DOCUMENT RESUME

ED 023 256 EF 001 667

Buildings for Education, Vol. 1, No. 3, September 1967.
Asian Regional Inst. for School Building Research, Colombo (Ceylon).
Pub Date Sep 67
Note - 24p.
EDRS Price MF - $0.25 HC - $1.30
Descriptors - *Abstracts, Classrooms, *Environmental Research, *Foreign Countries, Laboratories, Literature Reviews, Research Reviews (Publications), *School Buildings, School Design, *Space Utilization

A quarterly review of school building research in Ceylon including a technical note on school space, and abstracts of publications concerned with educational facilities. Included are subject and author/title indexes for the abstracts. The Asian Regional Research Institute is UNESCO-sponsored and offers technical assistance to developing nations. (FO)

Asian Regional Institute for School Building Research

Sponsored by Unesco

BUILDINGS FOR EDUCATION

Vol. 1 No. 3

September 1967

COLOMBO

I. QUARTERLY REVIEW

July - September 1967

Second Meeting of the Steering Committee:

The Institute's Steering Committee met on 22nd August and approved the Work-Programme for 1968. A preliminary proposal for the 1969/70 programme was also considered and approved. The Committee comprising Mr.M.J.Perera, Director-General for Education, Ceylon, and Mr.Raja Roy Singh, Director of the Unesco Regional Office for Education in Asia, will probably meet next in February 1968 after the first meeting of the Institute's Technical Advisory Group later this year.

Unesco Staff Appointment:

Mr.C.Finney, Architect has been appointed to the Institute as a Unesco expert. Mr.Finney's duties are in connection with the formation and support of school building development groups in the Region and in this connection he will leave Colombo on August 26th with the Institute's Director to visit Iran, Afghanistan, Burma, Laos, Thailand, the Philippines, Malaysia, and Singapore.

Mr.Finney, who arrived in Colombo in July this year, has had considerable experience of school building *inter alia* in Saudi Arabia and Afghanistan.

Cost and Space Studies:

The *Report on the Design and Cost of Secondary Schools in Ceylon* has now been presented to the Minister of Education and Cultural Affairs.

Mr.Senerath (Educationist) and Mr.Sheath (Cost Expert) are currently visiting Iran, Afghanistan and India where similar studies are in progress. At the conclusion of each study a short seminar at national level is being held for those responsible for school building.

Design of Teaching Spaces for Secondary Schools:

Dr.E.Gonzales, Dean of the Faculty of Home Science in the University of the Philippines has now completed four weeks work on space requirements for teaching home science in secondary schools, as Specialist Unesco

Consultant to the Institute. During this period she has worked with the Institute's Research Architect on the design of separate and multipurpose laboratories and furniture for foods and nutrition, clothing, laundering and home nursing. The results of the study, which is related to the curricula of Unesco's Asian Member States in these subjects, will shortly be published.

Mr.J.Alles, Deputy Director-General for Education, Government of Ceylon, has been appointed as a Consultant in the design of chemistry laboratories and is currently working on the topic with the Institute's Research Architect. Mr.Sharma of N.C.E.R.T., New Delhi, has been appointed as a Unesco Consultant for the design of biology laboratories and will assume duties in the Institute shortly.

Ceylon Development Group:

The Ministry of Education and Cultural Affairs has formed a school building development group in connection with its plans to construct over 20 technical schools during the next five years. The group, in a series of meetings, during which they had the advice of the Institute's staff, has completed the first stage of its work and presented a cost and space brief to Dr.S.L.de Silva, Deputy Director-General responsible for technical education in Ceylon. It is anticipated that designs for the first prototype school will be completed and construction commenced by the end of the year.

Illumination Study:

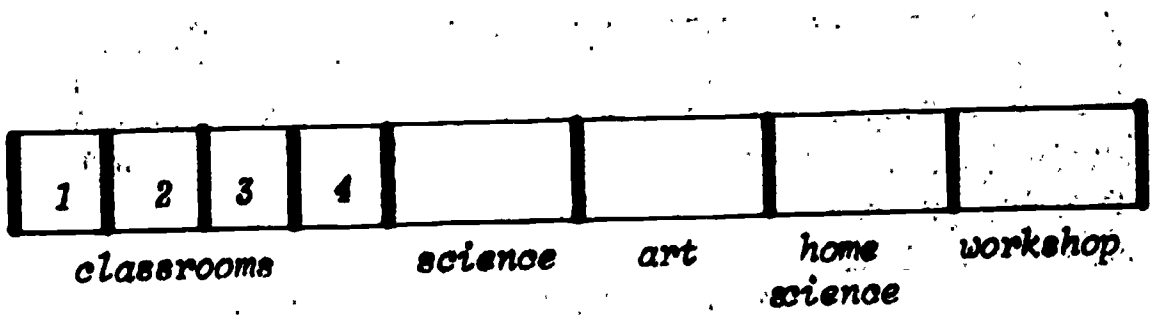
Dr.Narasimhan, Physicist and Senior Scientist at the Central Building Research Institute, Roorkee, India, returned from his mission to the region where he undertook as a Consultant to the Institute, a feasibility study in preparation for a regional study of illumination design methods for Asia's schools. This study which has been approved by the Institute's Steering Committee, will commence in 1968. It involves the collection of data by eight Asian university departments of physics, on the sky luminance and availability of daylight in the Member States. Apparatus - photo cells and micro ammeters - will be fabricated for this purpose in C.B.R.I., and sent to the measuring stations. Processing of the data as it comes in will be undertaken in C.B.R.I. from July 1968 to July 1969. The data will then be used in the manufacture and preparation of simple devices such as protractors, charts and tables, to enable school architects easily to design shaded windows to give predetermined illumination levels in teaching spaces.

