NTS & NEEDS OF THE
ED LEARNING ACTIVITIES
RY TEACHERS TRAINING

sation, Space Adequacy and Space
nce to the Primary Education

Demonstrating/
performing

Exhibiting/
displaying

BAR 501 - THESIS

Investigation Report - 1991/92

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This investigation report is my original work and has not been presented in this University or any other University for award of a degree.

Signed: .....

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This investigation report is submitted as part of the requirements of Bachelor of Architecture of the University of Nairobi.

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° Gratitude to the tutor/advisor for constructive criticism, advice and encouragemnt.

° Thanks to Mr. Peter Kuria (Programmes Co-ordinator, Primary Education Division, Kenya Institute of Education) for guidance during the identification and delineation of the scope of the problem.

° College Principles and Deans of Curriculum in Highridge and Thogoto Teachers' College.

° The Research Typist Miss Anne Agini.

° All well-wishers.

Space, being the medium through which activities are realized, may be studied under nemerous parameters. One may study structure in space, lighting in space, ventilation in space, acoustics in space etc. To enhance the objectivity of this research, the investigation report is based on "space organisation", "space adequacy" and "space morphology". These are studied under the common denominator - performance.

Space is the main item with its constituents limited to "users" and "elements". The users here are the source (tutor) and recipient (student). The elements, on the other hand, may either be space defining cum service elements (passive) e.g. cabinets and worktops, or space defining elements "per se" (active) e.g. walls and infrastructure.. Other aspects may be mentioned only to explain or highlight these issues.

This investigation report draws a lot of its information from the Kenyan Primary Education Curricula.. after 1979 and leaves the programming to the administration. Programming or timetabling of space utilization is in itself administrative and thus away from the focus of this study.

As will be seen in the comparative analysis of subjects in Kenyan Primary Teachers' Training College

before and after 1979, the practical oriented learning activities referred to here are those of Science, Arts and Crafts.

The study is divided into three main parts:-

PART 1:-

Identifies, states and defines the criteria, highlighting the strong and weak points associated with the housing of practical oriented learning activities in Kenya today.

PART 2:-

Tests the criteria on established learning environments for primary teachers in two different situations.

a) On a tight site i.e. representative of the urban environment. Higridge Primary Teachers Training College - Nairobi, - is good example.

b) On a spaceous site i.e. representative of the rural environment. Thogoto Primary Teachers Training College - Kikuyu, - is a good example.

PART 3:-

Recommendations and Conclusions!

Comments, Recommends of Concludes.

This consists of three main parts:-

i) The subjects of investigation

ii) The instruments or objects of investigation

iii) The procedure of investigation.

SUBJECTS OF INVESTIGATION

These are the space variables and constitute "the users" and "the space defining elements". The study of the "users" is concerned with the "user characteristics" and "user needs" while that of the "elements" is concerned with "space characteristics" and "space needs,"

INSTRUMENTS OR OBJECTS OF INVESTIGATION

To collect and document the necessary information, certain items are handy. In this case the items include camera, a tape measure and acquired drawings.

PROCEDURE OF INVESTIGATION

First the "user characteristics" are established as:-

1) Statements of the various subject area activities from the Primary Teachers' Training

Colleges' Syllabuses of 1986 -(the latest so far).

2) Statements of the corresponding material provisions to the subject area activities from the College being studied (backed by photographs, sketches, illustrations and other data.

The "user needs" are established by direct or trace observation of the utilization patterns, backed by photographs and sketches.

Secondly, the "space characteristics" are established as statements and/or illustrations of the space provisions to the activities, as they are, in terms of organisation, adequacy and morphology.

"Space needs" are evoked from the "user needs" and thus user performance. "Space needs" are established through the critical assessment of "space organisation", "space adequacy" and "space morphology" by the common parameter - performance.

Performance here is concerned with:-

a) Critical reaching distances, heights and area.

b) Critical circulation clearances between work places.

c) Critical scale and proportions.

d) Critical visual communication space needs.

e) Crtical audio-communication space needs.

f) Safety and security space needs.

All these are assessed with the aid of;-

a) Direct observation, backed by photographs, sketches, tables, charts, graphs, illustrations and figures.

b) Trace observation backed by photographs and sketches.

c) A combination of (a) and (b).

1. To try and identify, state and define the nature of activities resulting from the inclusion of practical oriented learning in Primary Teachers' Colleges in Kenya. These can be evoked from the current user characteristics and user needs.

2. To try and establish the appropriate space organisation type(s), adequacy and morphology types that enhance these activities i.e. the space characteristics and space needs corresponding to the current user characteristics and user needs.

3. To try and establish the "Link", the kind(s) of spaces that unify and enhance a sense of community and inter-personal interactions ~~and enhance a sense of community and inter-personal interactions~~.

4. To help in generating the brief for the practical learning activities in Primary Teachers' Training, Colleges in Kenya today.

A longside the current need for self employment grows the need for technical training. It is now clear that technical education has been stretched back into primary education. Formerly this was left for secondary education - meaning that primary education was a preparation for secondary education rather than a possible terminous to education.

In April, 1979, the first draft of the Primary Education Project (P.E.P.) was released only to be revised in October, 1982. Some of the background information in the revised edition is as follows:-

> "The current primary education does not cater sufficiently for the majority of our children for whom primary education is terminal. Rather it caters more for the minority, who manage to continue with their education to secondary and thus there is a rising rate of un-employment among primary school leavers."

"It is thus recommended that :

1. The quality, content and relevance of the seven year primary education should be improved so that it caters equally for the majority of children for whom primary education is terminal.

2. The seven year primary education should be made available to all primary school age children.

3. Primary education should be broadly based leading to competence in a variety of development tasks.

The objective of the project (Primary Education Project - P.E.P), therefore is to design, develop and implement new Primary School and Primary Teacher Education curricula to bring about the changes referred to above

This marked the beginning of the eight year primary education programme - the 8-4-4 where pupils had to learn practical work and be taught by teachers trained through practical work.

The inclusion of practical oriented learning activities had far reaching effects in the already established colleges, Highridge, for instance, is trying hard to accommodate the practical oriented learning activities within its compact framework. It is thus not suprising to find that in most, if not all the fifteen established primary teachers training colleges, quiet academic sessions are carried on in rooms adjacent to the noise of metal work and carpentry, the smell of cooking or the strains of music practice. This denies the different activities their functional autonomy, visual autonomy, and probably the architectural expression of their individual character.

As regards this inadequacy and inaapropriateness there are plans by the Ministry of Education to rehabilitate the already existing fifteen Primary Teachers' Training Colleges and built nine more appropriate Colleges relevant to the current needs.

CHAPTER 1

RATIVE ANALYSIS OF SUBJECTS IN KENYAN RY TEACHERS' TRAINING COLLEGES

After the Primary Education Project (P.E.P - 1979)

SOURCE OF INFORMATION

Primary Teachers' Training College Syllabuses of August 1972 and March 1986, by the Kenya Institute of Education, Nairobi (1986 Draft Syllabus is the latest so far).

L	SPACE TYPES USED	TIME ALLOCATION % OF WHOLE
	Ordinary classroom	33⅓%
	"	
	"	12%
l	"	16%
	"	8%
-	———	———
	Ordinary classroom	13%
	"	
	"	6%
	———	———
g	———	———
g		
on	———	———
n		
on	———	———
on	External Spaces	≃6%
on		
e	External spaces	≃6%

I — 1972

In order to identify the subjects responsible for the inclusion of practical oriented learning activities, it is logical to make a comparison between the subejcts stated in the Primary Teachers' Education Syllabuses well before the influence of the Project.

Table I shows the subjects stated, the practical aspects of the subjects, the teaching space types used, and the time allocation by 1972 - seven years before the Primary Education Project was launched.

Apart from some occasional plays and drama the teaching of core subjects, languages and the social studies was based on academic content rather than the methodological approach. The formal, ordinary classroom was thus appropriate and probably adequate by 1972. Sciences, Art and Crafts had not yet been introduced and the teaching of Music and Physical Education depe-nded on the administrative policy for its nature and time allocation. The aspects familiar or convenient to the tutors were taught and others ignored. The external spaces seemed to have been adequate despite the occasional needs for an internal environment during the rainy seasons.

	SPACE TYPES USED	TIME ALLOCATION % OF WHOLE
ve n	Ordinary classroom	10%
	"	6%
	"	8%
	"	8%
	"	8%
	?	
e	Ordinary classroom	8%
	"	
	"	6%
	Ordinary classroom or converted room	8%
g	"	6%
n	"	6%
	Converted or selected classroom	8%
n	"	6%
n		
e	"	6%

II—1986

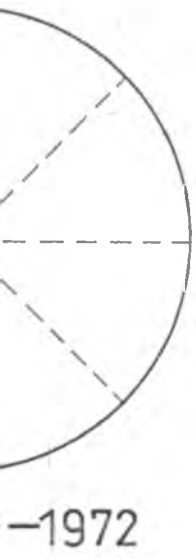
Table II shows the subjects stated, the practical aspects of the subjects, the teaching space types used, and the time allocation by 1986 - seven years after launching of the Primary Education Project.

Here the teaching of core subjects, Languages and the social studies is based in the methodological approach rather than the academic content. This is evident in the rising need for demonstrative or illustrative expression e.g. through frequent plays and drama. Though the ordinary classroom is sufficient for the formal learning activities, the group activities are best catered for in general or multi-purpose spaces i.e. Lecture Halls and Multi-purpose or Assembly Halls.

Along with the inclusion of General Science, Agriculture and Home Science, came the practical oriented needs for testing, verifying, making, demonstrating and exhibiting. These are stated in the syllabus and allocated for in time. However, the suitability and appropriateness of the space types used is questionable.

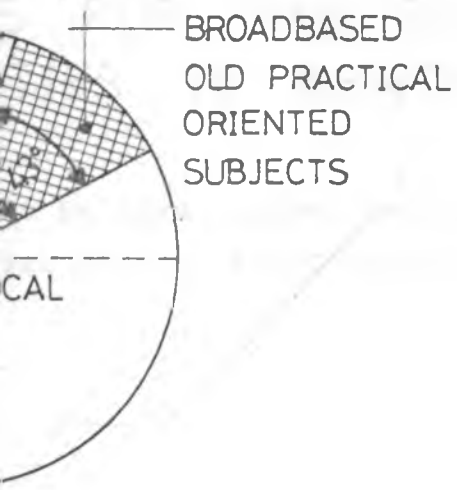
Coming to the Arts and Crafts side, the Primary Education Project (P.E.P.) has broadbased the teaching of Music and Physical Education and introduced Art and Craft to the Primary Teachers' Education curriculum. It is no doubt that the ordinary classroom inappropriate and inadequate for the resultant activities

and the mere selection of a room, based on proximity or size, is not just. Indoor music and Physical Education activities, for example, call for the use of a controlled internal environment and ample external space.



—1972

1/8 of the total time was (by 1972) allocated to the old practical oriented activities of Music and Physical Education. The nature of the actual activities and their time allocation in the Colleges, never-the-less, lay at the mercy of the administration. See Chart (a) - 1972.



—1986

By 1986, 2/5 or approximately 1/2 of the total time was allocated to the practical oriented learning subjects i.e. Arts and Crafts and Sciences. Art and Crafts were newly included while the old, Music and Physical Education were broad based. See Chart (b) - 1986.

The new inclusions and broad-basement seem to have a direct effect on the time allocation. It is thus logical to suggest the broadbasing of the Primary Teachers' Education programme to three years rather than the current two years (to match broad-basement of activities and space).

CHAPTER

EF HISTORICAL DEVELOPMENT OF THE S FOR PRACTICAL ORIENTED LEARNING TIES IN KENYA.

at Science Places, Arts and Crafts' Places During Pre-
ial Period, the Colonial Period and the Post-Colonial

To understand the user characteristics and user needs it is important to know the trend(s) in the development of the user's practical learning environment with time.

Three distinct periods can be identified:-

i) The Pre-colonial period;

ii) The Colonial period;

iii) The Post-colonial period.

Four main stages of development can be identified:-

a) Craftmanship : Learner, acquires practical skills through actual participation in a job with a skilled crafsman. The space provision for learning is the actual site or venue.

b) Apprenticeship : Learner acquires practical skills through serving a skilled master. Space provision is the master's house or sheds.

c) Academy : Learner and skilled master relate with the intention of transfer and acquisition of sills. Emphasis is

laid on the build-up of factual knowledge rather than the actual application. Space provision is the formal and usually four-sided room with minimal or no furniture movement.

d) College/ University : Master/learner interations in the transfer and acquisition of skills are based on the actual application of the skills. A market situation is created.
Space provisions are formal and informal zones of activity according to need.

2.10 : SCIENCES

2.11 : GENERAL SCIENCE

Table 2.11 shows the general drift from the pre-colonial learning by experience to a period of specialized study. Except the research institutions, learning institutions seem to be devorcing the actual site of performance from its corresponding learning spaces. This presents the danger of the child's teacher attempting to pump factual knowledge into the child rather than expose the child to the various real life experiences that may clarify the knowledge. Revi-talization of external spaces (formerly the actual site for both formal and informal learning, should be considered.

2.12 : AGRICULTURE (APPLIED SCIENCE)

The traditional, pre-colonial, co-operative apprenticeship, was distorted by the colonial oppressive apprenticeship. The learner provided the cheap labour while the initiating facilities i.e. for testing, making demonstrating, and exhibiting facilities we limited to the colonial master(s) only.

The oppressive apprenticehsip of the colonial period left to the post-colonial period negative attitudes

toward labour intensive Agricultural work. Instead a bias for facilities for testing verifying, making and demonstrating at experimental level developed. "The child's teacher" unlike the colonial master, should be able to facilitate testing, making, demonstrating and exhibiting at the formal experimental level and at the informal experimental level and at the informal, actual site situation.

