CHAPTER 6

FINDINGS, CONCLUSIONS AND SUGGESTIONS

6.1 Introduction

6.2 Findings of the Study

   6.2.1 Findings related to Classroom Essential and Student Behaviour, Learning
   6.2.2 Findings related to Classroom Fittings and Student Behaviour, Learning
   6.2.3 Finding related to Classroom Environmental Conditions and Student Behaviour, Learning
   6.2.4 Findings related to Corridor and Amenities and Student Behaviour, Learning
   6.2.5 Findings related to Social Characteristics and Student Behaviour, Learning

6.3 Conclusions of Study

6.4 Discussion on Research Questions

6.5 Suggestions

   6.5.1 Policy and Suggestions
   6.5.2 Design Strategies

6.6 Contribution of the Study

6.7 Scope for Future Research
6.1 Introduction:
The premise of this research was that social, spatial characteristics of primary school buildings contribute in improving student’s behaviour and learning outcome. So this study focused to indentify the social characteristics of school; spatial characteristics of classroom and corridor and indentifying activities related to student behaviour i.e. social interaction and passive exploration. In addition to this, the study also paid attention to user’s opinion about their classroom and school. As discussed earlier, user’s opinion was obtained by student’s and teacher’s questionnaires.

This research is based on the concept that a building is a third teacher and thus indentifying probable correlation and contribution of the spatial characteristics to student behaviour, learning was necessary. Statistical results of the research were discussed in the previous chapter with statistical analyses performed in order to find the facts available from data. The data was analyzed for relationship, association and strength of associations for evidence of statistical relationship. The data was also analyzed for correlation between social, spatial characteristics and student behaviour, learning.

6.2 Findings of the Study:
The social, spatial data collected, the questionnaire data relating to school and classroom, student behavior were analyzed with spearman rho correlation, as discussed in the earlier chapter. Further the contributing characteristics strongly associated with student behaviour, learning was found out.

Figure No. 6.1: Association of Spatial, Social Characteristics with Student Behaviour and Student Learning

(Source: Primary Source)
The associations found were positive and if betterment is done in social, spatial characteristics it will improve student behaviour and learning. Finding of the study are discussed in detail as follows:

### 6.2.1 Findings related to Classroom Essential and Student Behaviour, Learning:

Age of school building is a contributor to student learning. Old buildings do affect student behaviour and student learning. Proper maintenance of school building and particularly cleanliness of toilet and cleanliness of school premises or overall renovation will help in improving the age of facilities and in turn the age of the building. The analysis supports the findings of previous studies by McGuffey regarding the relationship between age of building and student behaviour, learning. Earlier study by Hickman, shows that student behaviour is affected by age of school building; suspension rates were found to be lower in the newer school. The age of the school was not a major influence on student attendance or graduation rates in this study.

Even if the desired classroom area exists, the difference in Classroom dimensions altered the classroom proportion. Classroom Proportion is related to cone of vision while blackboard is used as a medium. Teacher’s movement in class in ‘T’ shaped flow reduces with change in proportion (1:1.5) affecting teacher’s movement and interaction for student’s seating in back rows in the class. In majority of schools, Classroom proportion inclines towards 1:1 i.e. a square classroom. The distance between student and teacher is reduced but the cone of vision considering the blackboard gets disturbed when compared to overall classroom size. Student strength per class is well connected with class room area and in turn teaching. Students comfort level within class will depend on classroom area since sense of overcrowding in class disturbs student’s concentration.

### 6.2.2 Findings related to Classroom Fittings and Student Behaviour, Learning:

As observed in majority of the schools, teachers deliver lectures in standing position and students listen to them seated at their seats. Teaching contents are explained with help of chalkboard. A blackboard and teacher’s desk in front of the classroom encourages a focus on the teacher as the resource for learning. The straight rows tell the students to look
ahead and ignore everyone, except the teacher and the students are jammed so tightly that psychological escape and physical separation is impossible. Chalkboard is used for teaching mathematics, science, languages even art, drawing classes for minimum three hours a day. Minimum clear distance between the chalkboard and the base of chalkboard should be strictly maintained which is supposed to be monitored by the School Inspection Committee.

For writing or reading tasks, light over left shoulder is ideal, and the chalkboard board position is suggested by keeping the same in mind and hence it cannot be ignored by the planners while orienting the classroom. Both students and teachers prefer to have storage place, in classroom to keep teaching learning materials. Display acts as one of the learning element, silently observed by students. Nonverbal education takes place not only in classroom but also in transitional places. Students lose curiosity in fixed display of maps, educational charts or walls painted with full information and hence display should be made mandatory to schools.