II. TECHNICAL NOTES

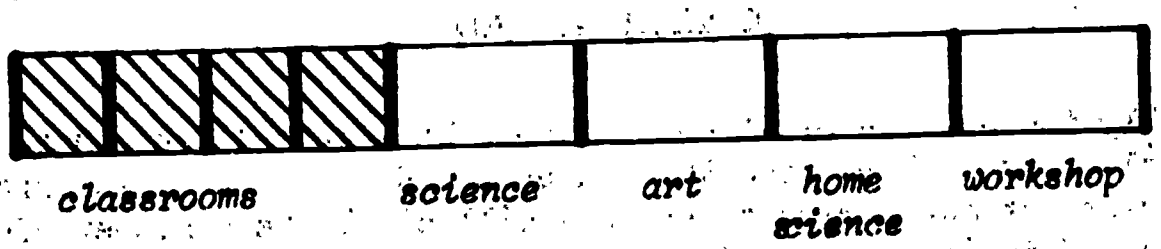
SPACE PER PLACE

Space is a pleasant commodity and the more we can have of it in schools the better; but space costs money to enclose so that the poorer a country, the more careful it must be to ensure that teaching spaces are intensively used, and that each space is as small as is compatible with the use to which it is to be put.

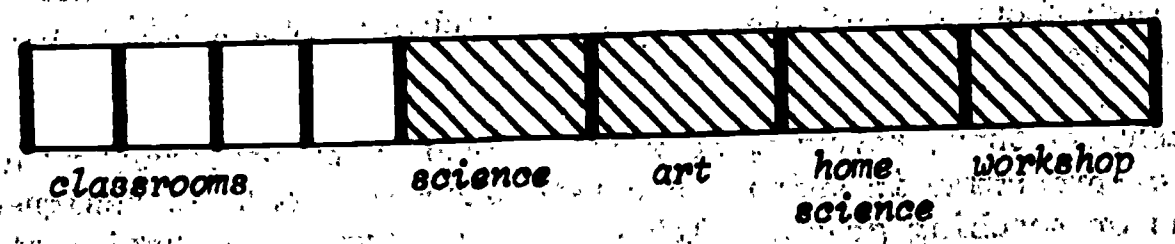
As far as the intensive use of space is concerned, very real programming problems arise in second-level education where special rooms are needed for science teaching, music, home economics, crafts and the like. A simple graphic example will illustrate the point:



THE BASIC ACCOMMODATION



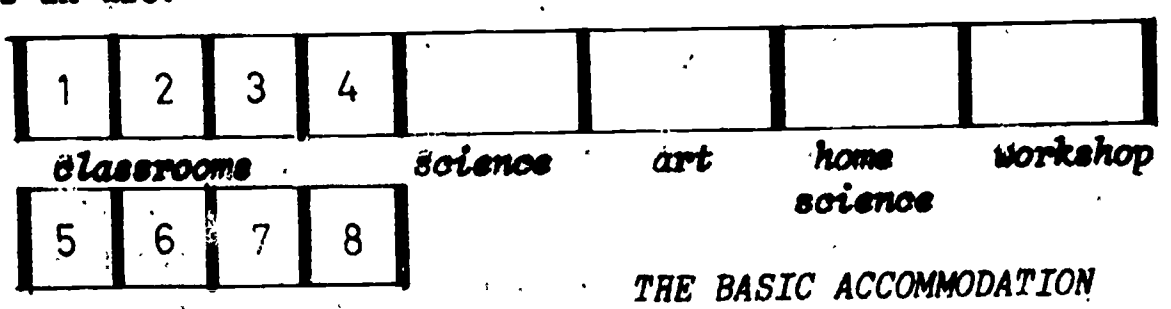
ALL CHILDREN IN CLASSROOMS - special rooms used



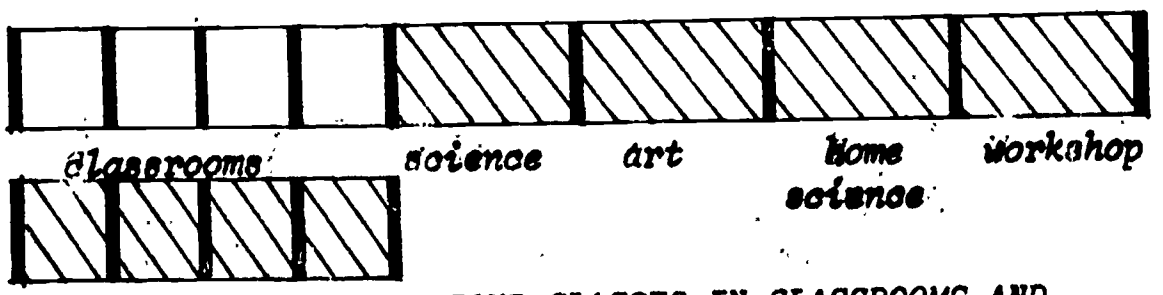
ALL CHILDREN IN SPECIAL ROOMS - classrooms unused

Fig.1: MOVEMENT OF TEACHING GROUPS AND WASTE OF SPACE.