2.13 : HOME SCIENCE

Whatever the culture, the teaching of Home Science entails demonstration to the learner, participation by the learner and exhibition/presentation to users/examiners Apprenticeship during the pre-colonial and colonial periods made use of the actual venues - the users being from one cultural or racial background. Learning materials could thus be specifically prepared.

The post-colonial period is faced with a market situation of various cultures and races/. It is not economical to cater for the various learning materials and their corresponding space types individually; but it is wise to cater for the aspects common and standard to the different cultures and provide for the specific variety of the different cultures.

2.20 : ARTS AND CRAFTS

2.21 : ART AND CRAFTS

Across the three periods of development, craftmanship seems to persist. For any learner, the actual making and drawing of items is mandatory. The Artroom came into the Art scene in Kenya during the colonial era. Though the Artroom may be sufficient, for "the child's teacher" the external spaces that contribute to the making of Artwork must not be ignored.

2.22 : MUSIC (PERFORMING ART)

Craftmanship in Music has also been persistent. The need to learn by observation and participation has not found its substitute. For the child's teacher the informal group activities are crucial.

2.23 : PHYSICAL EDUCATION (PERFOMING ART)

The external spaces are common to all the three periods. External spaces are mandatory to Physical Education activities.

CHAPTER

REQUIREMENTS & NEEDS GENERALLY
TED & RECOMMENDED FOR THE
ICAL ORIENTED LEARNING ACTIVITIES.

anisation Requirements and Needs, Space Adequacy Requirements and
ce Morphology Requirements and Needs

General space requirements and needs are normally derived from different specific situations. From the general requirements and needs it is possible to converge to the specific requirements and needs.

Data books give the general space requirements and needs while specific studies ("Case Studies") evoke the specific space requirements and needs.

For objectivity, the requirements and needs are stated and illustrated under the following space characteristics:

a) Space organisation;

b) Space adequacy;

c) Space morphology.

Sub-topic 3.10 -- states and illustrates the requirements and needs for the spaces for practical oriented learning within the context of the overall institutional layout.

Sub-topic 3.20 - states and illustrates the individual, subject area requirements and needs.

3.20 : SUBJECT AREA SPACE REQUIREMENTS AND NEEDS

The individual workspaces are studied, starting with those of Science then Arts and Crafts.

3.21 : GENERAL SCIENCE AND AGRICULTURE

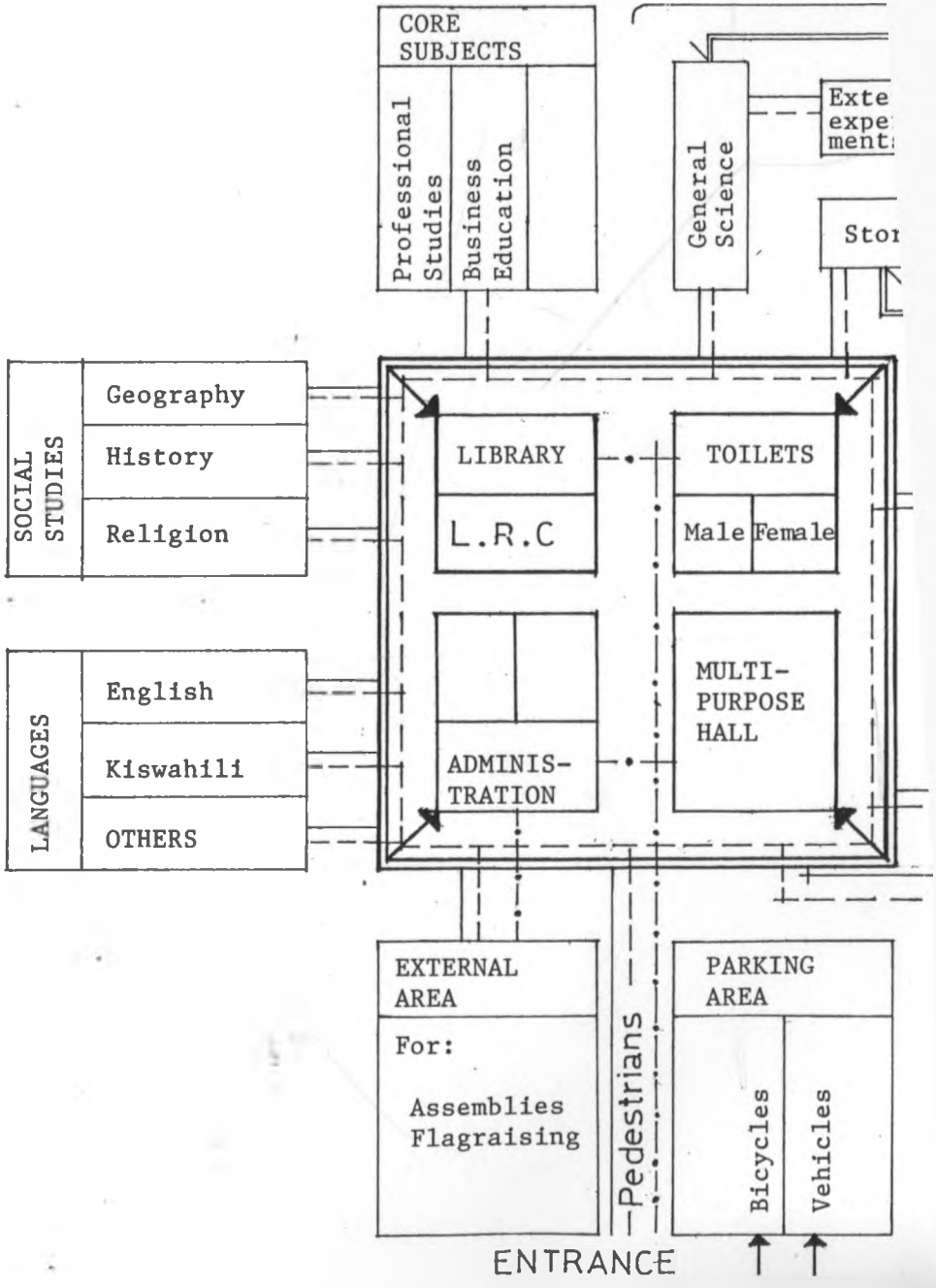
The space requirements and needs of these are mainly laboratory based.

(a_1) SPACE ORGANISATION REQUIREMENTS

The utility pattern determines the form of organisation to be adopted. For instance, in plate 3.21(a), the distribution and storage of apparatus, equipment and furniture is convenient for a personalized laboratory situation where the users are a single group. In plate 3.21(b) the distribution and storage of apparatus, equipment and furniture is convenient for a communally used laboratory i.e. involving more than a single group of users. The centralized form of organisation - plate 3.21(b) is preferred for efficient management and access in communal laboratories.

In cases where two or more laboratories share storage facilities and equipment, it is economical and convenient to centralize the storage and preparation areas. Plate 3.21(c) is illustrative to this.

PRACTIC



LEGEND:

———— °Students

— — — Teachers

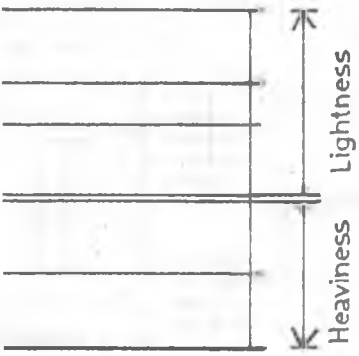
—·—·— °Guests & Community

input / output °Services

L.R.C . °Learning Resource Centre

SOURCE:

[(4), pp 57]



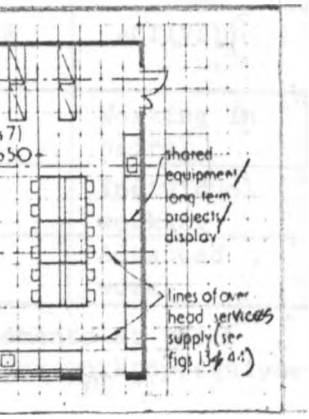
Depending on the frequency of use and weight of objects in the laboratory space, the diffent object types are zoned according to convenience and accessibility.

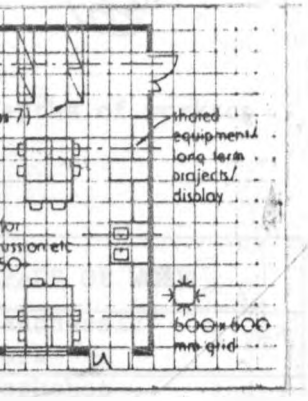
Figure 3.21 (b) illustrates the vertical storage zones based on the common patterns of use.

Zone (a) is convenient for light objects infrequently used. This is an extreme high zone of storage and thus tends to be used for dead storage.

Zone (b) is convenient for light objects frequently used, Zone(c) for light and medium weight objects frequently used, and Zone (d) for light and medium weight objects frequently used.

Zone (e) is convenient for heavy object infrequently used. This is an extreme low zone of storage and thus tends to be used for dead storage.





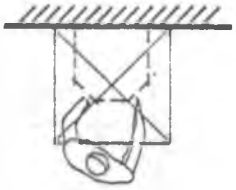
(a_2) : SPACE ORGANISATION NEEDS

The use of laboratory spaces by different classes of differing grouping patterns presents the need for a variety of alternative layouts. For example, Plate 3.21 (e) gives a teaching laboratory layout with linear bench arrangements accommodating 36 users. The group size consists of 12 users with the work places centralized and the service facilities limited to the periphery. In Plate 3.21 (f) the same number of users are accommodated at short peninsular and island benching. The group size consists of 6 users with the central area reserved for demonstrations and discussions. Service facilities, however, remain limited to the periphery.

R	ACTIVITY
	Working in pairs
	Individual working
	Advanced work

ements at the
for worktop/equipment

)



epths of worktop

PACE OF WORK	
anchscale ork	3.2m²
orkshop-cale	4.6m²

ents based on the le of work.

(b) : SPACE ADEQUACY REQUIREMENTS

For space to serve its purpose, certain dimensions are critical. Reaching distances, heights, areas, circulation clearances and scale need to be considered.

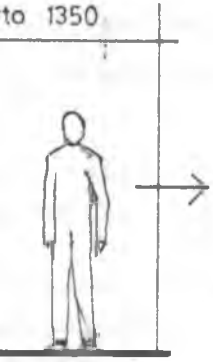
As shown in Table 3.21 (g), certain worktop lengths/person are recommended for different situations i.e. according to the nature of work and grouping pattern. These, however, are related primarily to the linear worktop layouts and may only be adapted to other kinds of layout e.g. short peninsula, island layout, or workbays.

The worktop depth should be based on the maximum convenient reach. Most requirements will be met by a 600mm depth though in some cases 700, 750 or even 900mm will be needed for large bench mounted instruments. See figures 3.21 (h). Generally, too deep a worktop will harbour dead storage at its back, making access to service controls difficult.

(6), pp. 276)

Based on common patterns of use, certain area requirements are suitable for certain levels and scales of work work. Figure 3.21 (l) shows the area requirements per place based on the level and scale of work.

(6), pp. 274).



n)
er plus
e way

s back to
s passage

For safety and convenience and safety, circulation clearances ought to be observed. The clearances vary according to the nature of traffic and the volume of traffic involved.

Figures 3.21 (m) and 3.21 (n) give the general clearances for a single worker, with and without a passage way. The clearances are with reference to neighbouring equipment or furniture.

Figure 3.21 (o) and 3.21 (p) give the general clearances for two users back to back, with and without a passageway. Thus the worktop to worktop clearance is considered.

For entry, doors should be 1.5 or 2.0 - leaf to cater for possible furniture movement or items wider than the normal single leaf door opening. An alternative way out of the laboratory should be provided for emergency purposes (1.5 to 2.0 leaf).

t of vertical work

ht of services
rols

top height

l height

---

en standing, or
stool.

t of vertical work

ht of services
rols

top height

height

---

n seated in a

t of vertical work

ht of services
rols

ht of support sur-
for rig.

---

n seated working

Working heights in the user's workspace depend on the user height, seat height and nature of work. According to the common patterns of use, some working heights in the user's workspace have been generally related to the user height, seat height and nature of work in Figures 3.21 (q), (r) and (s).

(6), pp. 275)

3.21 (t_2)

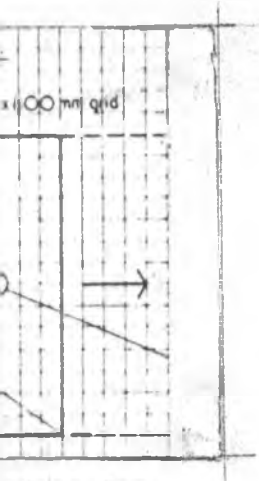
(b_2) : SPACE ADEQUACY NEEDS

For the efficient use of the worktop, there is need for at least 600mm width of knee-hole space under the bench at each workstation. Otherwise the back of the worktop may not be accessible to the seated user. See Figure 3.21 (t_1) and t_2).

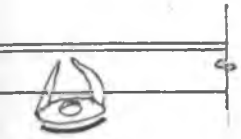
It is necessary to provide for dead storage, like student project work, that might otherwise consume usable worktop area. Shelves, hooks, pin-up boards or storage niches above the window (Figure 3.21 (u) Zone (x) would best serve the purpose of storage cum display.

Common patterns of use show that access to the back of extreme low zones of storage is difficult. Units of storage that allow for adjustability in height are necessary (Figure 3.21(v)). Shelves or trays may be placed in the storage unit at various adjustable heights.

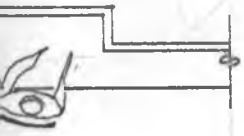
storage unit.



tions for



traight



ary wall

(c_1) : SPACE MORPHOLOGY REQUIREMENTS

The proportions of the laboratory space and the configuration of it's enveloping surfaces affect the performance of the space. Long and narrow laboratory spaces, for instances, do not favour audio communication, visual communication and flexibility of layout.