Basic categories of design features based on ‘good practice in school design which should be used for a new school or for the redesign of existing spaces (EFEI) includes space as one of the feature. Users view regarding display point to wall of fame should be made available to display the achievements of every class. Abstracts and concepts should be displayed through wall paintings so that that they do not fear for learning abstract ideas. From the study, it can be concluded that School walls should be colourful and expressive. Students should a get sense of belongingness and for that a display area has to be maintained for every class / floor.

6.2.3 Finding related to Classroom Environmental Conditions and Student Behaviour, Learning:
The issue of human comfort cannot be addressed without thermal comfort. There are many parameters related to thermal comfort but basics requirements of light, ventilation and noise associated to classroom are considered for the study. Windows provide natural light and ventilation and connect the outdoors. Inflow of fresh air is a requisite. Point no.
8.4 in Draft Guidelines for Whole School Development Planning under SSA, 2010 confirms view about optimum day light which state that all schools must be designed for optimum daylight and good ventilation should be ensured to maintain comfort. The air inlets and outlets should be distributed in such a way as to allow air movement at sitting levels of children (cross ventilation). Light in classroom should be provided either artificially or natural lighting through windows.

Light also helps for building an environment in which student see without glare problem. Solely natural light is not enough considering monsoon season in study area; to achieve effective lighting in classroom artificial lighting is provided in the form of light fitting. From the study it can be concluded that light fittings are needed especially in morning shifts schools and appropriate fitting and their position as per seating lay out are equally important. Cross ventilation is a priority but site conditions differ and so do the ventilation strategies. Proper window percentage if maintained can help mitigate issue. Number of fans to be put in classroom and strict maintenance of the same should be school’s responsibility. Window area percentage can be increased depending upon site location and seasonal variation of composite climate of Pune.

Schools should be designed with singly loaded corridor with floor plan resembling “C, L, U” shapes, and school should be well ventilated. While designing the school building proper care should be given. Disturbance due to external noise lessens the speech intelligibility. In general classroom doors and windows are kept open during the lecture hours for light and ventilation but due to this the background noise in classrooms gets increased thereby affecting the speech intelligibility in classrooms. Control of External noise and internal noise and quality of hearing perception are aspects for Classroom acoustics. Classroom acoustics do play a role in student’s academic performance. To improve the speech intelligibility in the classrooms few cost effective suggestions are required for classrooms in existing schools located in mixed land use area.

Door provides access as well as connects indoors to transitional space as observed in majority of schools. Provision of two doors to each classroom and minimum width of
door as 1200 mm is required to be emphasized to school principal and management considering fire safety. Colour is a definitely a constructive component in schools; application of light colours in corridors, green spaces in school are much appreciated by students. Although no quantitative measures have been identified in earlier research, colour is supposed to influence student attitudes, behaviours and learning, particularly student attention span and sense of time. It is also believed that carefully planned colour schemes can influence absenteeism. Light colour in classroom and display will make the classroom colourful.

6.2.4 Findings related to Corridor and Amenities and Student Behaviour, Learning:
Corridors are not just connections but they are internal streets directing movements of student and providing a meeting place for friends from other classes also. The corridor should have minimum specified width to support the said. If the corridors are full of display and with little variation width it will increase curiosity.

Figure No. 6.2: Permanently painted information, Pin Board for picture, information along the corridor

(Source: Field Work)

As observed, corridor is a multipurpose space during recess time as well as a spill over space of classroom. Maximum during recess or break time as well as 10 - 15 minutes before school timing this space is used as hangout space and for physical games, completing homework etc. Schools with central courtyard with corridor all around, this
quadrangle create space to view activities in courtyard, though not actively participating in activities, students passively explore the happening.

**Figure No. 6.3: Central courtyard in schools studied**

Figure showing central courtyards in schools studied. (Source: Field Work)

At times the linear way can be monotonous. Looking over the solid parapet wall with M.S grill is little difficult to watch activities. Corridors can be just treated as connection as it is a social connect.