As the population of children attending the school increases then the space per place needed, and thus the cost per place, will reduce due to more intensive use of the special rooms. In the example given above it will be seen that roughly half the space provided is in use at any one time. By adding another stream and four more classrooms it will be seen from the drawing below, that roughly two-thirds of the space provided is always in use.



THE BASIC ACCOMMODATION



FOUR CLASSES IN CLASSROOMS AND FOUR IN SPECIAL ROOMS

Fig. 2: MORE EFFECTIVE SPACE USE THROUGH INCREASING THE NUMBER OF TEACHING GROUPS.

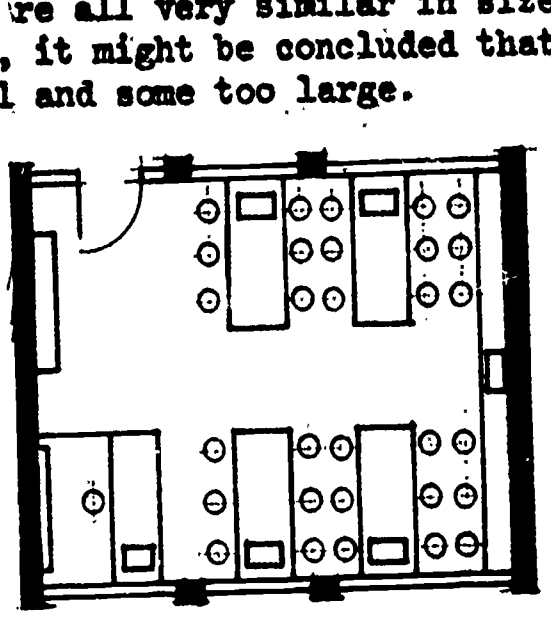
Ideally the numbers of students should be adjusted such that all of the special rooms will be used throughout the day. If this is arranged then the waste at any period of the day will simply be a number of classrooms. This is not as bad as it would at first seem for it is virtually impossible, without the aid of computors, to programme a complicated second-level curriculum in such a way that every space is simultaneously in use. A well-designed and organised school will have not more than about 80% of its available teaching accommodation occupied at any one time.

To achieve this, however, it will frequently be necessary to abandon the type of programme in which a separate base-classroom is assigned to each class or teaching group. Although a base-room is essential at primary level, it is less necessary in secondary schools. Much better use can be made of the building if classes move freely according to the dictates of the time-table, rather than if the time-table is constructed around fixed bases for each class.

Nevertheless, little will really be gained by careful time-tabling for the intensive use of teaching spaces if the spaces themselves are too large having regard to the numbers of children that are to occupy them. Wasteful design of ancillary accommodation such as toilets, library, staff rooms and corridors may also lessen the gains achieved by optimum occupancy of classrooms and special rooms.

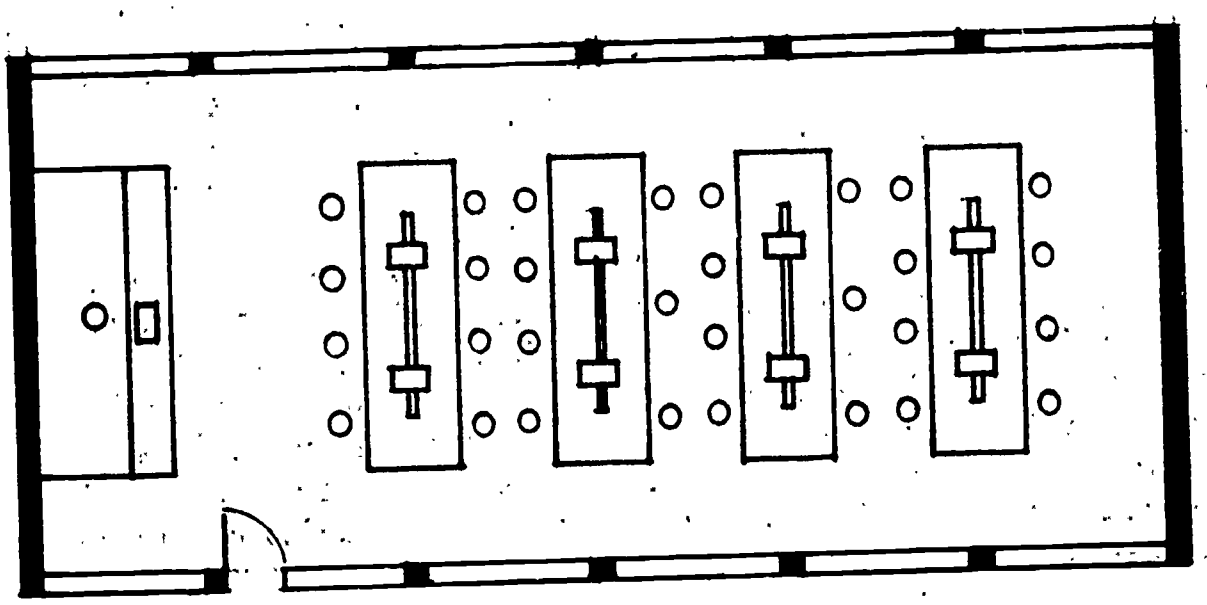
As far as the sizes of teaching spaces are concerned, study of classrooms, laboratories and the like in the various States of the Asian Region shews a far wider range of dimensions that might be imagined, even allowing for variations in teaching methods.