Figure 3.21 (w) illustrates the recommended proportions that shape a teaching laboratory. Thus where constant audio and visual contact between teacher and all students is important. The laboratory space should be designed within a plan proportion of 1 x 1 to 1 x 1½ (A to B). However, in universities and further education, institutions with large classes of up to 100 students, the proportions my exceed 1 x 1½.

Undulating boundary walls, on the other hand, may lead to uneconomical, large depths of worktop and storage. Figure 3.21 (x_1) shows the consistency of worktop and storage depths along the straight boundary wall while Figure 3.21 (x_2) shows the occurence of large depths of worktop and storage along the undulating boundary wall.

(c_2) : SPACE MORPHOLOGY NEEDS

Whatever the case, there is need to keep the space proportions as close to 1 x 1 as possible for optimum audio, visual and flexibility requirements.

3.22(b) - undifferentiated space type or multi-purpose

TYPE II

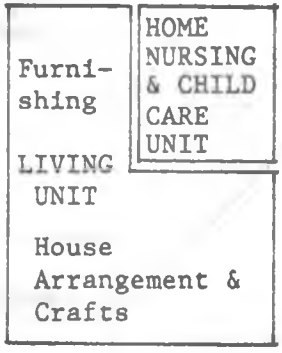


Figure 3.22 (d)

3.22 : HOME SCIENCE

Home Science covers four main areas:- Family living, Foods and Nutrition, Laundry, Textiles and Clothing. The provisions for these are laboratory/ craft based and vary from region to region. For instance, in Type I (Figure 3.22 (a) the different activities are accommodated in different spaces while in Type II the different activiities are accommodated in one space. (Figure 3.22 (b)).

TYPE I

A. FAMILY LIVING

This is the central activity and covers three main areas : the living unit, the home nursing unit, and the child care unit.

a) SPACE ORGANISATION REQUIREMENTS

It is convenient to group together the areas that require servicing and leave the rest of the space to those that do not require servicing. Example 3.22 (c) and Figure 3.22(d) shows Home Nursing and Child Care areas grouped and serviced by a sink and worktop. The rest of the space is left for the different alter-

ENGTH
N

d depth
00mm
i)

PLACE
m^2

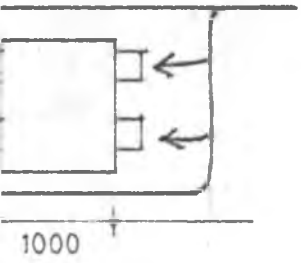
(b_1) : SPACE ADEQUACY REQUIREMENTS

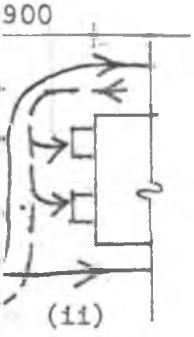
Depending on the nature of work and the common patterns of use, certain worktop lengths per person are considered adequate. Table 3.22 (e) gives the worktop lengths per person for the different types of work.
Furnishing and house arrangements are organisational and may only be provided for in terms of area per place according to the common patterns of use.

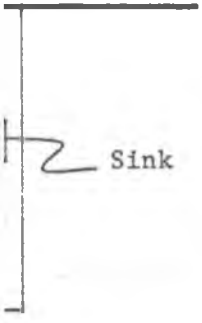
Considering the depths of the work surfaces, the sink and adjacent worktop depths are required standard at 600mm while the craftwork benches or tables may take advantage of sharing to reduce this standard depth. See firures 3.22(f) (i) and (ii).

For general teaching space for Family living, an average area per place may be arrived at by considering, differnt areas. Table 3.22 (g) gives the average area per place for a general Family living space based on comparisons.

(4), pp. 41)







RSING &
ARE AREA

Depending on the nature and volume of traffic involved, circulation clearances may be critical. The clearances are governed by the neighbouring equipment, furniture, or workers.

Figure 3.22 (h) shows clearances at a craftwork area of a Family living teaching space.

The anthropocentric workplace with its anthropozoic circulation system enable the reduction of circulation clearances between the work stations to almost nil. However, other forms of circulation may penetrate the work area and thus lead to greater clearances. Figures 3.22 (k) (i) and (ii) show the clearances for one way through traffic and two way through traffic between the workstations.

The tucking of Home Nursing and Child Care in one corner stops through-way circulation leading to smaller clearances. Figure 3.22 (l) shows the clearance reduced to that of two workers back to back and no through traffic (6), pp. 279).

It is also important that the entry door(s be 1.5 to 2.0 - leaf to cater for possible furniture movement or items wider than the normal single leaf door opening. The critical working height, according to common patterns of use is 760mm with a corresponding seat height of 450mm.

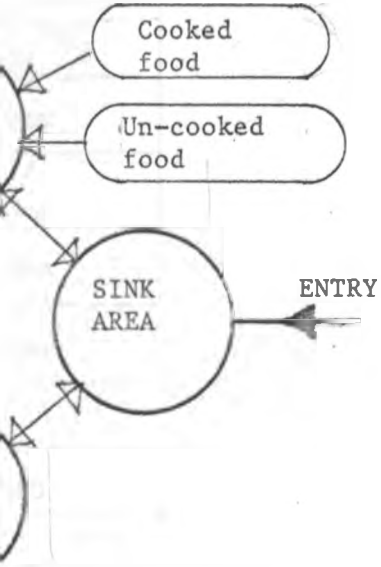
(c_1) SPACE MORPHOLOGY REQUIREMENTS

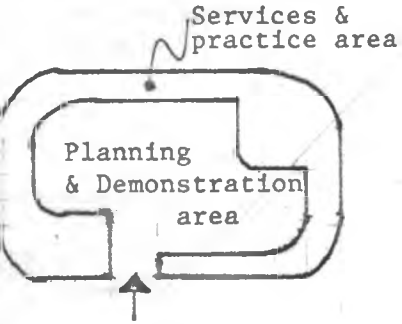
Furnishing and house arrangement in a teaching space entail variety and hence flexibility. Space proportions of 1x1 or close to 1x1, are more accommodative to flexibility than linear proportions.

(c_2) SPACE MORPHOLOGY NEEDS

The Home Nursing and Child Care Unit is distinct from the furnishing and house arrangement unit. Occasionally a screen is drawn to separate the two on pivacy or organisational grounds. See Figure 3.22 (m).

Surface features i.e. wall, floor or ceiling forms may be used to distinguish between the Home Nursing and Child Care Unit from the Living Unit without necessarily employing restrictive physical boundaries. (See Figure 3.22 (n) and 3.22 (o).





3.22 B (c)

B. FOODS AND NUTRITION

Three main areas are involved : the storage area, the sink area and the cooking area. For teaching spaces, however, planning and demonstration spaces are mandatory.

(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.22 B (a) illustrates the proximity and relationship of the three areas. The sink area, which initiates and terminates the series of activities, is best provided for close to the entry point and not in a tight corner.

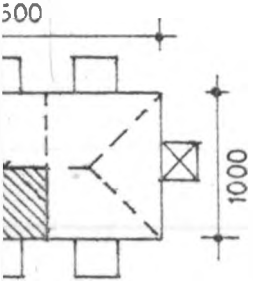
Example 3.22 B (b) is one of the layouts recommended for an 18 student Food and Nutrition teaching space. Here Meal planning and Demonstration area are centralized for all, while the Services and Practice area are limited to the periphery. See Figure 3.22 B (c).

(a_2) SPACE ORGANISATION NEEDS

There is need for the centralization of foodstuff storage and infrequently used equipment for safety and security. It is necessary that the Meal planning area be free for discussion groups and the very frequently used equipment limited to the peripheral service and practice area.

LENGTH ON
0mm
0mm
0mm
0mm

500



constant effective
ut reduced worktop
per person
)

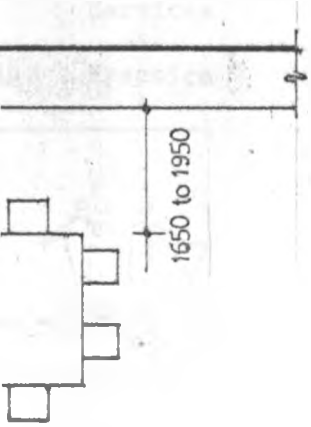
CE
2

(b_1) : SPACE ADEQUACY REQUIREMENTS

Table 3.22 (d) gives the worktop lengths per person for the Food and Nutrition teaching space - based on the common patterns of use. Meal planning, which mainly involves discussions and note taking, requires less worktop length than the 750mm for craftwork. Figure 3.23 B (e) (ii) shows how the use of 6 seats rather than 4 at an otherwise craftwork table reduces the worktop length per person and makes it more suitable for Meal planning than craftwork.

The sink, worktops and cooking area depths are maintained at 600mm - the maximum convenient depth of reach. Shallower depths are limiting while deeper depths are uneconomical and read to dead spaces and storage. Discussions and note making at the meal planning area can cope with shallower depths than 600mm.

For a general teaching space for Foods and Nutrition, an average area per place may be arrived at by considering different cases. Table 3.23 B (f) gives the average area per place for a general Food and Nutrition teaching space - based on comparisons.



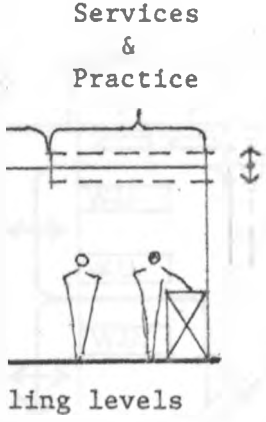
The nature and volume of traffic determine the resultant circulation clearances. The critical clearances occur between the Meal planning workstations and between these workstations and the practice areas (i.e. washing, cooking and storing). Figure 3.23 B (g) shows the clearances for the critical two way through traffic between Meal planning workstations, and between these workstations and the practice area.

The critical working height at the sink and cooking areas is 850mm. Heights above 850mm are a disvantage to the short users. Figures 3.23 B (h) (i) and (ii) give some of the critical vertical heights at a cooking area and at a sink area, and according to common patterns of use, the Meal planning and Demonstration area working heights are convenient at 760mm with a corresponding seat height of 450mm.

Sink Area
(ii)

(b_1) SPACE ADEQUACY NEEDS

Some of the activities e.g. peeling of potatoes, winnowing etc. are best done externally. An external space close and specific to the Foods and Nutrition teaching space is necessary.



(c_1) SPACE MORPHOLOGY REQUIREMENTS

Meal planning and Demonstration may involve grouping patterns. Tables may be used singly by single groups, or combined for larger discussion or demonstration groups. In this area the space proportions ought to be close to lxl to cater for the necessary flexibility.

(c_2) SPACE MORPHOLOGY NEEDS

There is need to distinguish between the Meal planning and Demonstration area, and the Services and Practice area by use of surface features rather than isolate them by distance or physical boundaries. See sectional sketches 3.23 B (k) and (l).

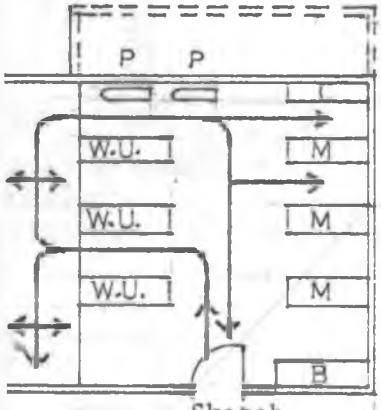
C. LAUNDRY

Four main areas are covered : the preparation area, the washing area/wet area, the drying area and the pressing area.

(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.22 C (a) illustrates the proximity and relationship of the four areas. The washing area is control with the preparation, drying and pressing areas rotating directly to it.

Example 3.23 C (b) is one of the layouts recommended for a 22 student laundry teaching space. The washing area is denied its centrality and direct relationship to the drying area. This increases the possibility of accidents especially at point X. Sketch 3.22 C (c) illustrates a convenient layout with restored centrality of washing area and its direct relationship to the drying area.



Sketch
3.22 C (c)

hing Unit
ding Table
ler
board
ssing Board

(a_2) SPACE ORGANISATION NEEDS

Depending on the properties of the clothes, there is need for differentiated washing, drying and storage areas. For instance, the separation of coloured clothes from white clothes during the washing phase. The drying

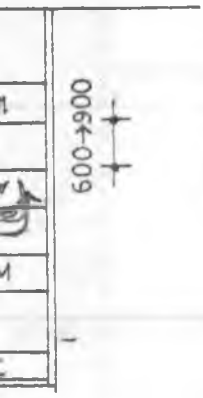
of some clothes in shade and some in the sun.

(b_1) SPACE ADEQUACY REQUIREMENTS

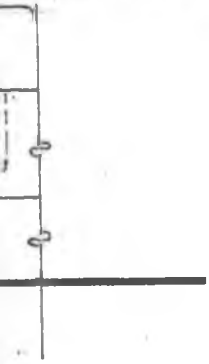
Table 3.22 C (d) gives the worktop lengths per person for the Laundry teaching space - based on the common patterns of use. This lengths may not be suitable for all kinds of Laundry teaching spaces but are a general guideline to the expected worktop length in such spaces.

The washing area and preparation area worktop depths of example 3.22 C (b) are maintained at 500mm. Though the maximum convenient depth of reach (600mm) would very much suit the preparation area worktop, it is excessive for the washing units - where there is need to reach the bottom, rear part of the washing troughs. See Figure 3.22 (e) (i) and (ii).

For a general teaching space for Laundry, an average area per place may be arrived at by considering different cases. Table 3.22 C (f) gives the average area per place for a general Laundry teaching space - based on comparisons.



g and washing in trough



Governed by the proximity of fittings, furniture equipment and workers, circulation clearances ought to be observed. Figure 3.22 C (g) shows clearances at the workplaces of a Laundry teaching space. The peninsula arrangement of the workplaces stops through circulation from the central 2-way circulation spine, enabling clearances as low as 600mm. The 1200mm clearance is adequate for two way circulation but may increase to 1350 if spine is long.