Play ground is part of school image and many times children fall down but still the time spent playing game with friend cannot be forgotten. Garden adds a green space with opportunity to experience and flourish throughout the year. In order to ensure planned development of school infrastructure, a measured campus plan should ensure play ground within school premises (SSA Annexure -2). The play area must be developed so that it is safe, rugged and provide opportunities to all children concerning interaction and health. School ground is a necessity considering urban area also.

**6.2.5 Findings related to Social Characteristics and Student Behaviour, Learning:**

The associations found were positive with low correlation. If social characteristics are strictly supervised, it will improve student behaviour and learning. School type is a decisive factor for school including infrastructure. Funding mainly depends on school type as well as on school management planning policy. School management is a dominant factor and other important components are student-teacher ratio, class size,
trained teachers, employment status (permanent / temporary / contract) of teachers and years of teaching experience in influencing the quality of primary education. For this research study the main concern is about the provision of adequate facilities in classroom. Funding received through SSA needs to be properly utilized, as self appraisal form to be filled by school principal apparently ask for comprehensive marking. 86 marks out of 300, a considerable percentage of marks, have been allotted for infrastructure.

School size (number of students in school) is being a debatable issue based on teaching pedagogies and government policies. With increase in school going population school size is going to be crucial unless new schools are built. The effectiveness of school size is one of the important elements in student’s academic performance and affects their socio-physical aspects. Present study shows a low positive correlation between social characteristics and learning but it differs from Williamson (1998) which had a negative correlation between student academic achievement and school size. Achievement tended to be lower in schools when the school’s size was larger.

Attendance is normally monitored by class teachers and school authorities. There are many factors like student health, family functions, teaching learning process etc. which affect the attendance. School size is also linked with classroom size. Class room size i.e. number of students per class if increased, gives a sense of overcrowding. Increased number of students per class means less free movement in class, disturbing classroom layout and leads to reduction in teacher’s movement in class. Increased school and class size increases opportunities in formation of school group and the frequency of seeing each other also develops. Activity pockets should cater to these needs of this age group.

Mid Day Meal serving is another area which requires consideration and also hygiene issue are linked with it. Hygiene should be the priority of schools. Students and teachers are much anxious about the cleanliness of classroom and other school facilities and unclean facilities leads to less use of facilities.
The hidden responses were unlocked from inside of respondents’ hearts specially teachers because they were asked to express their feelings and concerns regarding the existing condition of their schools. Student teacher ratio, flexibility in classroom layout, adequate playground for schools, use of ICT facility in regular teaching were the concerns to name a few. Students are also exposed to ICT due to growth in the availability and amount of learning information. It will be wrong to assume that teaching in classroom is altered by the changes in information technology; however schools and policy makers are aware of the changing scenario to an extent. Sense of belongingness requires to be built with proper maintenance, school renovation or uplift of facilities.

6.3 Conclusions of the Study:
Primary education will continue to be the main mission of the Government of India to achieve goals set for UEE. Recent scenario and change due to globalization have effect on primary education like an increased awareness of how young children learn; teaching learning material and use of the same by teachers. The analysis of the classroom layout
reveals that the layout follows teacher’s desk and rows of desks in front arrangement with no variation in arrangement. The teaching technique used is that the teacher is delivering and the students are focused to hear carefully. There were differences in size of classroom and corridor, verandah sizes; overall corridor looping centrally or in one corner with vertical access was observed.

Intersection of the corridor and staircases which were interaction points as observed showed that incidental meetings among students from other classes occurred. The more spread out school building layouts with a central courtyard indicated social integration and visual connectivity more in students. Conclusions were drawn from the present study as:

i. A significant positive relationship was found between spatial characteristics and student learning when data from all 31 schools was analyzed.

ii. A significant positive relationship was found between spatial characteristics and student behaviour when data from all 31 schools was analyzed.

iii. Classroom essentials and environmental conditions in classroom were the main contributing factors accounted for student learning.

iv. A significant positive relationship was found between spatial characteristics and student behaviour (Friendship, Sense of belonging, Sense of Community, Cooperation, Exploration).

v. Students believe that Classroom is the best place in school;

vi. Variation in classroom layout was observed and connection to corridor, the overall activities indicated uniformity, with school discipline a major factor.

vii. More social interaction depends upon the size of the space and visual connection in transitional spaces within School.
viii. Developmental needs of students (for age group 6-14 years) demand variety of spaces, hands on experience, play areas; if not provided they adapt to facilities / situations which are offered.

ix. Teachers are not aware of the new initiative as building element can be used as learning aids.

x. Dialogue with parents and school management is essential for understanding school building as a third teacher concept.

xi. Implementation of Universal design guidelines to accommodate children with special needs in existing schools requires more design and financial support.