The comparative areas of ten similar secondary school clothing laboratories were recently listed and ranged from 18.7 sq.ft. (1.74 sq.m.) to 54.0 sq.ft. (5.02 sq.m.) per place, with a median area of 34 sq.ft. (3.16 sq.m.). As the children are all very similar in size and the activities were similar in each case, it might be concluded that some of these laboratories are too small and some too large.



2.3 sq.m. or 25 sq.ft. per place

A TYPICAL SMALLER LABORATORY HAVING 30 PLACES



4.6 sq.m. or 50 sq.ft. per place

A TYPICAL LARGER 30 - PLACE LABORATORY

Fig.3: SIMILAR LABORATORIES FOR 30 STUDENTS

Even in classrooms in the Asian Region areas per place range from 10 sq.ft. (0.93 sq.m.) per place, up to over 20 sq. ft. (1. 86 sq. m.).

Anthropometric studies shew quite clearly that a child, desk and chair, together with circulation space and an element of space for the teacher, only requires 12 sq.ft. (1.11 sq.m.) per place.

What is needed then in the region is a much more precise allocation of the areas per place for teaching accommodation. This, if achieved, will usually lead to a substantial reduction in capital expenditure.

In one Asian State where an exercise in the design of teaching spaces has recently been completed, savings of some 20% were achieved through studied reduction in sizes of classrooms, laboratories and workshops. Moreover, amenity was improved through adjustments in shape.

The second problem in designing economical schools is that of reducing ancillary accommodation to a minimum. In order of priority the following should be provided for every school:

1. Toilets)
2. Staffsroom) Essential and usable space
3. Library)

But in fact what is often provided is:

1. Verandahs)
2. Lobbies) rarely essential and in-
3. Assembly Halls) frequently used space.

In some schools, of course, all these elements are found. A first principle in design is to *provide only space for which there can be a programmed use*. It may be that, in future, when all children have a place in school, there will be a case for designing buildings with "features" such as courtyards, pools, verandahs and the like. But until every child does have a place in a school then every cent should be spent on providing teaching spaces, toilets, staff rooms and libraries.

In a few countries of the region verandahs may be needed. Thailand, for example, has schools in regularly inundated areas and verandahs are essential for play and communication between classrooms in much of Central and Southern Thailand. Ceylon has no such problems and its standard single-storey schools logically have no verandahs. Looked at from the other angle, if Ceylon had verandahs to its schools, it is unlikely that as many of its children would be receiving education as do so at present.

If a classroom is 20 ft. wide and has an 8 ft. verandah, then about 25% of the building cost is spent on virtually wasted space.

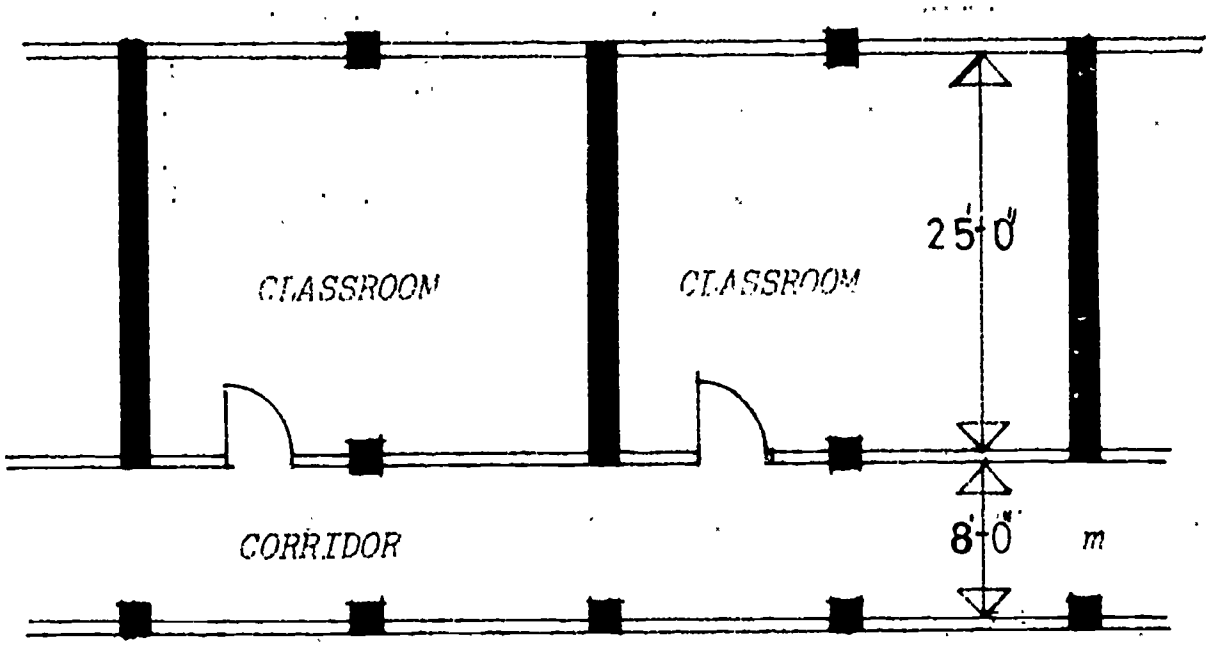


Fig. 4: SPACE WASTAGE THROUGH USE OF VERANDAH.