(6), pp. 19)

Although the critical working height at the workplaces is 760mm with a corresponding seat height of 450mm, the washing bench is required stepped down by $\simeq$ 120mm (the average size of a basin). The use of the basin on the bench restores the height to the optimum 760mm. (See sketch 3.22 C (h).

(b_2) SPACE ADEQUACY NEEDS

Washing and drying of clothes are critical processes of the Laundry space in that they involve both the internal and external environment and are space consuming. It is thus necessary for Laundry teaching spaces to be close to ample external space.

(c_1) SPACE MORPHOLOGY REQUIREMENTS

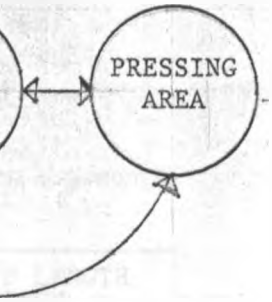
For the clear vision of all the students by the tutor, the proportions of the teaching space ought to be as close to 1:1 as possible. This allows for adequate audio-communication whenever demonstrations are necessary.

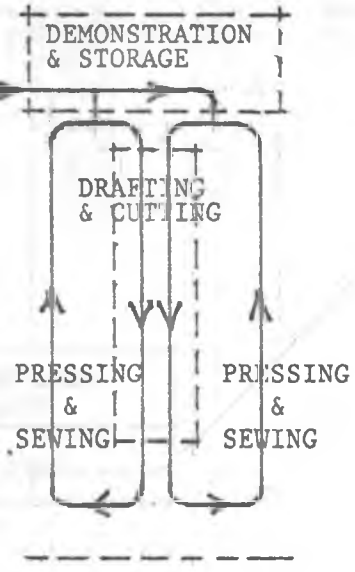
Condering the building envelope, three levels of enclosure are required :

i) an enclosed environment for indoor activities like preparation, pressing, storage and internal washing;

ii) a semi-enclosed, well-ventilated (porous walling and roof) environment for the semi-outdoor activities like under shade drying and verandah space washing;

iii) an open-to-sky environment for outdoor activities like external washing and drying in the sun. See Sketch 3.22 C (k).





3.22 D (c)

D. TEXTILES AND CLOTHING

This involves four main areas : the storage and demonstration area, the drafting and cutting area, the sewing area, and the pressing area.

(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.22 D (a) illustrates the proximity and relationship between the four areas. Storage and demonstration are vital elements to a Textiles and Clothing teaching space and should be readily available at each stage of work due to unfinished work between lessons and re-orientation to the subject matter. Communal storage ought to be centralized for management and surveillance purposes.

Example 3.22 D (b) is one of the layouts recommended for a 48 student Textiles and Clothing teaching space. Here the drafting and cutting area has been centralized by virtually combining two sequencial loops. However, the opening and closing activity (at entry point) is demonstration and storage.

(a_2) SPACE ORGANISATION NEEDS

The drafting and cutting area involves discussions and sketches. The space, thus should cater for both individual and group work.

(b) SPACE ADEQUACY REQUIREMENTS

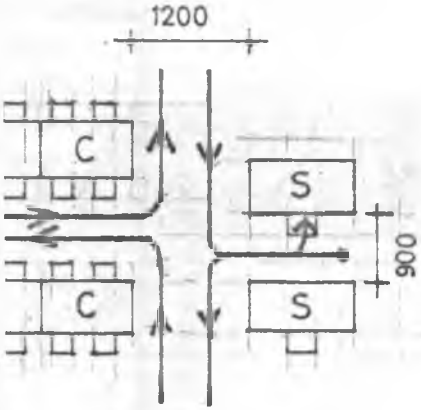
Table 3.22 D (d) gives the worktop lengths/person for a Textiles and Clothing teaching space; based on the common patterns of use. Some of these lengths are standard and thus not influenced by the context e.g. sewing machine worktop length per person, while some may be influenced by the context e.g. drafting and cutting worktop length per person. Since the upper limit is checked by cost, it is only logical to talk about the lower limit of adequacy.

Apart from the pressing board, which has a width of 300mm to 420mm, the drafting and cutting worktop depth, the serving machine worktop depth, and the textile bench depth are (with reference to example 3.22 D (b) 500mm.

For a general teaching space for textiles and clothing, an average area per place may be arrived at by considering different cases. Table 3.22 D (e) gives the average area per place for a general textiles and clothing teaching -

P LENGTH RSON
0mm
0mm
0mm

E AREA ACE
34m^2



KEY

C– Drafting & Cutting table

S– Sewing machine

igrue 3.22 D (f)

)

based on comparisons.

Still on example 3.22 D (b), the proximity of fittings, furniture and equipment creates three forms of circulation : the main 2-way loop-circulation to all the places, the secondary 2-way link-circulation between the drafting and cutting places, and the tertiary dead end circulation to the workplaces. Figure 3.22 D (f) gives the lower limit of adequacy for the three different forms of circulation

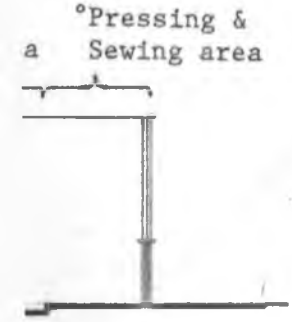
The convenient working height for drafting and cutting and sewing is 760mm with a corresponding seat height of 450mm. For pressing, however, the convenient working height when standing is 850 to 900mm and 650mm when seated on a 450mm high seat.

(6), pp. 60)

(b_2) SPACE ADEQUACY NEEDS

Though most of the Textiles and Clothing work is done indoors, the use of verandah and external spaces for hand sewing, cutting and pressing must not be ruled out.

D (g)



) (h)

(c_1) SPACE MORPHOLOGY REQUIREMENTS

Since the teacher goes round from workstation to workstation, the proportions of a Textiles and Clothing teaching space may exceed lxl. Long teaching spaces, however, lead to lengthy trips to the demonstration area.

Due to group activity and discussions, flexibility is required at the drafting and cutting area. The proportion of such spaces should be as close as possible to lxl to allow for the necessary flexibility and those of the less flexible ones linear and peripheral. See Sketch plan 3.22 D (g)

(c_2) SPACE MORPHOLOGY NEEDS

In cases where furniture movement may cause territorial ambiguity, the different work areas may be distinguished by change of level or surface treatment. Sketch section 3.22 D (h) illustrates the use of the floor plane in distinguishing between different related activities. The wall and ceiling plane may also be exploited.

eeks clothing
eeks cooking
eeks Laundering
eeks Family
living

ce used for a
mon purposes at
ferent times

22 M (b)

TYPE II

Here the different activities of Home Science teaching spaces are accommodated or catered for in one space. This makes the space type undifferentiated or multi-purpose.

(a_1) SPACE ORGANISATION REQUIREMENTS

A multi-purpose space may be used differently at the same time or used for a common purpose at different times. See examples 3.22 M (a) and (b). Though the space use patterns are different for the two cases, the required space type is the same - flexibility being mandatory.

The differentiated space use case is suitable for small group sizes below 20. The method of group division then would be, for example : 6 clothing, 6 cooking, 6 family living, 2 laundering. On the other hand, the undifferentiated space use case is suitable for large group sizes of 20 - 40 person. The method of group division then would be, for example, 8 weeks clothing, 8 weeks cooking, 8 weeks laundering, and 8 weeks family living.

Though multi-purpose spaces may be economical in space use, they entail high maintenance costs and territorial ambiquity.

(a_2) SPACE ORGANISATION NEEDS

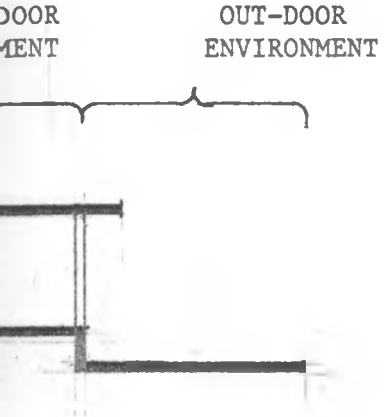
No doubt, there is need for storage of unused and faulty equipment. The furniture, equipment and fittings ought to be light and movable. Storage cabinets, if not movable are best located on the periphery of the space.

(b_1) SPACE ADEQUACY REQUIREMENTS

The worktop length per person, the depths, area per person, circulation clearances and working heights have already been discussed in the individual activity section. However, in cases where two or more similar activities are combined, the larger dimensions should be considered in catering for the combined activities.

(b_2) SPACE ADEQUACY NEEDS

The internal environment alone is not adequate for the necessary flexibility of grouping and the growth in numbers. There is need for a supportive external environment to cater for spill overs or larger inter-class demonstrations, discussions or exhibitions.



(c_1) SPACE MORPHOLOGY REQUIREMENTS

The essence of flexibility limits the proportions of the space to and about 1x1. It is also essential that the inbuilt facilities be minimal and limited to the periphery.

(c_2) SPACE MORPHOLOGY NEEDS

Though a number of Home Science activities are done indoor, some e.g. laundry, textiles and clothing are suited to a semi-indoor and an outdoor environment. The space envelope is relied upon in the articulation of three levels of enclosure i.e. the indoor environment, the semi-indoor environment and the out-door environment. See sketch 3.22 M (c).

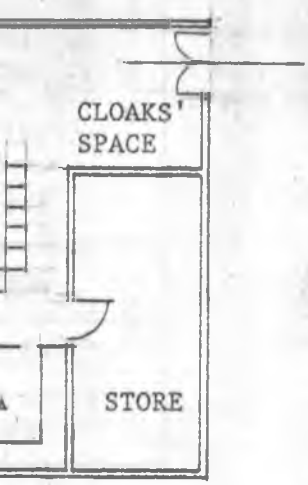
3.30 : THE ARTS AND CRAFTS

The Arts are mainly of:-

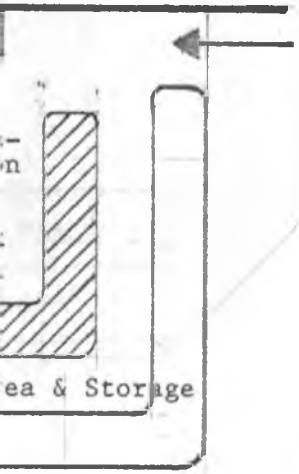
i) The Visual Arts, which consist mainly of: drawing and painting, fabric printing, and clay modeling and pottery.

ii) The performing Arts, which consists mainly of music and physical education. The Crafts mainly consist of leather work, wood work and metal work.

As for Home Science, the different activity types may be catered for in different spaces (TYPE 1) or in one space (TYPE II). Both types are considered starting with TYPE I.



A (a)



A (b)

3.31 : THE ARTS

TYPE I (different activity types in)
(different spaces.)

A - DRAWING & PAINTING

Three main areas are involved:- the demonstration area, the work area and the storage area.

(a_1) - SPACE ORGANISATION REQUIREMENTS

For effective illustrations and displays, it is vital to centralize the demonstration area and limit the auxilliary spaces like storage and painting alcoves to the periphery. Service facilities like the wash basin are best placed at the circulation edge, node or terminous. See Example 3.31 A (a) and Sketch 3.31 A (b).

(a_2) - SPACE ORGANISATION NEEDS

A part from the central form of organisations the formation of smaller discussion and display groupings are necessary.

GTH IN MM
189
841
594
420
297

zes used

PLACE
30m²

(b_1) : SPACE ADEQUACY REQUIREMENTS

Depending on the common patterns of use, certain worktop lengths per person are considered adequate. In the drawing and painting teaching spaces, the length and depth of the drawing base are determined by the sizes of paper frequently used (the upper limit being critical). Table 3.31 A (c) gives a sample of the standard paper sizes used.

For a general drawing and painting teaching space, there is an expected range of areas per place drives from common patters of use. Table 3.31 A (d) gives the range of expected areas per place in a drawing and painting studio - based on common patterns of use.

(b_2) : SPACE ADEQUACY NEEDS

There is need for a reference point at the work-station. This may be in the form a table or a vertical screen : screens have the advantage of keeping the floor area needed to minimum but at the expense of controlled supervision. Reference tables, on the other hand, provide drawings' storage space below the drawing base but are more extravagant on the floor area.

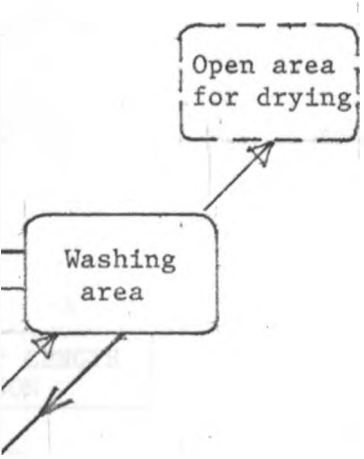
Alongside the need for a reference point, the drawing base is best when adjustable to suit the various subjective drawing base angles.

(c_1) SPACE MORPHOLOGY REQUIREMENTS

For the required flexibility, audio and Visual communication adequacy in a Visual Arts teaching space, it is essential for the space proportions to be as close to 1:1 as possible.

(c_2) SPACE MORPHOLOGY NEEDS

Demonstrative and illustrative display within the Visual Arts teaching space and even to the outside by use of pin-up boards, alcoves, niches etc. is a strong way of characterizing the teaching space.



B. FABRIC PRINTING

Four main areas are involved : the designing and experimental area, the storage and display area, the washing, drying and ironing area and the printing area.