6.4 Discussion on Research Questions:
School buildings serve many generations ahead and to the society. School buildings should be able to offer an opportunity to adapt new ways of learning. Schools need to develop policy plan to accommodate such changes. This research was focused to find the spatial characteristics influencing student behaviour and learning so as to make suggestions which will be helpful for school architects, management and policy planners in addition to existing byelaws. The following discussion is intended to answer the research questions put for the research study:

1. What are the social characteristics with respect to school?
Every school provides to its students a social environment in addition to the physical environment. A learner is not alone in a school. He / she is surrounded by other learners as well as the influential adults, the teachers as per Bronfenner’s Meso system concept. School is been looked as social environment comprising of varied users, Students are individuals but they share a social context, i.e. their class and the school they attend. To answer the above research question, literature review, expert opinion and norms under SSA have been referred. Social characteristics for this study are also inspected by Zilla Parishad, a local school sanctioning authority once every year or once in two years. Social characteristics have been indentified considering the basic requirements of school
and student behaviour parameters. Thus social characteristics identified for this study include school type, school size (no. of students enrolled in school), student teacher ratio, attendance and midday meal. The positive association between social characteristics and student learning gave direction for further discussion regarding improvisation of each parameter. School management and principal have to identify the issues at school level also at local governing level for improvisation. Student teacher ratio if monitored will reduce sense of crowding in classroom; classroom space can be managed properly same with attendance. These characteristics cannot be thought separately need to relate with spatial characteristics like classroom area, corridor as well as student – teacher interaction.

2. What are the spatial characteristics with respect to classroom space, corridor of school?

In response to the above question, the spatial characteristics have been confirmed from referring IS CODE 8827(2006) and UNESCO child friendly manual and from experts interview. Self appraisal form for school by government to be filled by school principal has been in practice. Informal discussion with principals regarding SSA infrastructure norms and study of day-today working in school helped in this process. Spatial Characteristics have been identified as independent variable basically includes classroom and corridor and amenities parameters. There are twenty three parameters identified related to classroom space listed for data compilation. They are further grouped into four main variables as Classroom essentials, Classroom fittings, Environmental Conditions and Corridor, Amenities. Further each variable is subdivided into parameters based on literature review, IS CODE 8827(Reaffirmed 2006), and researcher’s observation. Then corresponding questions relating to variables were grouped under the same category. This subdivision is already explained in methodology chapter. The data compilation, analysis of spatial characteristics was worked on the same. The association was worked for the main variables. Further the association and linear regression was computed.

3. What are the activities related to student behaviour & factors related to learning in schools?
The review of literature related to student behaviour gave reference to identify the behaviour characteristics or activities. The student behaviour was observed; this observation noting was analyzed to find the activities during recess timing, 10 minutes before school timing with respect to classroom and transitional space. These activities were grouped on basis of frequency of occurrence. Observation and questionnaire data supported the student behaviour as studied through literature i.e. social interaction, passive exploration. From grouping of activities, informal discussion with respondents, experts from psychology parameters were finalized as Friendship, Sense of community, Frequency of knowing each other, Cooperation, Exploration, Visual connectivity, Sense of belonging. These parameters also stand as per cognitive development theories by J Piaget and Vygotsky; the need of this age group (6-14 years) is interaction with real situation and peers; experiencing reasoning situation can occur in school where students spend maximum time of their waking hours. Student learning can be explored through many perspectives but considering assumption and limitation of the research study, continuous comprehensive evaluation (CCE) as specified in RTE Act 2010, Government of Maharashtra was studied and used as dependant variable for the study. The grades or marks allotted by class teacher form the basis for further analysis.

4. Is there any association between social, spatial characteristics and student behaviour, learning in primary schools?

For all 31 schools, five social characteristics were identified together as a set of data. The same was followed for spatial data; it was divided into four major categories with 23 subheads. Hypotheses formulated for testing were based on these grouping. As explained in earlier in Chapter 5, testing of hypotheses revealed a positive association between social, spatial characteristics and student behaviour, and learning. The statistical significance was worked by spearman r. These tests were performed for all independent and dependant variables.

