

Flexibility-An essential criterion of community school design

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ABSTRACT

The primary objective of community school project is to provide low cost vocational training for the rural populace and to link up nonformal skill development in rural areas with the existing formal school system. In order to achieve this objective, two hundred community secondary schools were established over a period of four (1981-82 to 1984-85) years at different selected upozila head quarters. One thousand teachers were specially trained for this purpose⁽¹⁾.

A study and survey were organised in 1984 by the author in the department of architecture BUET on different types of government managed and privately organised community schools of Bangladesh. This paper is the outcome of this study. It is found from the survey that while government financed community school authorities went for five common and generalised trades, the privately managed community schools were selected about twentyfive number of locally demanded trades. It is also observed that the type, number and curriculum of the trades change from time to time and from locality to locality. A flexible type of school building is suitable for these changes to accommodate the newly demanded activities of the communities. This paper represents an attempt to elaborate on the subjective term 'flexibility'. The author also attempts to focus on the need, ways and means of achieving 'flexibility' in school building.

INTRODUCTION

School buildings are many a time the most important structure in the localities of rural Bangladesh. In very many landscapes school building is the largest and most dominating structure. School is by far the most important community facility in the society and community life to a great extent rotate round the activities of the school. Technical personnel and architects today are getting involved in the design of these buildings, specially so, through the Facilities department of Education ministry. Various elements contribute to the success of an educational building. Location of the building, spaces for various functions, circulation, layout and design, form and visual aspects are some of the major factors to be considered. In school building design another vital factor should essentially be given priority even at the initial phases of design. This important factor is flexibility.

According to architect Mathew Nowick the architects could be divided into two groups-those who practised functional 'exactitude' and those who practised 'flexibility'. These are two opposite concepts. Members of the first group believed that the truth of architecture was the exact expression of every function, and that when a building become technically obsolete, it was to be replaced by more efficient one. The second group, he said, believed that since the function of any building

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changes from year to year, each should be designed to allow changes to be made efficiently and economically without marring the beauty or distorting the truth of expression⁽²⁾. Considering the reality of our under-developed economy, it would not be wise to go for 'exactitude' concept of design. Rather school building could be designed with the flexible spaces for double or triple use considering our future crowded years ahead.

The curriculum and technique of education change with time. Changes are apparent in Bangladesh also. Science and other divisions are gradually being introduced in more schools. A rather new programme called the community school programme is already being advocated. This programme will try to take care of out of school children and drop outs along with regular students. In addition to its normal functioning as a school, the community school acts as a socio-cultural, recreational and educational centre participated by the people of all age groups for community activities utilizing the community resources in improving the quality of living. The school buildings are often being used as shelters for the less privileged section of the community, in case of natural calamities like floods and cyclone. When the term community school is mentioned, it will mean regular school with the new community programme added to it.

DESIGN PRINCIPLES FOR FLEXIBILITY

The curriculum and the technique of education change with time even within the same community. When some courses are added or taken away, the function of at least some of the internal or external spaces required for teaching courses, is changed accordingly. Education makes this change continuous which demands the change of the internal and external spaces of the school buildings. Therefore and in order that the available community school structure and the school campus be better utilised, should easily accommodate the growth, change and improvement.

GROWTH

Since for various reasons the community school building is not completed at a time, it must be planned from the very beginning for continuous growth and expansion. For this reason the end walls in each unit should not be load bearing walls. A truss supporting the pitched roof at the ends will facilitate putting up of additional bays. In case of concrete roofs an end beam will facilitate similar addition. In this way the community school buildings allow for flexibility and growth depending on future needs. The phasing at any time in the school building complex is essential. The extent of growth of any school building is not easy to predict, so the architects and designers should understand the pattern of growth of community school buildings. For this reason, we can arrive at a hierarchy of phases of construction for community school buildings.

CHANGE

The community school needs the internal or external changes both micro and macro levels. As, it is considered that a community school building is never finished, the changes are inevitable, therefore, it must be designed to grow without growing pain; addition may be very expensive if provision has not been made to accommodate them.

The change at any level may be both of qualitative or quantitative. The spaces classified and designed according to their functions may become obsolete after certain period of time. For example, in the case of micro level change, with the availability of better workshop equipments, the design and equipment arrangement within the carpentry and mechanical workshop may be changed. The macro change is applied to the level of change where the function of a particular area is replaced by another function. For example, community school during the initial stage might require only a smaller workshop for mechanical trade; but at a later stage when number of pupils increased, more equipments available and more staff is available, the mechanical workshop could be used to accommodate another function, such as the textile workshop. All these are based on the assumption that substantial economic and social development will take place in foreseeable future which is

essential for the survival of the community.