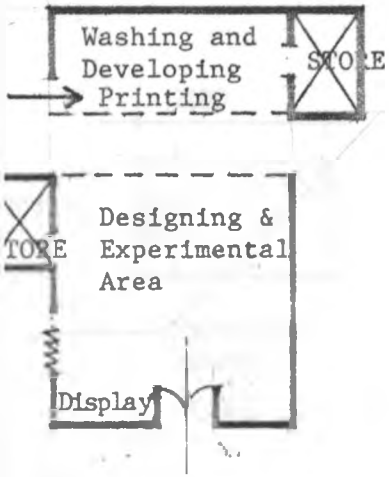
(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.31 B (a) illustrates proximity and relationship of the four areas. From the concentration of arrows it is clear that the storage facility is required at each stage of Fabric Printing. The storage area thus should either be centralized to cater commonly for the different work areas or decentralized to cater differently for the different work areas. Example 3.31 B (b) is one of the layouts recommended for a 16 student Fabric Printing teaching space. The storage facilities are actually differentiated over:

i) the washing and developing and printing areas for storage of finished work;

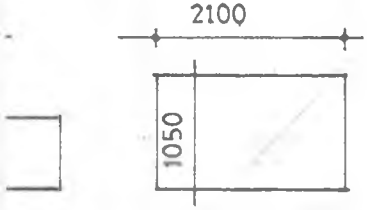
ii) the designing and experimental area for storage of experimental and unfinished work.

In both cases an open area for drying is accessible. See sketch 3.31 B (c).



3.31 B (c)

)P LENGTH tSON
)mm
)mm
)mm



Printing bench

(iii)

(a_2) SPACE ORGANISATION NEEDS

The designing and experimental area involves a variety of grouping patterns. This calls for a variety of alternative layouts and hence proportion's close to or 1x1. There is need to relate the designing and experimental area to an open external environment.

(b_1) SPACE ADEQUACY REQUIREMENTS

Figure 3.31 B (d) gives the worktop lengths per person for the three main types of work in a Fabric Printing teaching space. The 2100mm length of the printing bench caters for the longest commonly used fabric sizes i.e. (between 1800mm and 2100mm). The sink size, 1050mm is large (double the normal size) to allow for the stretching out of fabric.

Considering the depths of the work surfaces, the printing bench should (according to commonly used sizes of fabric) be at least 1050mm deep. The sink facility, which is required large, stretches to the maximum convenient depth of reach (600mm), while the designing and experimental tables exceed this to 750mm to allow for fabric, spreading. For large fabric, the depth of tables may be as large as 900mm.

REA

2

)0

Shelves

KEY

+ - Work table

s - Stool

For general teaching space for Fabric Printing, there exists an average area per place. Table 3.31 B (f) gives the average area per place for a general Fabric Printing teaching space - based on the common patterns of use.

Figure 3.31 B (g) gives some of the critical clearances at the worktables and equipment. These are for one user plus one-person-passage-way, Larger teaching spaces (i.e. involving more than twenty users) are associated with large volumes of traffic and hence require at least one more one-person-passage-way.

(b_2) SPACE ADEQUACY NEEDS

There is need for separate storage space for the Designing and Experimental area and the real (non-experimental) Fabric Printing. Tools used during the experimental session e.g. lino-gouges, cutting knives blocks, coloured ink, paints, brushes etc. are the frequently used equipment and are best stored close to the experimental area.

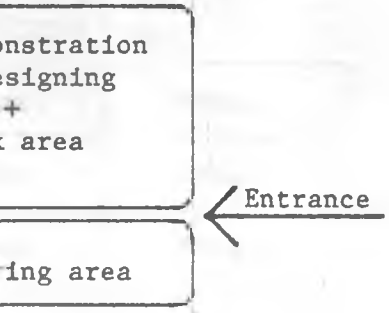
(c_1) SPACE MORPHOLOGY REQUIREMENTS

As for the Drawing and Painting teaching space, good visual and audio-communication space proportions as close as possible to 1:1 are a requirement.

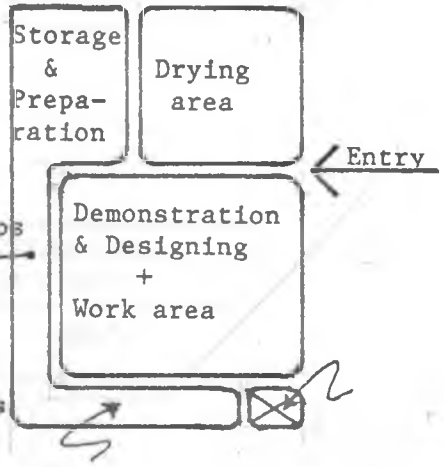
Figure 3.31 B (h) is a plan of an example of a Fabric Printing teaching space with the proportions of the Designing and Experimental area close to 1:1 (i.e. 6500 : 7500). This in addition meets the requirement of variability of layout to suit different group arrangements.

(c_2) SPACE MORPHOLOGY NEEDS

As seen in Figure 3.31 B (h), there is need to differentiate (but not isolate) the Printing and Experimental area. This may be achieved by changes in floor or ceiling levels or surface finishes.



: (a)



Sketch 3.31 C (c)

C. CLAY MODELLING AND POTTERY OR CERAMICS

Consists of five main areas : the demonstration and designing area, the storage and preparation area, the working area, the drying area and the firing are

(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.31 C (a) illustrates the proximity and relationship between the five areas. Close to the entrance are the demonstration and designing area, the work area, and the drying area. The drying is actually a display area for the modelled clay forms. Storage and preparation and the firing area both require servicing. These ought to be grouped together for effective and economical servicing.

Example 3.31 C (b) is one of the layouts recommended for a Clay Modelling and Pottery teaching space. Here the storage and preparation and firing (service areas) are limited to the periphery while the demonstration and designing, the work area and the drying are given dorminance. See sketch 3.31 C (c).

(a_2) SPACE ORGANISATION NEEDS

The damp cardboard (containing wet clay) should never be near a hot pipe or kiln and the drying racks (for wet clay forms) need to be free standing so as to enhance through ventilation. Demonstration and designing

LENG-PERSON	WORKTOP DEPTH
mm	800mm
mm	600mm
mm	600mm
mm	300mm
n	600mm
1300mm	1000mm
1350mm	600mm
900mm	

X

Y

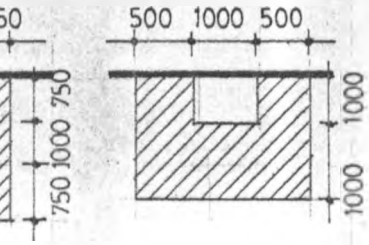
VERAGE AREA ER PLACE
6.0m²

plus work area call for a variety of alternative layouts.

(b) : SPACE ADEQUACY REQUIREMENTS

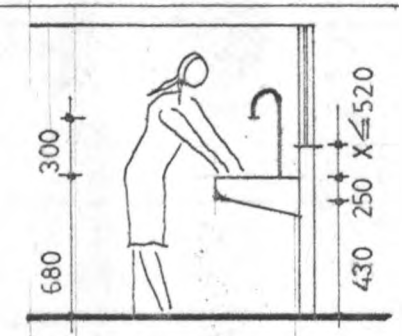
According to common patterns of use, certain worktop lengths are considered adequate for individual use. Table 3.31 (d) gives worktop lengths per person for the main types of work in a Clay Modelling and Pottery teaching space. Some of the lengths (labelled X in table 3.31 C (d) are not standard and thus may be manipulated to the upper or lower end for more worktop surface or circulation clearance respectively. Some are standard and as such may not be manipulated to an upper or lower end (labelled Y in table 3.31 C (d). In this case only the clearances are variable.

Except the drying racks, all the worktop depths are at least 600mm (the maximum depth of convenient reach). For effective natural ventilation at the drying racks, single file arrangement of wet clay forms is required. On the other hand, large depths like those of the storage bins, potter's wheel and kiln, make use movement around the facility to increase the effective depth of reach. Such facilities should not be stuffed in a corner.



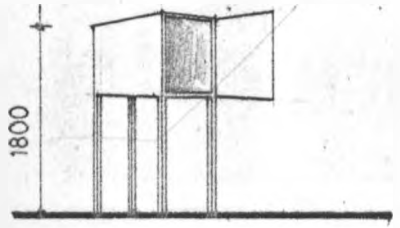
er's (iii) Kiln
l

The critical circulation clearances are at the general work tables, the potters wheel and the kiln. Figure 3.31 C (f) illustrates the general clearances at the three facilities to prevent the crowding up of such facilities at corners or tight zones.



(ii) Large sink

A working height of 600mm is convenient for the general work tables, the wedging bench (for initial preparation of clay moulds), and the sink. Beyond 600mm, the shorter users begin to strain (see Figure 3.31 C (g) (i) and (ii). The slope (wedge) at the wedging bench facilitated drainage of clay forms while the 300mm clearance at the large sink allows for use of containers at the sink.



(ii) Kiln

According to common patterns of use, the damp cardboard (for storage of damp clay) unit maximum height of storage is 1800mm. The Kiln may lie directly on the floor or may be raised. If raised, the upper level must not exceed 1000mm (the maximum height of convenient reach).

(b_2) : SPACE ADEQUACY NEEDS

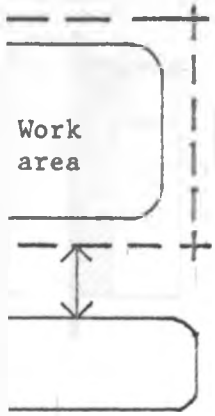
Clay working needs a supplementary external, less restrictive environment. The use of the internal environment alone may lead to congestion.

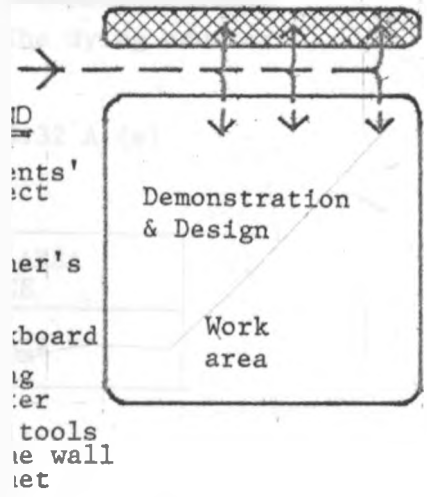
(c_1) : SPACE MORPHOLOGY REQUIREMENTS

The working area (where the prepared clay is modelled) involves alot of movement and requires supervision. For effective visual and audio communication, space proportions as close as possible to 1:1 are required.

(c_2) : SPACE MORPHOLOGY NEEDS

Clay debri is slippery. Changes in floor level thus a dangerous way of differentiating the activity zones. Changes in the walling and ceiling plus are prefereable ways. However, the floor plane should fall gently to a floor channel for easy cleaning of the floor.





Sketch 3.32 A (c)

3.32 : THE CRAFTS

TYPE I (Different activity types in different spaces)

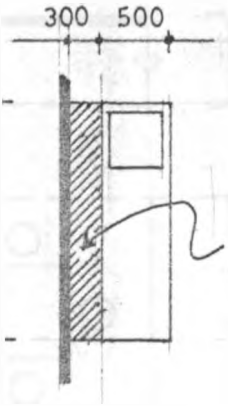
A. LEATHER WORKS

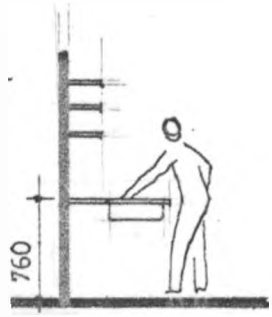
Consists of three main areas: the demonstration and design area, the storage area, and the work area.

(a_1) SPACE ORGANISATION REQUIREMENTS

Figure 3.32 A (a) illustrates the proximity and relationship between the three areas. Due to portable instruction by use of a movable chalk or pin-up board, it is, logical to merge the closely related demonstration and design area, and the work area. The storage of delicate, communal or infrequently used material should be detached and centralized for safety and management purposes.

Plate 3.32 A (b) shows one of the layouts recommended for a 16 student Leather Work teaching space. Here the service facilities are linearly organised and detached from the demonstration and design/work area by the main circulation spine. See sketch 3.32 A (c).





'he dying counter

.32 A (e)

AREA E
m²

(a_2) SPACE ORGANISATION NEEDS

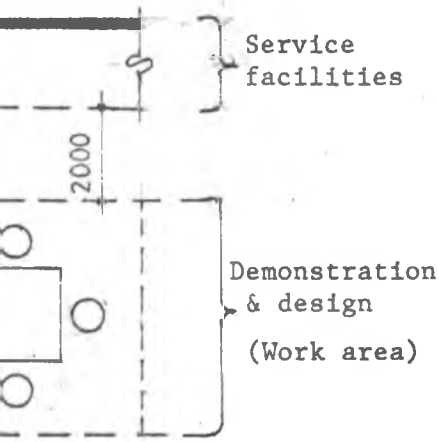
Since the workstations are virtually stationary, there is need for pin-up boards or demonstration points at each workstation on a portable demonstration system.

(b_1) SPACE ADEQUACY REQUIREMENTS

Leather work activities are centred around the work tables and the dying counter. Figures 3.32 A (d) and (e) give the space dimensions that are considered adequate for the worktables and the dying counter. The effective length x depth of work tables per person is 500mm x 500mm with a clearance of 1000mm on each side and for the dying counter the convenient length and depths are 2500mm and 800mm. 300mm of this 800mm is taken up by shelves leaving a less deep 500mm as effective counter.

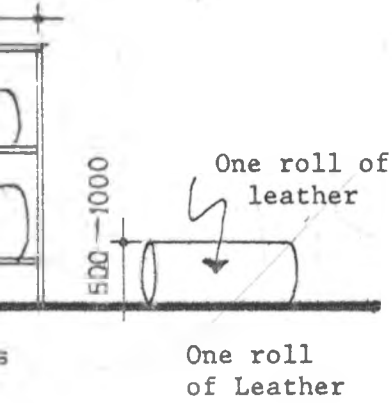
Little equipment is required for a leather work teaching space and thus leather work may be learnt in any spaceous classroom.

For a general teaching space for Leather work there is an average area per place, based on the common patterns of use. Table 3.32 A (f) gives the average area per place for a general leather work teaching space.