5. Contribution of social, spatial characteristics in student behaviour and learning in primary schools?
The interface between education and design has remained relatively unexplored with educators being mainly concerned with student behaviour and designers with aspects of the physical environment. The analysis of this study indicates that there was a statistically significant association between classroom essentials and student behaviour, learning. However the environmental condition is significantly associated with learning. The findings of chi-square test in the earlier chapter, gives the variables which need to be taken into account while designing the classroom. Students and teachers opinion obtained through questionnaires, associations from statistical tests together; prove the core premise of the research study that the social, spatial characteristics of primary school buildings contribute in improving student’s behaviour and learning outcome.

6.5 Suggestions:
The findings of this research study are synthesized to offer recommendations for the design of classroom and school as well. This research has indentified the relative importance of classroom essentials and environmental conditions in classroom which are the contributing factors to student learning in terms of significance of association. Therefore some practical measures are needed to provide classrooms of adequate standard in schools. The researcher proposes a bi-facet action plan for the achievement of this aim.

a. Short Term Micro Level Action Plan: It is proposed that all the schools should adopt necessary spatial standards in classrooms by effectively utilizing the available resources. Adequate provisions in classroom will raise the level of confidence in the students. As per basic norms, provisions in classroom like light and ventilation may be ensured. Micro Level Policy Framing Schools in their individual capacity may clearly define policies to ensure the provision of quality classrooms within the limited resources. The available seating capacity in the school will govern admissions to the class. A portion of the annual budget should be utilized for the repair and installation of light fixtures to guarantee the provision of adequate light in the learning space and fans to ensure the circulation of air inside the classrooms.
b. Long Term Macro Level Action Plan: Government and PMC school board have to consider strict monitoring and give due respect to the pre-defined standards as per SSA and local building bylaws for classrooms as well as for school buildings. An incremental up-gradation of the existing school buildings with specific emphasis on classroom spaces may be planned and special funding provisions as per SSA guidelines to be utilized for this purpose. It is further proposed that a part of policy document can be devoted to increase awareness towards importance and role of school building on student. This awareness will help parents, teachers and experts from fields like education, psychology and society as a large. Though national educational policy document clearly states the objective to achieve universalisation of elementary education; to get the required results it is proposed that the subject of “PROXEMICS” and the psychological impacts of classroom design and articulation should be compulsory in teachers’ training institutions. Each new school building may individually be designed with the consultation of qualified personnel of the field of architecture so that the site-specific climatic, topographic and socio-economic characters can effectively be utilized in school building design for the provision of quality learning environment.

6.5.1 Policy and Suggestions:

The research findings related to student behaviour and academic performance, taken into account and included in the whole school development plan, will be a step towards child friendly school. The research findings highlighted the factors related to classroom dimensions and environmental conditions contributing to learning. Based on these, the recommendations of the researcher are as follows:—

1. Lippmann (2007) has argued that in the past the prevailing teaching approach was whole-class instruction and the focus was on passive (rather than active) learning. This was reflected in inflexible and ‘traditional’ classroom layouts with the teacher’s desk typically positioned at the front of the room, teaching and giving instructions about the curriculum, while students were seated in rows, listening and recording what they were being told. The classroom layout considering flexibility and adaptability has to be achieved to make both users comfortable.
2. To deliver best and effective education at primary stage, all the possibilities of the information and communication technology should be explored and the school building needs to reflect these advancements of technology. Pupils are most positive about different learning methods and would prefer a greater use of ICT in everyday lessons so classroom spaces that are well proportioned, should be designed which are fit for the purpose for next few years.

3. Varying classroom arrangement for various group activities, group sizes to be decided as per teaching pedagogy.

4. Classrooms should allow ease of use and multiple learning formats without much physical modification during classes. The classroom furniture can be made lighter so that students also can move desks if required for group work.

5. Currently the distance between two rows of desks does not facilitate ease in movement. Hence, student strength per classroom should be strictly monitored to achieve ideal layout for expected class strength.

6. The shape of the classroom should preferably be rectangular as specified in standards. Cautious deliberation of room depth is essential in relation to daylight level, natural ventilation and view out.

7. Students display boards need to be provided at reachable heights so that variety in display can be achieved.

8. Classroom walls can be thought as changing canvas for students’ drawings, charts and current information instead of oil painting with fixed mathematics.

9. Provide adequate storage space in classroom reducing the burden of school bags, supporting government’s initiative “school without school bags”.

10. Minimum door width as per norms should be followed with double door opening outside preferred.
11. Sliding Windows with translucent glass along corridors will increase visual link, ease of movement in corridors as running in corridors, fast movement will be without hindrance which accompanies discipline issue.

