary and the secondary school children clearly valued the spaces that afforded several types of uses and
accommodated the needs of diverse groups. The children also valued places that allowed them to take control of and alter their experience of the place, and they did not care for spaces that restricted their activities. The case studies brought forth concrete examples of alienation supported by the built environment, and, they, therefore, helped to substantiate the theoretical framework.

The third objective of the study focused on developing design strategies in order to create valuable school spaces that would provide opportunities for children to feel connected to their school spaces, thereby reducing feelings of detachment. The place dimensions supporting the formation of attachment were used as a framework to structure and focus the design strategies and corresponding attributes to create spaces conducive to the formation of attachment. From the case study analysis, the environmental attributes of adaptability, accessibility, and control emerged as vital to the associated processes of developing attachment to the school (place) and of reducing alienation from it. These attributes were incorporated in the design strategies, as they helped in realizing the place dimensions. In order to create spaces conducive to the formation of attachment, the design strategies aimed to (1) provide opportunities for greater interaction with the school spaces, and (2) create architecturally diverse and flexible spaces to support the demands of both primary and secondary school children.

While the design strategies do not offer a clear-cut solution to the problem of alienation in double-shift schools, they nevertheless contribute to attachment formation. Therefore, they should be taken into account in designing double-shift schools as well as other buildings.

5.2 **POLICY AND RECOMMENDATIONS**

Even though the shift system is a method that makes maximum use of resources, both in terms of land and money, it has a negative impact on the quality of education,
student performance, and the overall experience of learning. While the crunched school day is the primary reason for many problems faced by the double-shift school, the “one size fits all” attitude adopted by architects while designing such schools aggravates these problems further, and in particular the problem of alienation experienced by the children. Cookie-cutter solutions generated by application of a thumb rule standard are as a result of architects, and school boards turning a blind eye to the unique demands of each age group (6-10 years for the primary school and 13-17 years for the secondary school). It is important that architects take into consideration these different age groups, their school curriculum (primary and secondary) and consequently the different demands from space in order to design a school environment that is flexible and adaptable to different users and their needs. Architects, throughout design development, should collaborate with school boards, teachers and even students to get a better understanding of not only the curriculum but also the specific needs and opinions of each group involved in the project. Understanding ‘what the children want’ and their demands from space is especially vital to designing a successful double-shift school environment. While it is monetarily difficult for architects to conduct extensive surveys to gather children’s opinions and expectations of their school building environment; governmental education agencies should take up this cause as a part of their drive to make basic education more accessible. Since a majority of government funded schools in Mumbai operate in multiple-shifts, the governmental education agencies should initiate and sponsor studies that survey double-shift schools in order to understand the needs and opinions of school children and teachers in regards to their school building environment. Such initiatives should also rope in architects as well as children’s NGO’s.
5.3 LIMITATIONS

The emergence of double-shift schools in India is a consequence of the shortage of land and monetary resources. By making maximum use of the existing educational infrastructure, double-shift schools are able to reduce school fees, cater to the educational needs of an ever growing population and, make primary and secondary education more accessible. Despite all these advantages, double-shift schools suffer from several disadvantages. They lead to a shorter and crunched school day, thus reducing the time children spend at school. This not only affects the quality of education and lessons, but also, children's school experience as well as their sense of belonging towards the school. As the quality of education is affected, parents turn towards out of school coaching and private tutorials. The private tutorial industry thus thrives on the shortcomings of the double-shift system. As a consequence, children spend the entire day in some kind of learning environment, be it the school or the tutorial class. This leads to reduced time at home with family and, playtime with friends. Also, there is added pressure on children as they now have to work extra to perform well in the tutorial class and school. As a consequence of private tutorial classes, children tend to take school lessons lightly, and this affects class participation as children become more restless. In turn these factors have a negative impact on teachers. As student response and enthusiasm about lessons decreases, teachers no longer feel encouraged to go that extra mile to make lessons more interesting. These factors affect the overall quality of education, student performance and school experience.

While these issues negatively affect the shift system, children and their families, this study does not explore the increased stress on the child in relation to the loss of attachment to place. Nor does this study delve into restlessness and, reduced interest in school lessons among children and their contribution to loss to attachment to place.
However, this thesis posits that the school environment contributes to feelings of alienation and focuses on exploring ways to improve the responsiveness of the school environment in terms of the internal environment of the school building itself. The chief concern of this research is the role of the environment in the formation of place attachment or lack of it and the dimensions of place that influence it.

5.4 FURTHER INVESTIGATION

As stated earlier, the insights provided in this thesis are not meant to be all encompassing; rather, they serve as a basis for additional exploration into the issue of alienation from and attachment to the built environment in a double-shift school. The study leads to several additional directions that stem from different viewpoints on the concept of attachment. My thesis concentrated on the physical dimensions that contribute to place attachment and alienation respectively within the double-shift school environment; yet, examining space in terms of its function as a social environment in order to understand the role of social ties in engendering feelings of attachment and alienation is a related direction that is worth pursuing. Further, a study that explored both the physical and social dimensions of belongingness would be likely to yield a more comprehensive view of attachment to and alienation from the built environment. An understanding of the social dimensions of attachment in conjunction with the physical dimensions of attachment proposed herein could reasonably be expected to produce comprehensive well-rounded design strategies for creating optimum multipurpose spaces in double-shift schools.

Population statistics mentioned in chapter 1 indicate that even though the growth rate of the population of Mumbai has stabilized, limited land and monetary resources will still play an influential role in policy decisions regarding provision and operation of civic amenities and urban infrastructure such as schools in the future.
consequence of this scarcity, the double-shift school system has emerged as not only an efficient model of resource management but also as a place where children of different age groups and social backgrounds can interact and learn from their differences. As a result, the shift-school may become the preferred mode of operation, adopted and promoted by many city education boards. While the currently popular ‘end-on’ model may sustain in the future, it could also morph into triple-shifts or overlapping shifts. The former will accommodate three shifts (triple-shift) wherein, the third shift may involve community activities in order to connect the surrounding neighborhood and the school community, and the latter will have overlapping shifts so as to create mixed learning environments and promote socialization among different age groups. Hence, it is vital that education policy makers, school boards as well as architects realize and declare the shift-school as a legitimate building type and not a makeshift solution. Only then will there be an organized and collaborative effort to study the model’s operation, education advantages and drawbacks, as well as how they influence spatial planning and design of the school building and vice versa.

This thesis is a steppingstone towards generating more awareness about the present-day double-shift schools, issues such as alienation from school spaces and conflicts of ownership over spaces that are related to or even result directly from design decisions. The thesis recognizes the importance of children’s spatial preferences, such as personalization, territorialization, and control of experience, as contributors to the formation of place attachment. Finally, it is the conclusion of this thesis that these strong preferences be understood as constituting important parameters for design that seeks to maximize and optimize the use of contested space for double-shift schools and similar environments. It is only by understanding place attachment and the features that foster its development that architects will be able to offer spaces capable of rendering the school experience fulfilling in terms of personal, social, and educational development.
Only in this way will the double-shift school in particular become a place and experience that will produce educated children, who as adults will possess cherished memories of their time at school.


http://www.mmrdamumbai.org/