Leatherwork entails the use of sharp tools and thus it is essential to observe the critical circulation clearances. Sketch plan 3.32 A (g) gives the critical clearances at the work area and to the service facilities for a 36 student teaching space.

The raw material (Leather) may be stored flat on a large surface (8m^2 maximum and raised above floor) or may be rolled up and stored in storage shelves (see sketch 3.32 A (h). Though space consuming, the later is preferred for adequate ventilation and preventation of wrinkles.



(b_2) SPACE ADEQUACY NEEDS

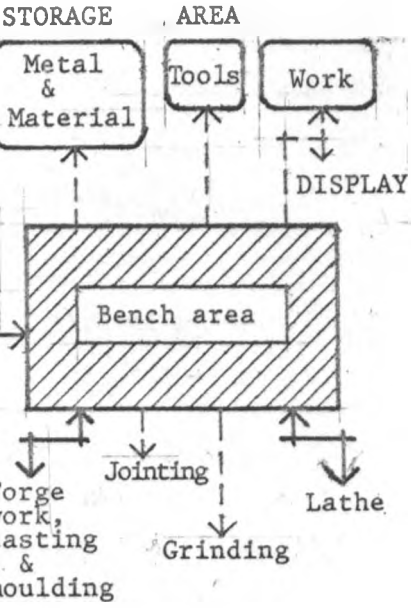
The tools used for leather work are sharp and hence free circulation space around the work tables is very necessary if injuries are to be minimised. For student informal leather work activities like the repair of shoes, an external environment is required.

(c_1) SPACE MORPHOLOGY REQUIREMENTS

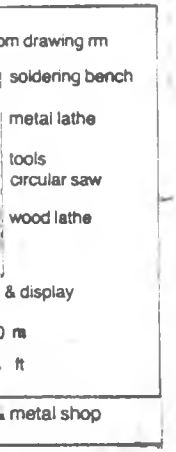
Like the other workspaces where serveillance is an issue, the proportions should be close to 1:1. Long and narrow spaces are associated with longer commuter passageways and consequently greater chances for accidents.

(c_2) SPACE MORPHOLOGY NEEDS

Apart from the need for porosity of the storage space walling (ventilation) the rest of the space is Synonymous to the ordinary classroom.



3.31 B (d) METALWORK



B. WOOD WORK AND METAL WORK

Due to similarity in activities, processing and equipment, woodwork may (for economical reasons) be combined with metal work. However, it is important to note that in combined shops attention must be paid to danger from fire. Diagrams 3.31 B (a) and (b) illustrate the similarity between the wood and metal work activities.

(a_1) SPACE ORGANISATION REQUIREMENTS

All the activities evolve around the bench area. Depending on the stage and nature of work there may occur short duration activity (short term) or long duration activity. Illustrations 3.31 B (c) and (d) show the short and long duration activity areas in relation to the bench area. Thus the bench areas is the central work zone with the support facilities e.g. lathe limited to the periphery as reference zone. See plate 3.31 B (e).

(a_2) SPACE ORGANISATION NEEDS

It is necessary that the drawing room be adjacent to the wood and metal work teaching space so that the planning may be done on convenient surfaces. And it is also convenient for the cutting devices e.g. the circular saw to be close to the store for the materials to be reduced to the necessary sizes without traversing the

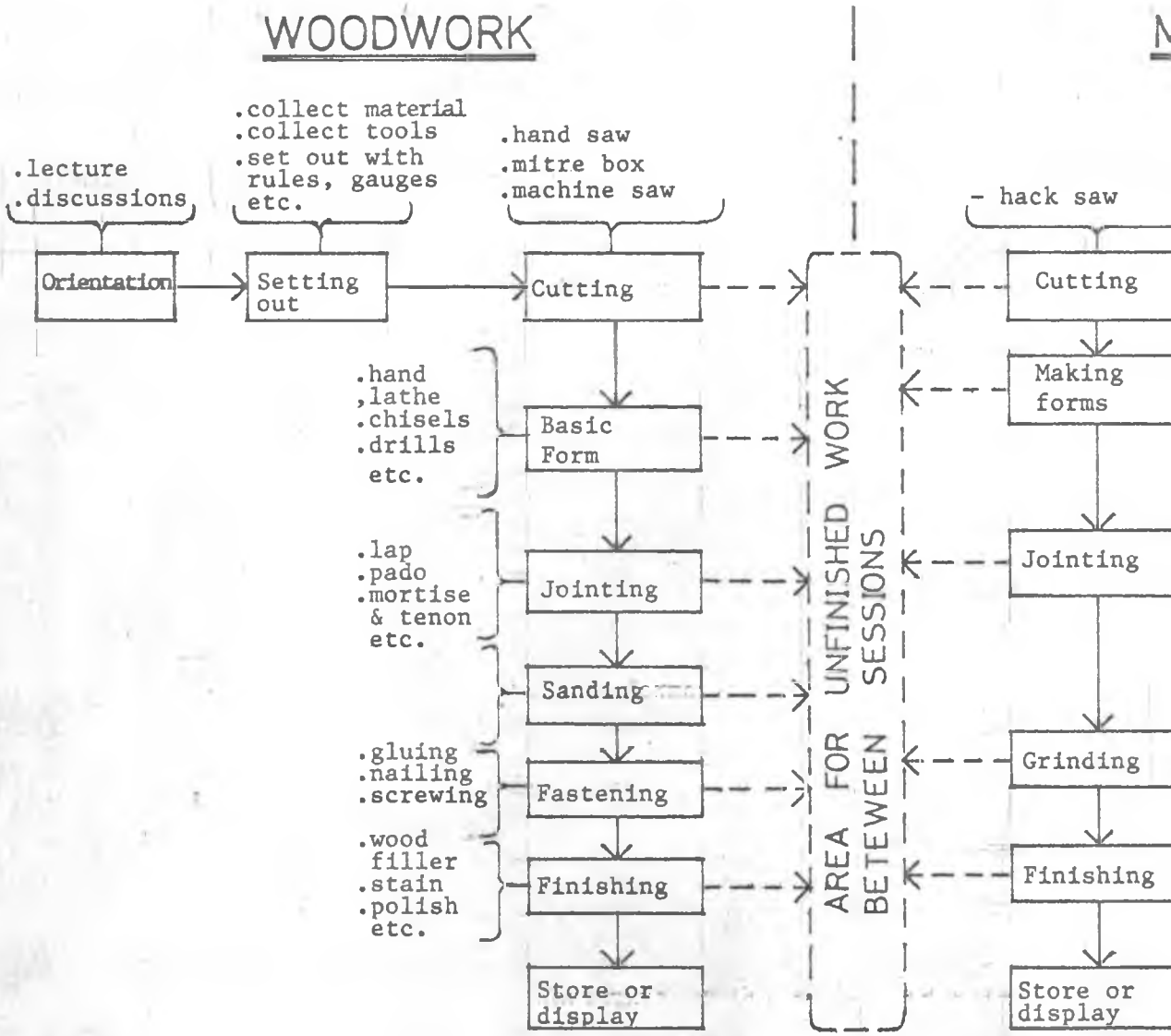
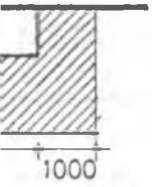


Diagram 3.31 B (a)

Diagram 3.31

(4), pp.36-37



etal work
i)

perating position
lathe
)

tal work

B (h)

REA

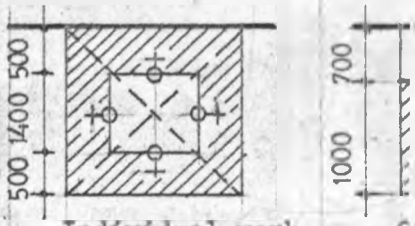
2

whole-space first.

(b_1) SPACE ADEQUACY REQUIREMENTS

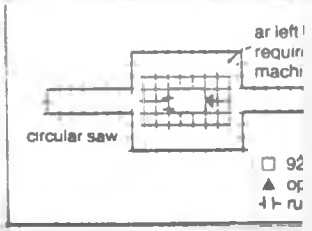
Due to the similarity between Woodwork and Metal work teaching spaces, it is logical to consider their utilities side by side. Here the worktop lengths, widths, and clearances of the main utilities are considered in combination for each case.

Considering illustrations 3.31 B (f) and 3.31 B (h), it is clear that the working space around both wood and metal work equipment, furniture and machinery is large. This not only ensures adequate to manouvreing space for the sheet and rod materials used; but provides the necessary clearances against accidents. The circular saw, for instance, involves the movement of rod, bar and sheet timber forms. Tucking such a facility in a corner would thus only invite accidents. The forge work area, on the other hand, emits dust and gaseous fumes and involves hotworking of rod, bar and sheet metal forms of material. For safety and convenience in the use of such facilities there are critical space requirements below which accidents may be frequent. Illustration 3.31 B (h) part (v) shows a central hearth, h, (900 wide x 900 long) with its hood, f, above in a space length of 6000mm. The two anvils (to cater for forging on either side heath) are located at the extreme ends of the 6000mm length.



Individual work
(i)

(iii)



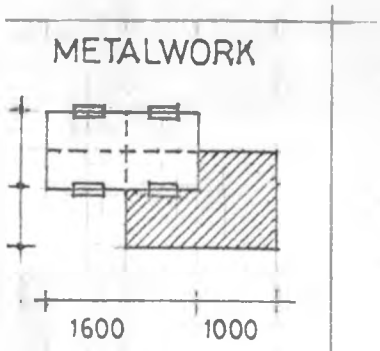
(v)

Working spaces round woo

ILLUSTRATION 3.

SPACE TYPE	AVER/ PER
WOOD WORK	

TABLE 3.31 B (g)



o users on one side work surface

3.31 B (h) (i)

Considering the individual work places, woodwork places involve a lot of hand planing and chiselling. These mainly occur along the length of the work surface. As a solution territorial ambiguity along the lengths of the work surfaces, common patterns of use make use of a 4-sided work surface with each side allocated to one user - See 3.31 B (f) (i). Metal work places mainly involve hack sawing of filing these mainly occur across the length of the work surface. Two or more users may use the side of a work surface with minimal or no territorial conflicts. See 3.31 B (h) (i).

For a combined woodwork and metalwork bench area, the larger clearances (mainly metal work) are considered critical. Plate 3.31 (1) gives some of the critical clearacnes around metal work benches.

Table 3.31 B (m) summarizes the clearances into four types alongside their spaces adequacies:-

i) between two operational bench edges and a non-operational one.

ii) between two operational bench edges.

iii) between non-operational bench edge and an operational equipment edge.

iv) between an operational bench edge and an operational equipment edge.

(b_2) - SPACE ADEQUACY NEEDS

Ocassionally lengths of timber and metal are manu-oevred into and out of the store. Timber bar lengths may be as long as 20 feet (6 metres) while metal bars or rods may be as long as 40 feet (12 metres). The use of alligned double doors to and from the store is necessary for easy movement of the material ~~lengths~~.

(c_1) - SPACE MORPHOLOGY REQUIREMENTS

Wood and metal work primary teaching spaces require the teachers supervision. Proportion's not greater than 1:1½ are suitable.

(c_2) - SPACE MORPHOLOGY NEEDS

Due to the nature of the wood and metal crafts, movement from one zone of the space to another, using the various types of equipments must be continous. Changes in floor levels as a means of differentiating the different activity zones is thus not encouraged.

CHAPTER

ASPECTS FOR CONSIDERATION

Since space is the house of the users characteristic activities, it is important to consider:-

i) The user characteristics and needs.

ii) The space characteristics and needs.

4.10 : USER CHARACTERISTICS AND NEEDS

Certain activities and provisions. For instance, planing is characteristic of wood crafts the activities and their provisions may be individual based or group based.

4.11 a) USER ACTIVITIES

i) GROUP ACTIVITIES

Two or more persons may team up for collaboration purposes, economy of resources, discussions, or group study. The formation of such groups may be organized i.e. on administrative grounds, or spontaneous, i.e. according to needs.

ii) INDIVIDUAL ACTIVITIES

For closer study or private practice, some activities may be done individually. Such activities are usually subjective and specific to the individual.

4.11 b) USER PROVISIONS

These are the user's basic material necessities for the corresponding activities in the area of study. Likewise the provisions may be individual or group based.

i) GROUP PROVISIONS

These are general to the individuals and thus applicable to more than one individual.

Group provisions, however, may be quantity specific i.e. cater for a fixed number of users, or may cater for a varied number of users.

ii) INDIVIDUAL PROVISIONS

These are specific to the individual users. Though the provisions are standardized for economy of production, subjective needs may call for specific provisions.

4.12 : USER NEEDS

Some material or performance necessities may have been ignored or overlooked by the initial set-up. These may be group based or individual based.

a) GROUP NEEDS

Material or performance necessities of more than

one individual user.

b) INDIVIDUAL NEEDS

Material or performance necessities of one individual user.

4.20 : SPACE CHARACTERISTICS AND NEEDS

Due to the need for space correlation, the subject areas are studied as specific areas within the overall institutional layout rather than in isolation. This helps in illustrating how these subject areas are zoned, accessed and characterizedwithin the overall layout.

4.21 : SPACE CHARACTERISTICS

Certain aspects are characteristic of any given space. The characteristic aspects of space selected for this study are "space organisation" "space adequacy", and "space morphology." Thus, the statements and illustrations of the space provisions to the activities in the areas of study will be in terms of these three aspects. The characteristic aspects may be based on the overal area layout or subject area layout.

a) OVERAL AREA CHARACTERISTICS

The illustrations and statements of the space provisions to the activities in the practical oriented learning places in the context of the oveal institutional layout.

b) SUBJECT AREA CHARACTERISTICS

The illustrations and statements of the space provisions to the activities of a subject area in the context of other practical oriented learning spaces.

4.22 : SPACE NEEDS

The space characteristics may be critically assessed for their performance so as to evoke the space needs. The space needs may be overall to the places of practical oriented learning or specific to particular subject areas.