A primary school budget of $4 million would include a budget of $1 million for verandahs.

But what of two- or three-storey buildings? The usual design is as follows:

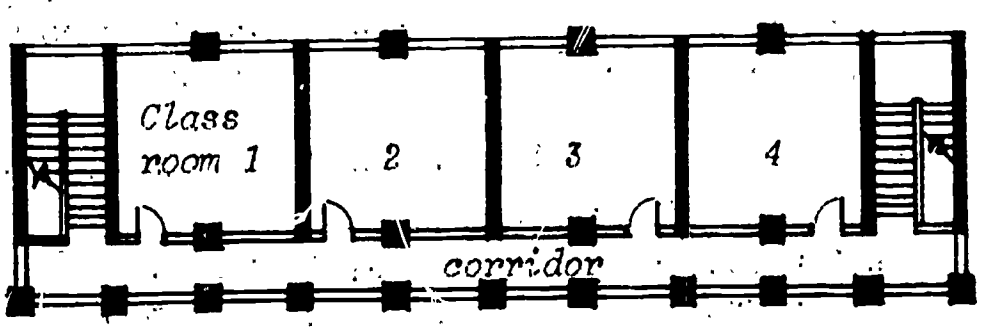


Fig. 5: WASTEFUL CIRCULATION SPACE.

The arrangement below is cheaper in first cost and in maintenance.

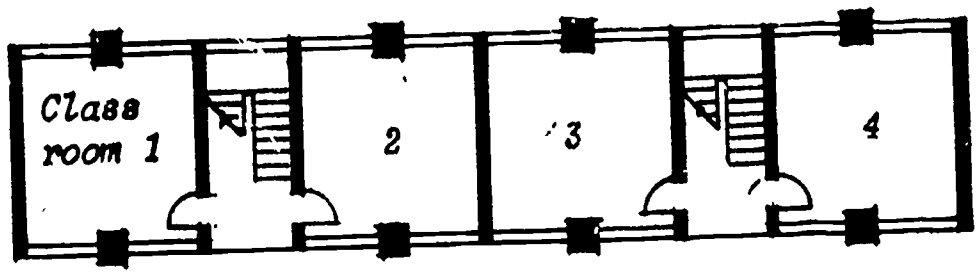


Fig.6: REDUCED CIRCULATION REDUCES COST

It may be concluded then that there are three ways to reduce the space, and thus the cost, per place:

1. By intensive use of accommodation, so that not less than 80% of teaching spaces in secondary schools are in use at any one time.
2. By design and construction of minimum sized teaching spaces.
3. By reduction of the areas of ancillary accommodation to an absolute minimum.

The last two considerations lend themselves to vigorous control by the authority responsible for school building standards through the regulation of areas for teaching spaces and of gross areas for the school as a whole.

The Asian Ministers for Education and Ministers for Economic Planning in a meeting at Bangkok in 1965, approved a document entitled *Perspectives of Education in Asia - an Asian Model* 1/ in which the gross areas per place in schools were suggested as follows:

First Level	(I-VII)	14 sq.ft.(1.3 sq.m.) per place
Second Level	(VIII-XII)	
Lower Stage General	(VIII-X)	32 sq.ft.(3.0 sq.m.) per place
Upper Stage General	(XI-XII)	32 sq.ft.(3.0 sq.m.) per place

1/ Since re-issued as: *UNESCO. An Asian model of educational development; perspectives for 1959-80.* Paris, 1966. The information appears in Table 24, p.64.

Much of the success of educational plans for Asia in the next decade will depend on carefully planned capital expenditure. The most useful way of controlling future building costs will be to design using these recommendations of space per place.

III. EDUCATIONAL BUILDING ABSTRACTS

Aa7 - EDUCATION

25. CAPITAL expansion; a primer for board members. *School Management*, v.10, no.11 (Nov) 1966, p.108-111.

Through five, easily understood formulae, Vincent K.Van Allen, an engineer, has derived a method by which a member of a school board, an Asian Minister of Education, an educationist or an architect, can check the research of his consultant into school building requirements for the future of a given area.

The formulae are, of course, only as accurate as their components, but they give answers to:

(a) the rating of a school's *classroom* space in terms of future enrollment needs;

(b) an estimate of future enrollment;

(c) finding the number of classrooms which will be needed;

(d) the number of families and students which might be involved if "re-districting" seems necessary.

The article points out the usual need for a certain amount of research into demographic areas, and the need for annual review of the results obtained from use of the formulae.