The change in the different places should be done in minimum cost and with the least disturbance of the pupils and users. The easy way to accommodate these changes is to standardise similar activity spaces as much as possible throughout the whole community school programme and within the modular system.

IMPROVEMENT

Construction method and the selection of materials for community school building should be studied in such a way that the system and materials employed should allow improvement from the standpoint of permanence. The system should be so flexible that the less permanent materials and components can easily be replaced by more permanent building materials and components. The ultimate objective is to construct permanent buildings with more permanent materials. The construction system and the materials can be specified in such a way that it is possible to construct relatively inexpensive but more flexible community school building which, when more funds are available can be improved as to become better and permanent structures.

ELEMENTS OF FLEXIBILITY

In reality it is very difficult to make a building truly flexible. The conventional and indigenous architectural style, common building materials, conventional structure and culture etc, make school designer's job very difficult. The degree of flexibility of school design depends on the different qualities of spaces. There are different elements that make the spaces of the school buildings flexible.

FLUIDITY OF SPACES

The open plan of different teaching and workshop spaces give to school architecture one of the important innovations in school design. The open plan affords a free flow of spaces in the main teaching area. By the use of large window and openings school designers can make inner space seem to flow to the outside and fuse with immeasurable space of nature. More planning techniques could be developed to take advantage of the fluidity of educational spaces.

VERSATILITY OF SPACES

The school spaces may be used for more than one purpose. The similar spaces could be combined for better use and for saving the cost of construction. Large space might have very many uses. Gymnasium and auditorium is a good combination; this might not sound very feasible within strict financial constraint. Assembly, examination hall, occasional meeting place etc. are other use for large space wherever available. In this way not only the class rooms or commonspace but corridors could be designed for more potential versatility.

CONVERTIBILITY OF SPACES

The skeleton structure with the temporary thin partition walls is suitable for the convertibility of spaces. The continuous changes in curriculum for adding and for taken away of the courses for satisfying the community needs, demands the characteristics of convertibility in school architecture. Therefore the school designers should develop the technique for dividing the educational spaces with light, thin and temporary partition walls. The school designers should give much consideration to the convertibility of interior and exterior spaces. However acoustics of various spaces should be taken into consideration.

EXPANSIBILITY OF SPACES

The increased enrolment, change of curriculum and the introduction of new trades etc. demand the

addition of new structure and spaces. A rational way is to 'plan' for expansion, but 'build' only for immediately foreseeable needs. Skeleton and skin construction is better adapted to planning for expansibility.

CRITERIA FOR FLEXIBLE SCHOOL DESIGN

Design criteria and space standards could be formulated to achieve the reasonable flexibility of the planning and designing of the schools in the context of prevailing socio-economic and cultural conditions of the community. The degree of flexibility depends on the achievement of these design criteria. In absence of such basic criteria for flexibility, it is difficult to carry out such complex operation to make a school design suitable for flexibility.