For both cases the assessment is set as follows:-

a) OVERAL NEEDS

i) Overall space organisation versus performance.

ii) Overall space adequacy versus performance.

iii) Overall space morphology versus performance.

b) SPECIFIC NEEDS

i) Specific space organisation versus performance.

ii) Specific space adequacy versus performance.

iii) Specific space morphology versus performance.

CHAPTER 5

CASE STUDIES:

: the spaces for practical oriented learning in two different situation:-

Lng and established Primary Teachers' Training College on a tight site.
HIGHRIDGE PRIMARY TEACHERS' TRAINING COLLEGE.

Lng and established Primary Teachers' Training College on a spaceous
i.e. THOGOTO PRIMARY TEACHERS' TRAINING COLLEGE

5.10 : CASE STUDY I

° HIGHRIDGE PRIMARY TEACHERS TRAINING COLLEGE - NAIROBI

Before the individual subject areas are studied, their context ought to be understood.

5.11 : CONTEXTUAL INFORMATION

a) Location and Access

The College is located in a compact urban setting within a residential neighbourhood. It is accessed indirectly via the fifth and sixth Parklands Avenues from the busy Limuru road.

b) Background Information

The College was started in 1946 by the Colonial Government to train Asian women teachers' only - the enrolment being four women. By 1963, the enrolment had risen to 120 (both African and Asian women). In 1969, the first lot of men (only eight) was enroled, five student teachers for the mentally handicapped children came to train and the enrolment rose from 120 to 240.

In 1980, another Special Education Course for the visually handicapped children was started within an enrolment of fifteen student teachers. The Special Edcuation section was transferred to the now K.I.S.E. at Kasarani in 1986 and the current student population (1992) is 540.

c) LAYOUT

i) Organisation

From either entrance, the learning spaces are deep into the site for less disturbance by external sources of noise. However, there is no clear relationship between the general classrooms and the practical learning spaces. The open courts used here neither isolate nor related the two types of spaces, but mainly light and naturally ventilate the spaces.

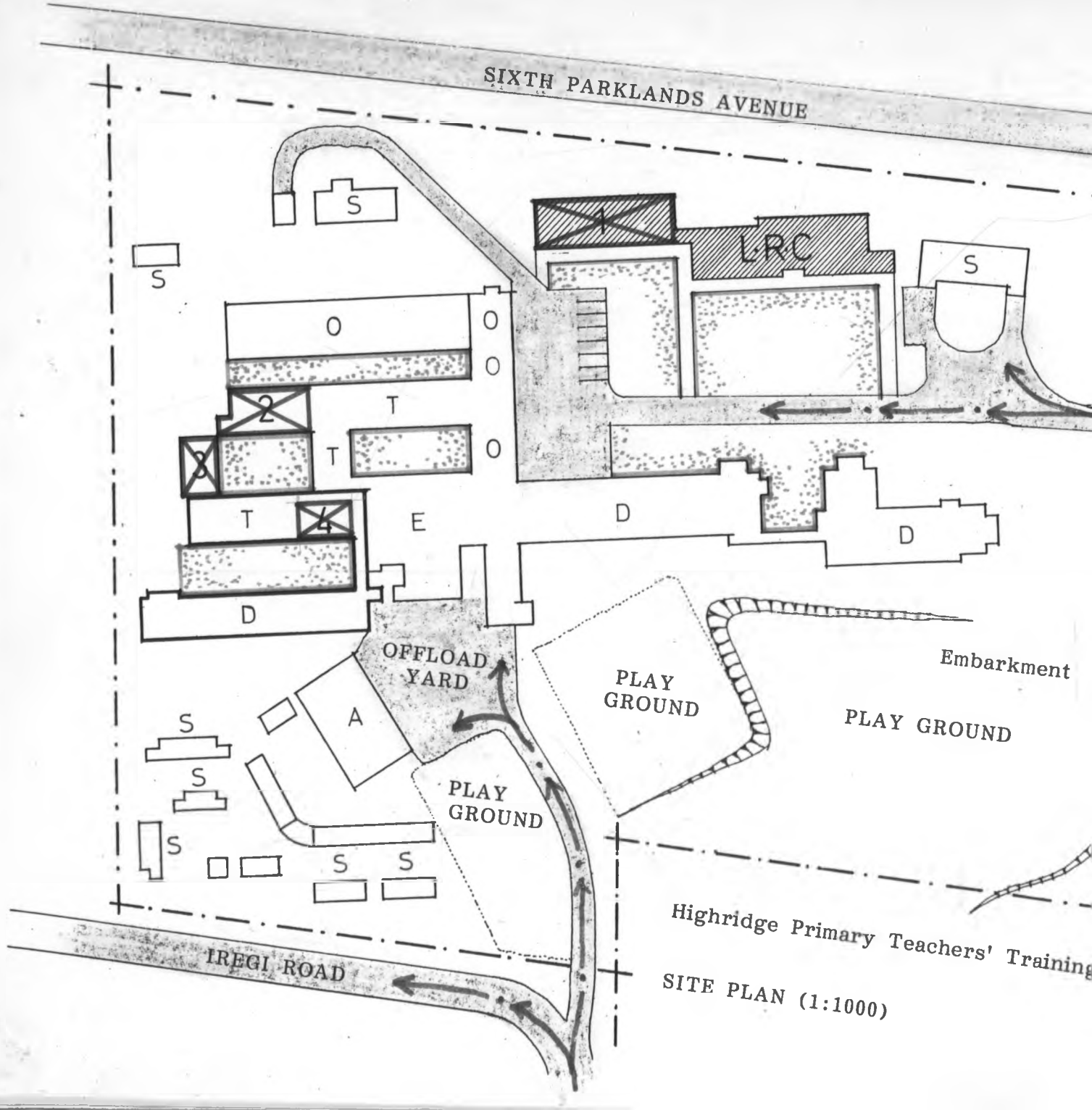
ii) Adequacy

For each of the practical learning subject taught, only one learning spaces is provided. These are seen to be adequate, but when in service, repair, cleansing or preparation, they cannot be used for learning.

Apart from the Home Science teaching space the practical learning spaces are not directly accessible by vehicular traffic.

iii) Morphology

The massing and general form of the layout does not seem to differentiate the practical learning spaces from the general classrooms. Rather the activities were allocated into the spaces of an existing, predetermined built environment.


SIXTH PARKLANDS AVENUE
S
S
L.R.C
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D
OFFLOAD YARD
A
PLAY GROUND
PLAY GROUND
Embarkment
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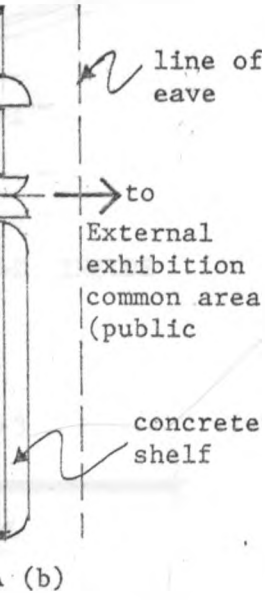
Highridge Primary Teachers' Training
IREGI ROAD
SITE PLAN (1:1000)



(b)

5.12 : THE SUBJECT AREAS

A. GENERAL SCIENCE AND AGRICULTURE

(a_1) PREVALLING SPACE ORGANISATION PATTERNS AND NEEDS

As seen in Plate 5.12 A (a), the distribution and storage of equipemnt is dispersed and the furniture layout consists of long, straight benches operated from one side. This kind of organisation is only convenient for a personalized laboratory situation where the users are a single group. Unfortunately, the use of the laboratory space here is communal, i.e. involves more than one single group of users. The conflict between the use and organisation patterns leads to inefficient management and maintenance during and after the sessions of use.

A possible solution to this conflict is to be found in illustration 5.12 A (b). Here the storage (though differentiated as A-Agricultural of S-Science) is grouped and centralized and only the frequently used equipment is stored under the side benches. This, in addition to the use of shorter island benches enables flexibility of layout at the work area.

The use of an extra door, D2, the presence of an internal side-bench with a corresponding external concrete shelf for external improvisation and exhibition

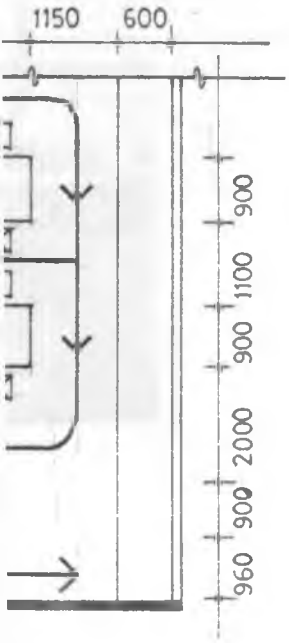
activities, are some of the elements that may strengthen and activate the relationship between the internal and external laboratory activities characteristic of the current primary institution requirements.

Student project work (finished and unfinished) can be seen stored at the side bench in Plate 5.12 A (c). This raises a conflict between workspaces and storage space at the side bench. However, it is clear from this situation that student project work (improvised) not only needs to be stored but needs to be seen. In Plate 5.12 A (c), most of the wall surface is covered by illustrative displays and charts. This idea can be carried further by accommodating, the 3-Dimensional students project work above the window height. See illustration 5.12 A (d) number 1. The more bulky work e.g. charcoal fridge may be stored under the external shelf. See 5.12 A number 4.

INSIDE

KEY TO NUMBERING

1 - 3-Dimensional student work storage
2 - Demonstrative illustrations on wall between window openings.
3 - Storage of frequently used equipment
4 - Storage of bulky and externally used student porject work (improvised).



:angement
ıtended or
ıttern.

ırniture due
:ilization

ıg.

b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

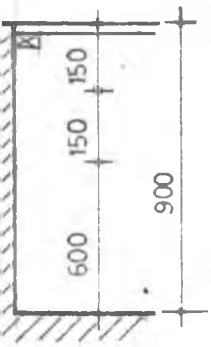
Sketch 5.31 A (e) illustrates the use of long, straight benches of the work area and the associated clearances. The full teahing space consists of 4 island bench units for the students' work area. Though only one side of the bench units is meant to be used, the current utilization patterns take advantage of the large bench depth (900) to make use of both sides of the bench unit. In sketch plan 5.31 A (e) the unhatched forms denote the furniture arrangement due to the intended or design use patterns while the hatched forms denote the additional furniture due to the current utilization patterns. It is, however, unfortunate that the additional furniture reduces the effective circulation space between the work benches leading to crowding and accidents. Since this clearance involves two users back to back plus passage way, the adequate dimensions are 1650 to 1950 (see page 14). The use of shorter island benches can help break the passage length and thus reduce possible build up of circulation volumes which may lead to accidents.

On certain demonstration occassions, the grouping pattern may extend from the intra-class grouping forms to larger inter-class grouping.

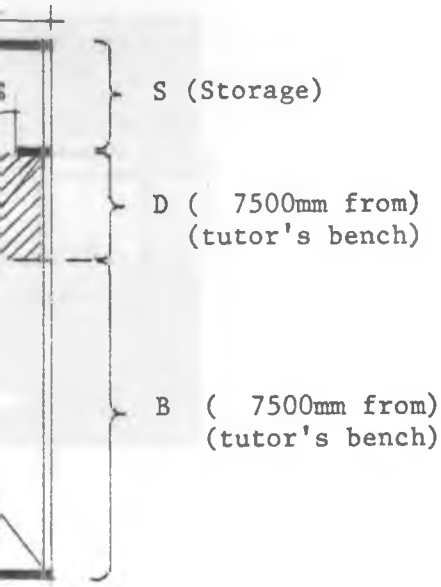
This raises the need for ample external space on either sides of the laboratory space - one side for the more private, improvisation activities and the other for the more public exhibition activities, on Plate 5.31 A (f), the adjacent external space is de-activated by immediate presence of the administration block across.

Though the worktop height for the bench area is 900mm with a corresponding seat height of 650mm, certain tedious activities e.g. classification in the Science of living things are conveniently executed at a work surface lower than the normal worktop height (900mm). Plate 5.31 A (g) shows successful use of a chair as a more convenient work base than the high benches.

One of the ways of alleviating the problem of differentiated worktop height needs is by the provision of adjustable worktop shelves. This may even be further catered for by provision of external workspaces where a variety of surface heights may be improvised to suit the needs. The Agricultural experimental activities (which are mainly outdoor oriented) have alot to benefit from such external workspaces.



Sketch Section 5.12 A (h) is an example of adjustable worktop shelves. In this case the working heights are adjustable by multiples of 150mm according to the spacing of the supportive rails.



ENT

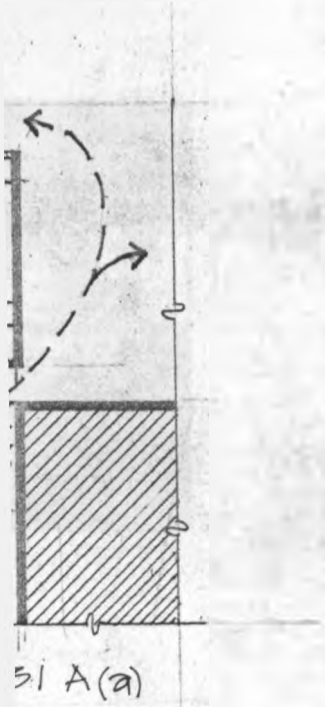
c) : PREVAILING SPACE MORPHOLOGY TYPES AND NEEDS

The proportions of the current learning space are 1;1.63. This causes audio and visual communication inadequacies between the tutor and students in zone D of the learning space (i.e. 7500mm from tutors bench) see illustration 5.12 A (k). The situation is even aggrevated by the use of fixed, long bench units that hinder group discussions and demonstration (i.e. the necessary flexibility is ignored.