26. CASTALDI, BASIL. The Castaldi nomogram; an aid for translating the curriculum of junior and senior high schools into the necessary numbers of instructional spaces or classrooms. Cambridge, Mass., New England School Development Council, 1953. 22 p., illus. (New England School Development Council. Pamphlet, no.19).

The Castaldi nomogram provides a scientific basis for determining the necessary number of teaching stations or classrooms in a planned secondary school. Use of a very simple nomogram given in the pamphlet

Aa7 - EDUCATION (continued)

26. CASTALDI, BASIL. The Castaldi nomogram; (continued)

will enable rapid answers to be obtained to questions such as

(i) How many teaching stations would be needed to teach science to 400 pupils taking science four times a week with an average class size of 25 in a school with a programme organised on a six period day?

(ii) What fraction of the school day will a science room be used for 200 pupils taking a subject three times per week with an average class size of 30 in a school organised on a six period day?

27. UNESCO. An Asian model of educational development; perspectives for 1965-80. Paris, Unesco, 1966. 126p., tables, glossary of symbols used. Obtainable from: Unesco, Place de Fontenoy, Paris-7e, France.

"The Asian Model" as it is called, was considered and examined by The Conference of Ministers of Education and Ministers responsible for Economic Planning of Unesco Member States in Asia which was held in Bangkok in November 1965. The Model is primarily an attempt to visualize educational development in Asia until 1980 in quantitative terms. Secondly, it illustrates the interrelationship of the main factors in educational development and shows how they may be viewed in different combinations. Thirdly, it draws attention to some of the important implications for educational development that become evident when specific data are examined systematically and quantitatively. The most interesting aspect of the Model is its methodological approach which places at the disposal of the policy makers the tool for understanding the complex nature of relationships between variable affecting educational planning. However, the Model is not a substitute for educational planning but rather a tool for planners.

Ab3 - STRUCTURAL ENGINEERING

28. NEW steel framing system promises major savings in high-rise apartments. *Architectural record*, v.139, no. 7(6), (Jun) 1966, p.191-196.

Standard primary schools in Singapore have been constructed 10 storeys high. In Hongkong the standard secondary school is six storeys. Other densely populated urban cities in Asia may soon be building higher schools on smaller sites.

The new steel framing system developed at M.I.T.* uses half as much steel as a conventional rigid steel frame and 60% as much as a braced frame, without restricting planning flexibility. The key to the new framing system is a series of storey-high trusses spanning the width of the building and staggered so that whilst trusses are 24 ft. apart, floors span only 12 ft. resting on one truss below and hung from the next staggered truss above.

Of importance to those designing in tropical zones is the possibility of unobstructed ventilation as the trusses run across the building.

Ab9 - PROTECTION, PROOFING, INSULATION

29. DREYFUS, JACQUES. Le confort dans l'habitat en pays tropical; la protection des constructions contre la chaleur, problèmes de ventilation. Paris, Editions Eyrolles, 1960. 363p., illus; diagrs. (sun diagrams in back pocket), bibl.

This is one of the very few books dealing with thermal comfort in the tropics. It is based fundamentally on the effective temperature concept and makes no reference to the work of Webb and the Equatorial Comfort Index.

As far as the sections on construction are concerned they deal most thoroughly with methods of thermal transmission, with sun and shade and with ventilation. Buildings suitable for various types of climate are discussed in relation to the earlier

---

* *Massachusetts Institute of Technology, Department of Architecture and Civil Engineering.*

Ab9 - PROTECTION, PROOFING, INSULATION (continued)

29. DREYFUS, JACQUES. Le confort dans l'habitat en pays tropical; (continued)

theoretical chapters and there is a chapter on air-conditioning. The author draws most of his examples from Africa - but of course many of the conclusions are valid for Asia and similar climates in other parts of the world. The book contains useful loose cards of sun shading diagrams.

Ba6 - BUILDING PRODUCTION, SYSTEMS, ETC.

30. INDUSTRIALISATION of school building. *International school building news*, [v] 2, no.3/4 (Nov) 1966, special edition. Obtainable from: Bouwcentrum, Weena 700, P.O.Box 299, Rotterdam, Holland.

This report presents strong arguments for the industrialisation (or prefabrication) of school building components with a view to reducing overall costs by saving on site labour, and through mass production while, at the same time, allowing flexibility in planning and design by the architect.

The narrative goes into some detail on the objectives of industrialisation (building in quantity), usual materials of construction, modular planning and the importance of collaboration and is followed by a number of illustrations of well-tried structural systems.

This is perhaps the first time these school construction systems have been assembled within one document. For reference, they consist of: CLASP, UNISTRUT, SCSD, MUWI, LAGE LADEN, HUMBURG, FYN, DERWENT, MEXICO, VARIEL and M.I.T. systems.

This special edition of *International school building news* is the full text of a report under Mr. Pal Stipkovits of Bouwcentrum, from the School Building Section of the Conference on the Industrialisation of Building held by the International Union of Architects in 1966.

(26) - ROOFS

31. KOENIGSBERGER, OTTO *and* LYNN, ROBERT. Roofs in the warm humid tropics. London, Lund Humphries, 1965. (Architectural Association. Paper, no.1) 56p., illus., tables, maps, bibliog.