12. Dining area in school is a need considering daily Mid Day Meal, hygiene, and interaction. If new construction is not possible, revision in school layout should be done to maintain cleanliness required in dining area.

13. Noise should be reduced by using cost effective solution like use of curtains, plantation along road side etc, especially in mixed land use area.

14. Lighting fixtures and window panes may be well maintained to ensure adequate light and acoustic quality in the classroom.

15. Provide easy physical as well as visual access to all facilities since students feel part of that environment constantly.

16. Design of transitional spaces especially corridors need to be more focused as they enhance social interaction as well as passive exploration. The display in corridors support as teaching learning material, if changed periodically, also increases curiosity.

17. If common seating area or discussion space is provided along the corridor it will be a place for delight.

18. Though railing / parapet wall in corridors as per standards is required, little variation can be done by colouring some portion in black, converting it into children’s chalk boards.

19. Small zones can be created in lobbies or along the corridors to increase group discussion or group projects increasing outdoor teaching.
Some play space also can be provided near staircase lobbies, along the length of corridor, as many students especially girls prefer staying nearby to their classrooms.

The school planning considering all factors relating to environmental conditions has to be achieved to make students comfortable and friendly to classroom environment so that they can explore the changes and actively engage themselves in their classroom. It should also be noted that the shape, colour scheme of the walls, layout of furniture and flooring, amount of daylight and the room arrangement will all influence how students learn. Classroom environment should be pleasant and comfortable for learning, need to be for wider use, binding to users. Focus should be to achieve creating innovative and stimulating environment to achieve best learning outcome with the help of teachers.

6.5.2 Design Strategies:

The school is envisioned as child development friendly, inclusive and learning resource-rich system through culturally and environmentally sustainable practices. Thus attempts are needed to inspire them and give enough insight to start and take the process of school planning forward towards betterment. Activities observed in a formal learning space -- classroom, involves formal learning, art and craft work, colouring, individual and group project work involving cutting and pasting etc. Student strength in classroom, desk arrangement cannot be altered. Corridors also do not serve the purpose.

Participation of users, Universal design parameters inclusion need deliberate effort so it strengthens the learning of all. Following few strategies can initiate the thought process; this is the beginning which will improve the spatial characteristics and consecutively the student behaviour, learning. The suggestions of the researcher regarding the design strategies have been presented in table no. 6.1 to 6.6.
Table No. 6.1: Design Strategy No. 1 - Flexible Class Layout

<table>
<thead>
<tr>
<th>Classroom essential Desk arrangement</th>
<th>Allow flexibility in space</th>
<th>The classroom layout maintaining student teacher ratio 1:40 should be easily changed as per activities; furniture also need design consideration necessary for easy movement.</th>
</tr>
</thead>
</table>


Table No. 6.2: Design Strategy No. 2 - Classroom for future - Class Layout

<table>
<thead>
<tr>
<th>CLASSROOM FITTINGS</th>
<th>ICT –Information Communication Technology</th>
<th>Use of computers in teaching can be initiated in classroom replacing traditional chalkboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD screen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Work

Source: Creating excellent primary schools A guide for clients-CABE.
### Table No. 6.3: Design Strategy No. 3 - Class display

<table>
<thead>
<tr>
<th>Classroom fittings</th>
<th>Display</th>
<th>Use of display in teaching can be initiated in classroom, need to incorporate the visuals learning aids supplementary to verbal communication by maximum using the space in classroom.</th>
</tr>
</thead>
</table>

Source: Field Work

### Table No. 6.4: Design Strategy No. 4 - Building elements as learning aid

<table>
<thead>
<tr>
<th>Building element</th>
<th>Develop the BUILT ELEMENTS in Classroom/school spaces as teaching-learning aids; also aid for passive exploration.</th>
<th>As initiated through SSA, building elements can be modified with minor interventions to become teaching aids specially for 1-4th classes</th>
</tr>
</thead>
</table>