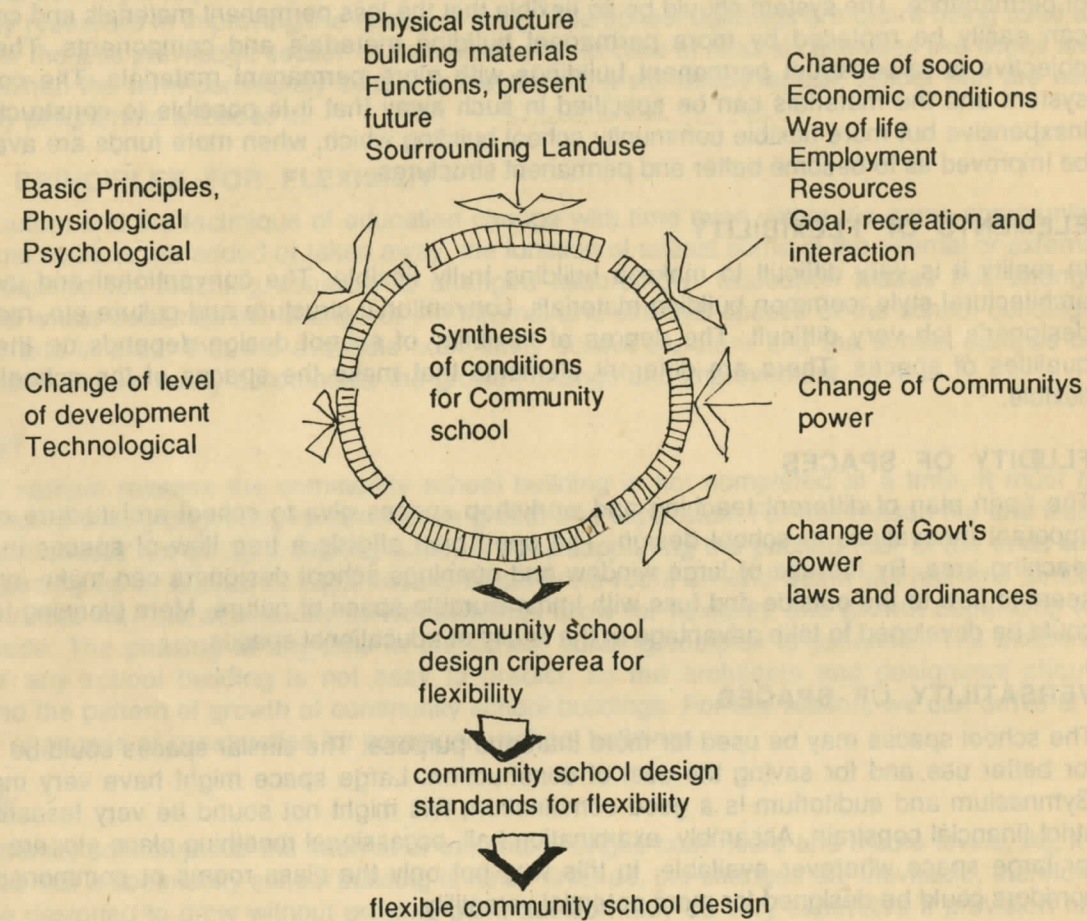


Fig. 1 Diagrammatic summary of the factors influencing the development of flexible community school design

LAYOUT AND DESIGN

The basic layout and pattern of school building are often derived from the rational arrangement of different school activities and functions, circulation and cultural heritage of the community etc. The simple elongated rectangular layout with gable roofing having varendah at one side facing the court or play ground is considered the basic or popular plan of the school building in Bangladesh. The court (sometimes the field) is considered as the basic reference for progression. The varendahs are considered to be meaningless without the court. This layout is independent of location of the site.

This layout is also independent of structural system, building materials, local technology and environmental factors. These are the modifying factors and do not change the basic layout; it only change the shape, size and the details of the school building. The school plan mentioned here is much flexible to accomodate all the changes, growth and improvement. As for example, the roof of the school building may be initially constructed with less permanent C. A. sheet. This hipped shaped C.A. sheet roofing can be changed by more permanent flat roof with R. C. slab and long overhanging in all direction, which does not require to change the design of the school building.

The layout of the school should be compact, leading itself to optimum economy. To make the school layout more flexible the primary activities and the building blocks of the different functions like class rooms, laboratories, administrative, library, common room, workshops etc. are to be grouped within the proximity around a main corridor. Entries are to be provided on both sides of the main corridor which ensure the problem of providing access to the school from all directions. Finger planning of school building is convenient to accommodate the addition of new functions in the schools.

STRUCTURAL SYSTEM

The skeletal type of structure is the appropriate approach for the flexible school design, where the structure is completely free of wall panels and allow greater possibilities of changes by rearranging the non-structural wall partitions. The end walls of the class room and laboratory blocks may have to be altered, so these should be left free; free from load, free from electrical utility installation, free from important fenestration. If trusses are used for the roof system, a truss should be repeated at the ene walls too, to make it easy for further alteration and expansion.

CIRCULATION

The adaptation of an open ended circulation system in finger plan design minimises the length of corridors and easily allow the change and growth by extending the existing corridors in the school buildings.

Corridor should be more functional than mere walkway and it should contribute to the educational gain of the users. The wall magazine, display boards etc. may be placed in the corridors at the entrances and other suitable places. The entrance to the school should generously be designed so that it is inviting and at the same time it acts as a space for exhibition, notice boards and wall magazine etc.

MULTI-USE OF SPACES

A school building design should satisfy the flexibility both for change and for 'multiple use of space'. This multiple use of spaces is an important aspect of flexibility, from two counts : one, it may be a space adapted for several kinds of subjects matter-a special class room for both social science and geography, a multiuse laboratory space for both chemistry, physics and biology, a multiuse workshop for both mechanical and carpentry trades or a multiuse workshop for type writing, technical drawing and electrical trades, two, it may be a multiuse room for use by community people outside of school hours. As for example, the gymnasium-auditorium may be used as indoor games, T.V. and radio room for the community people.

The outdoor spaces also can be designed for multiple uses. Exterior social courts both for male and female are to be provided between two class room wings. All the rooms, connected by corridors facing the courfts make these courts more meaningful. The doors of all the rooms open up to the corridors facing this social courts and then helped the expansion of the interior activities on to these social terraces or courts which is much expected in the school design. There are many ways to achieve these desired characteristics of a good school campus. The school designers should give

more emphasis upon volume instead of mass, they should work with space rather than rooms and with environment instead of buildings. School designers should think in terms of three dimensional spaces rather than of two dimensional areas. Finally flexibility should be the key note of our school architecture.

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