As far as thermal comfort is concerned the most important element in housing and school building in the tropics is the roof. The use of traditional materials such as reeds, palm leaves and straw is rapidly dying out in many Asian countries - especially in urban and semi-urban areas. New roof materials such as asbestos sheet, aluminium sheet, tiles and reinforced concrete are now finding increasing use. The problem which this publication considers is that of the value of the new roofing materials in relation to thermal comfort. The publication is in the form of a survey of the available information on roof or ceiling finishes using these new materials and climatic performance standards are suggested. Some different combinations of roof and ceiling materials are analysed with reference to these performance standards and the costs of roofs satisfying the performance standards are compared.

(4) - FINISHES

32. PARKER, T.W. Modern surface finishes. *Building materials*, v.26, no.1 (Jan) 1966, p.17-20.

A table in this article analyses the percentage of annual maintenance expenditure on schools as follows:

Structure	12%
Partition	4%
Decoration	52%
Fittings	3%
Services	25%
Other	4%

The trend in surface finishes is now towards off-site manufacture of units which are as nearly as possible self-finished. Examples of these are the various large

(4) - FINISHES (continued)

32. PARKER, T.W. Modern surface finishes. (continued)

concrete panels systems installed with a suitable external finish and filling panels finish as interior lining. Costs using these new finishes are tending to reduce. The article discusses calculations of cost-in-use with particular reference to redecoration. Cost is of course not the only criterion in selecting a finish; amenity is also important. In view of the very high proportion of maintenance spent on decoration, more attention should be paid at the design stage to the problem of producing durable finishes.

(87) - SPACES & FIXTURES FOR EDUCATIONAL BUILDINGS

33. DE LA SERNA, LEONORE LOW. Structuring classrooms for effective learning. *Philippine journal of educatior.*, v.45, no.8 (Feb) 1967, p.591-2 and 626-7.

This article is written by a school district supervisor for teachers who are either having a classroom built or taking over an existing room. The writer points out that with modern teaching, the classroom has moved beyond the stage of being a mere "hearing" room where desk and blackboard only were required and has become a learning laboratory, where furniture should be arranged for active learning. She mentions the variety of equipment that modern teaching methods require - pictures, charts, maps, models, specimens, among others - and the consequent need to provide storage and display space for this equipment.

The sizes of children need to be taken into account when furniture and its arrangements are considered. Where a teacher takes over an existing room, the lighting of the room should be carefully studied to provide the best visual comfort for pupils, avoiding contrasts of darkness/brightness and glare. Colours are suggested to counteract a cheerless room. The writer gives a list of basic furniture and suggests it be arranged in "units" around activity areas.

(87) - SPACES & FIXTURES FOR EDUCATIONAL BUILDINGS (continued)

33. DE LA SERNA, LEONORE LOW. Structuring classrooms for effective learning. (continued)

Materials for decoration of the classroom, to give it a lived-in, "personalized" appearance are also suggested.

Also mentioned is the need to maintain the classroom, and above all to keep it clean. The writer indicates that it is necessary to tackle this in a systematic way, dividing the work between pupils and teachers. This seems to be a pattern throughout many Asian schools, where regular outside cleaning service is not provided. However this supervisor takes care to point out, that if willing assistance is required of children of all ages, it is fairer to allow the children to do the more attractive tasks and not to expect them to do the heavy work of scrubbing or moving furniture. Neither should cleaning be given as a punishment.

Finally, the teacher is advised to thoughtfully analyse the activities going on throughout the school day and plan the room accordingly.

34. SAVAGE, Sir GRAHAM. The planning and equipment of school science blocks. London, Murray, 1965. 78p., illus.

Although this book deals with the design of laboratories in the United Kingdom it contains a great deal of very useful information which is of universal application. It develops ideas on the size of science rooms having regard to various types of curricula and also deals at length with the layout of laboratories for various purposes. One of the advantages of the many drawings provided is that for each type of laboratory several alternative arrangements of furniture are given. These drawings are all dimensioned. The sections on furniture provide many ideas which would be of use in Asia, but the dimensions would need to be adjusted in relation to the size of Asian children. As a very rough guide a ten percent reduction would be appropriate.

(95) - RECREATIONAL BUILDINGS

35. SPORTS buildings for the University of Hull: architect, Peter Womersley. *Architectural review*, v.138, no.821 (Jul) 1965, p.30-34.

A major problem in the provision of covered facilities for sports is the arrangement of space suitable for a multiplicity of games.

The sports building for the University of Hull is a good example of a building in which, through the use of a system of floor-to-ceiling netting in different combinations, many sporting activities can be carried simultaneously.

The building comprises two blocks connected by a simple bridge. The larger block houses a 7,200 sq.ft. multipurpose hall and two gymnasia whilst the smaller block contains two squash courts. The access space to the gymnasia overlooks and forms a gallery to the multipurpose hall. There is thus virtually no space wasted in circulation corridors and indeed the entire building represents a most economical solution to a difficult spatial problem.

(97) - EDUCATIONAL BUILDINGS

36. *db; deutsche Bauzeitung*, v.100, no.9 (Sept) 1966.