**Table No. 6.5: Design Strategy No. 5 - Classroom acoustics**

<table>
<thead>
<tr>
<th>Environmental conditions</th>
<th>Noise –treatment to surfaces</th>
<th>A good acoustical environment will increase comfort in classroom particularly in mixed land use area.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="http://www.acousticsfirst.com/SonoraWallPanels/SonoraWallPanels_vertical.png" alt="Acoustic Panels" /></td>
<td><img src="http://www.acousticsfirst.com/SonoraWallPanels/SonoraWallPanels_vertical.png" alt="Acoustic Panels" /></td>
<td>Add acoustical wall treatments and “space absorbers” (baffles)-additional pin boards also help to reduce external noise consecutively increasing display area. Install a suspended acoustical ceiling in a classroom may be in form of light weight ceiling with jute, thermocol etc.</td>
</tr>
</tbody>
</table>

**Source:** [http://www.acousticsfirst.com/SonoraWallPanels/SonoraWallPanels_vertical.png](http://www.acousticsfirst.com/SonoraWallPanels/SonoraWallPanels_vertical.png)

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**Table No. 6.6: Design Strategy No. 6 - Corridor – activity pocket**

<table>
<thead>
<tr>
<th>CORRIDOR, AMENITIES</th>
<th>Support Group Interaction, Activity Pockets</th>
<th>The corridor or verandah connecting classrooms can be spillover or designed with variation in width creating space for small groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Field Work](Source: Field Work)</td>
<td>![Field Work](Source: Field Work)</td>
<td>(Source: Field Work) (Source: Field Work)</td>
</tr>
</tbody>
</table>

(Source: Field Work) (Source: Field Work)
The design strategies presented above is first which can be adapted to achieve ideal. It can be stretched to fullest achieving model classroom environment with site, context specific design ideas. The design strategies presented in this chapter focus on creating interesting and flexible school spaces that can be adapted to varying user needs and support feelings of belonging.

6.6 Contribution of the Study:
Earlier studies put forward relationship of school infrastructure (general condition) to student behaviour and learning outcomes. Edward Edgerton considers that there is still lack of empirical based evidence that examines the relationship between school building and their users. In this regard this study tried to examine the relationship between spatial characteristics of classroom environment and the users. Though with considerable budget available, it is still difficult to say excellent schools are built as users are not in design process as yet. With decentralization as per the 84th amendment, process of involving community has started while building new schools. A step definitely appreciated but need some research based knowledge to achieve the objectives put forth by the Government.

The findings of this study have provided statistical association between basic components of a school system, a value addition for creating a child friendly environment. This may help to understand the importance of investment in classroom and in turn school. Existing solutions adopted for school designs are not incorrect but school principals, management and architects need to note the contribution of design, specifications which contribute in positive relationship between spatial characteristics of classroom and learning.

Non participant direct observation and student’s opinion proved to be helpful for understanding the use of classroom space and flexibility required. By understanding user’s opinion and behaviour in physical environment, this study provides a picture that more positive behavioural effect and academic performance can be achieved if the children are given the possibility to interact and learn in better learning environment. Local administrators should hire experts in order to develop a comprehensive building
assessment for improvement in classroom parameters so that schooling becomes a memorable experience.

This study gives a valuable insight into association of spatial characteristics and student behaviour and learning which are the vital components of a complex system; school. This study touches references from disciplines like psychology, education, environmental psychology and the study can be extended in these interdisciplinary fields related to primary school and student. This study has observed the association between variables in schools following SSC curriculum which is widely followed in the state. The study is of great importance for school administrators, teachers and parents as to how school facilities can be improved for better academic performance and behaviour of students. The study will help to develop a proper understanding of the situation and motivate the concerned authorities to conduct further district / state / national level study on the same.

6.7 Scope for Future Research:
This exploratory research with Indian context involved disciplines like psychology, architecture and education. Doing it for the first time from the architecture point of view for classroom and corridors, it can further be extended for the whole school in detail. This study has also generated scope for research considering other student behaviour parameters. The present study is limited to classroom space and corridors and can be investigated considering supportive spaces like art room, music rooms etc. and specially focused on outdoor spaces also to gain insight into research findings. The research findings related to association of environmental conditions and student learning can be investigated considering qualitative aspect of the same.

Similar study may be conducted for other curriculum schools and rural schools. The study can also be conducted with the sample of secondary school students. The results of this study can be tested and evaluated for existing schools with experimentation as before and after treatment of classroom space. Further research may be conducted looking at the needs of teachers as users. A similar but more exhaustive study can be conducted considering the parameters of universal design. Addition in design recommendations
materialized through this study can be done with focus on children with learning disabilities. Research relating to environmental behaviour studies with reference to students can be a guide for policy planners. The strategies are intended as a stepping stone.