This issue of "db" is of special interest even though it is devoted chiefly to school buildings in Europe and America. The issue is extremely well illustrated with photographs and drawings of school building plans.

The American schools illustrated provide excellent examples of very tight planning and minimum circulation space. Many of the ideas are relevant to schools from a range of areas from the hot, dry to the cold, hilly, type. The magazine also contains a good selection of tightly planned British schools and of

(97) - EDUCATIONAL BUILDINGS (continued)

36. *db; deutsche Bauzeitung,* v.100, no.9 (Sept) 1966. (continued)

course there is shown a wide range of modern German school buildings. Many of these are of considerable interest as they are designed using the finger-type plan commonly utilized in hot humid areas of Asia.

37. ECOLES, universitaires. *L'architecture d'aujourd'hui.* 36e ann., no.123 (dec/jan) 1965/66.

This issue is devoted to a series of brief studies of schools and universities in various parts of the world. It is of interest to Asian readers as schools from the tropics and sub-tropics include examples from Portugal, Mexico, the Cameroons, Rabat, California and Brazil. The article analyses some of the problems associated with school design in France and describes the intensely traditional attitudes of those charged with the education of young children. It suggests that some of the problems may be remedied by the work of groups comprising educationists, architects, technicians, and administrators. These groups may produce new ideas. The schools and universities described are illustrated by photographs and drawings. It is unfortunate that very few of the photographs include human figures. This makes it very difficult to assess the scale of some of the buildings illustrated.

38. ELLSWORTH, RALPH E. *and* WAGNER, HOBART D. The school library. Edited by Ruth Weinstock. New York, Educational Facilities Laboratories, 1965. p.142., illus., bibl. *Obtainable free from:* Educational Facilities Laboratories, 477 Madison Avenue New York 22, N.Y.

The rôle of the school library in America is rapidly changing from that of a repository for books to a teaching laboratory with individual study space. This is well illustrated

(97) - EDUCATIONAL BUILDINGS (continued)

38. ELLSWORTH, RALPH E. and WAGNER, HOBART D. The school library. (continued)

by this book which discusses the anatomy of a modern school library, as well as its physical contents and layout. The book contains attractive drawings of shelving, study carrels, and group teaching and study spaces. The location of the library in relation to other units of teaching accommodation is also described and the concluding chapter contains a number of case studies of libraries in modern American schools.

39. McCLURKIN, W.D. School building planning. New York, Macmillan, 1964. 143p., bibliog.

This book has been written with the object of strengthening sound judgment when decisions on school buildings are to be made by educationists. It deals with educational planning processes but its most interesting sections for architects are those dealing with fact or fantasy in relation to school building design. In these sections the question of class areas, classrooms spaces, building shapes, storeyed buildings, single and double corridors, and lighting, are considered. The author stresses the need for objective evidence before taking decisions on these matters. He points out that classroom and building shapes are as much a matter of fad as a response to any educational situation. The sections on multi-storeyed buildings is interesting in view of the trend already evident in Asia towards this type of building for schools.

The advantage of the book is that it enables those concerned with providing educational buildings to discriminate between change and progress in building design.

(98) - RESIDENTIAL BUILDINGS

40. CONSERVATIVE design for New England campus. *Architectural record*, v.140, no.3(9), (Sept) 1966, p.196-203.

One of the main problems facing those responsible for new universities in Asia is that of providing residential accommodation for students.

The design for student housing in the New England campus will be of special interest in this connection for although these four-storied units have been furnished in a way that few Asian countries could afford, the planning of units is economical. With tiered bunks in student bedrooms it would be possible to double the accommodation provided.

The design is also of interest in respect of its dining facilities which are tightly planned. The entire scheme is notable for the non-institutional atmosphere that has been created. This atmosphere is helped by careful retention of existing trees.

SUBJECT INDEX

Note: Numbers refer to abstracts

AUTHOR/TITLE INDEX

Note: Numbers refer to abstracts

THE INSTITUTE'S PUBLICATIONS

Occasional Papers - School Building:
(English editions of No.1 & 2 out of print, French editions still available)

No. 1 - Climate and school building design in Java.
(English and French editions)

No. 2 - The shading of school buildings in South-East Asia; sun shading diagrams.
(English and French editions)

No. 3 - Comparative anthropometric data: A - for use in Indian schools.

No. 4 - Comparative anthropometric data: B - for use in Thai schools.

No. 5 - Comparative anthropometric data: C - for use in Indonesian schools.

No. 6 - Comparative anthropometric data: D - application of data.

No. 7 - A comparative study of multi-purpose rooms in educational buildings.

No. 8 - Comparative anthropometric data: E - for use in Philippine schools.

No. 9 - Environmental control in school buildings through planting.

No.10 - Primary school buildings in Asia: administration facilities and programmes.

No.11 - School building development group work.

No.12 - A primary school design workbook for humid Asia.

No.13 - In preparation:

A Method of Reducing Classroom Requirements in Primary Schools in Asia.

Comparative Anthropometrics for East Pakistan.

Buildings for Education, v.1, no.1,& 2.

These publications are obtainable free on application to

The Documentalist
ARISBR
P.O.Box 1368
Race-course COLOMBO 7
Ceylon