To cater for the current utilization patterns, where audio of visual communication together with flexibility are crucial, the proportions of the teaching space ought to be between 1x1 to 1x1½. Secondly, shorter and movable benches that may be combined or separated according to the grouping patterns should be in preference to the long, fixed ones.

5.23 : HOME SCIENCE SPACE USED

Home Science work is currently done in a new space which is a prototype of the IBRD* series of buildings. Since a similar proto-types was studied at Thogoto Teachers' College, it is logical to consider the one at Thogoto only so as to avoid repetition.



5.131 A(a)

b)

5.13 : ARTS AND CRAFTS SUBJECT AREA

5.13 A - VISUAL ARTS SPACE TYPE USED

a) PREVAILING ORGANISATION PATTERNS AND NEEDS

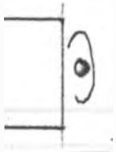
Location of equipment of storage along the periphery leaves a central area that is free far a variety of alternative furniture layouts (Sketch Plan 5.131 A (a). The storage and equipment facilities here include 1 - the potter's wheel, 2 - open racks, 3 - cupboard storage unit, 4 - teachers table, 5 - sink. Since the space is used by more than a single group of users, the delicate, communal and infrequently used material (e.g. clean paper, photographs and sculpture) are stored in the cupboard storage unit (3 above) next to the teachrs desk.

Though there is a strong attempt to cater for different activities in the one space, this is not successful. Clay modelling, for example, is mainly done outside leading to long commuting distances to the potter's wheel. Furthermore, the adjoining space (See Plate 5.131 A (b) lacks variety and is criss-crossed by foot paths while the backyard (currently used for modelling) is traversed by drying lines. The territorial ambiguity together with the lack of variety in the adjacent open space render it unsuitable for

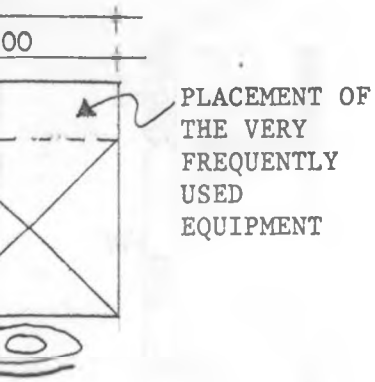
student project work but potential for communal exhibition activities (See Plate 5.131 A (b).

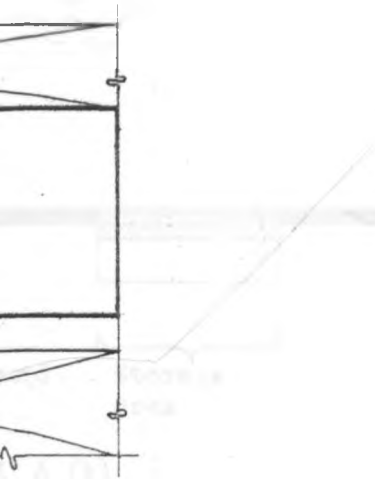
In Plate 5.131 A (c), the scattered paperwork and equipment and drawing equipment illustrate the need for the centralized storage of delicate communally used stationary and equipment. The frequently used materials (though not provided for here) may be catered for by open racks along the periphery of the space,while the very frequently used items are best catered for at the drawing table.

Though the large drawing tables used reduce movement of furniture out of the space they are a hinderance to the necessary flexibility at the work area. This, however, may be solved by splitting the tables into four component parts that may be combined to reform the original table or form other necessary arrangements (See illustration 5.131 A (d).



A (d)





b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

Sketch 5.131 A (e) illustrates the current use of large tables at the work places. These tables take a maximum of 2-users with an individual length x depth space of 750 x 750mm each and a corresponding maximum paper size of A2 (594 x 420mm). Though an individual length x depth of drawing base of 600 x 600mm is sufficient for A2 size of drawing paper, 750 x 750mm is prefered (according to the patterns of use) for purposes of desk storage of the very frequently used equipment. Adjustability of the drawing base, consequently, is not required as this tends to drop off equipment from the drawing base.

Some group meetings involve more than a single class-load of participants. Unfortunately the more private backyard where categorical group activities and discussions may take place without interrupting the rest, is poorly accessed, narrow and traversed by drying lines.

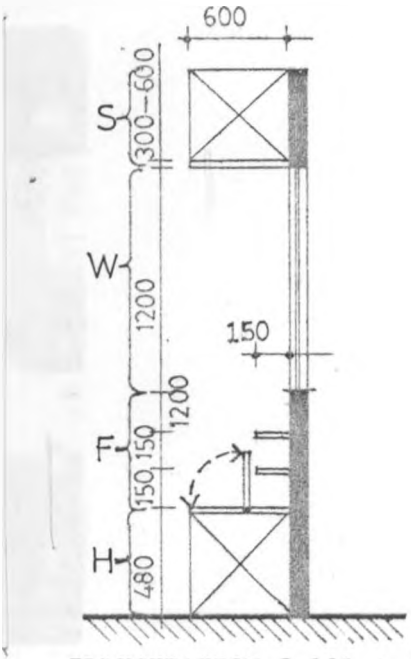
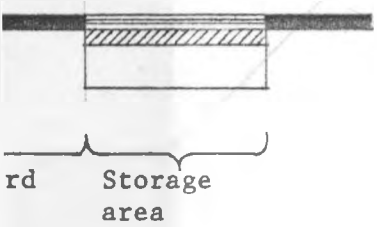


ILLUSTRATION 5.131 A (h)

Plate 5.131 A (g) shows how the wider materials do not fit in the open racks provided. Moreover, the shelves are too deep for the frequently used items (pencils, colours, brushes etc.) and distant from the workstations. The interesting thing is that the top of the racks' unit is in line with the botton line of the window. This ensures that light and views are not cut out by storage wherever the racks' unit is placed. Illustration 5.131 A (h) shows how the different kinds of storage may be catered for without compromising the necessary window height S denotes storage of wide, infrequently used materials e.g. student project work, W is the window (minimum height 2100mm), F denotes the storage zone of the very frequently used items (pencils, colours, brushes) and H, the zone of frequently used wide items e.g. carton boxes the top shelf to this is hinged to facilitate shorter reaching distances to the extreme corners of storage.



A (k)

Sketch plan 5.131 A (k) gives an example of good utilization of the peripheral wall for storage and display purposes. The facilities are not tucked in a corner, but distributed along the peripheral wall for easy access.

c) : PREVAILING MORPHOLOGY TYPES AND NEEDS

As seen in plate 5.131 A (1) the surfaces of the Art space here are flat and not characteristic of a Visual Arts space. Worse still, the potential roof beam suspension points which offer display points at various points of the work area, give the impression of a garage or store. Such morphological elements ought to be modulated and co-ordinated so as to give the space an aesthetic identity. Pin-up boards for two-dimensional art work, alcoves and niches for three-dimensional artwork, are strong morphological elements of a Visual Arts space.

The back of the Art room, normally used for modelling, curving and sketching, is partly covered and suitable for such under-shade/sunshine activities. Unfortunately this is a circulation route to the drying lines. ´See Plate 5.131 A (m).

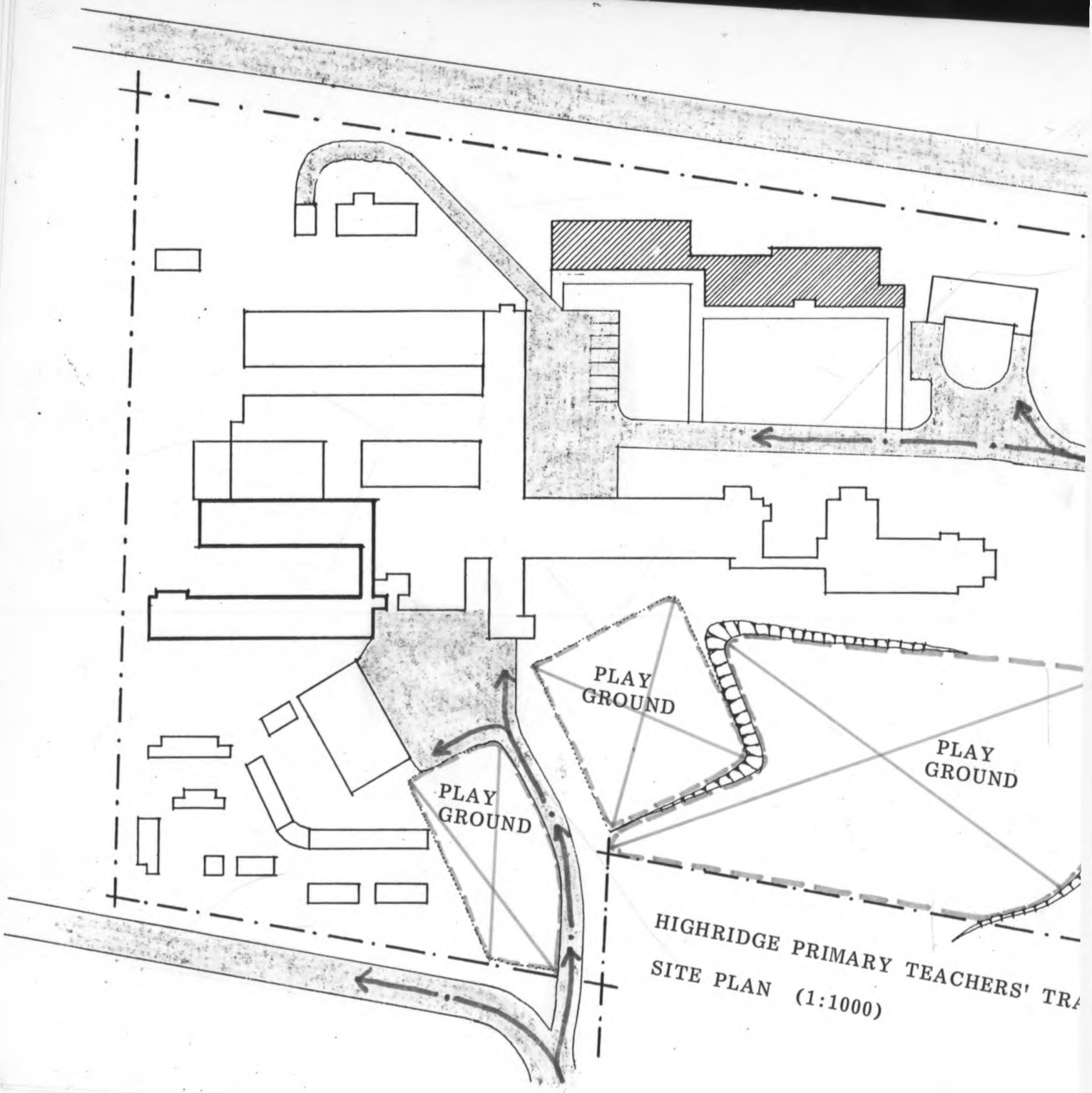
5.131 B - PERFORMING ARTS SPACE TYPES USED

The only space type provided for performing Arts in the institution is the Music room. Physical Education activities are catered for by only three small play grounds (see plan of the institution on opposite page). Thus, only the space type for music is considered.

a) PREVAILING ORGANISATION PATTERNS AND NEEDS OF THE MUSIC SPACE TYPE

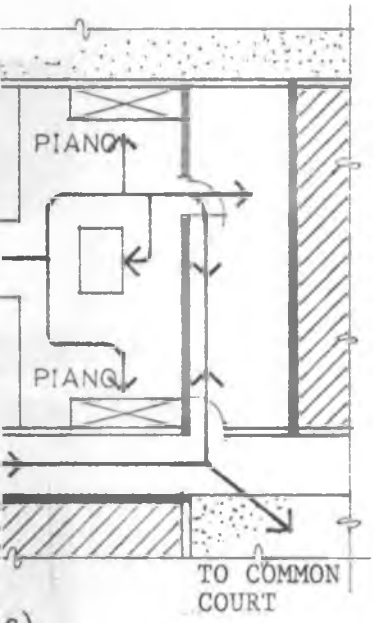
As seen in plate 5.131 B (a), the Music room is stuffed at the bottom corner of a three-storey tution block with formal classroom spaces above. This no doubt interferes with the formal classroom proceedings in the spaces above. In addition, the adjacent open court is poorly accessed and lacks the necessary autonomy and privacy from the unrelated formal classroom activities (see over-looking window openings of surrounding classrooms). Thus, the external activities like improvisation of music instruments and costumes, playing of music instruments and dancing, are preferably done at the playgrounds for autonomy and privacy.

Plate 5.131 B (b) shows the entry way to the Music room not any different from that to a maintenance and repair workshop. Such a space is a potential exhibition and display area for the improvised Music artefacts.



HIGHRIDGE PRIMARY TEACHERS' TRA

SITE PLAN (1:1000)



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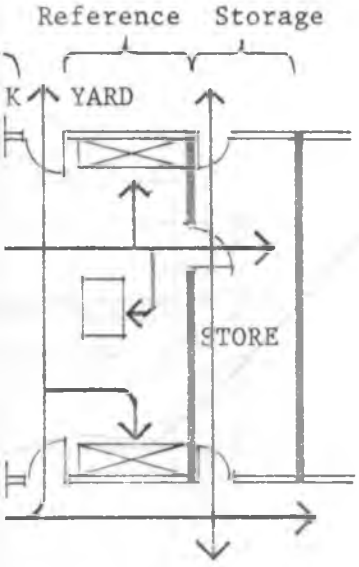

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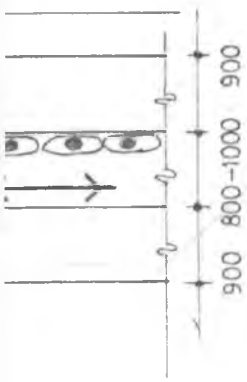
Sketch 5.131 B (c) illustrates the use of long tables to form a peninsular layout. The link to common court is indirect and weak while the backyard to the Music room is under-utilized. Though the use of long tables reduces the outward movement of furniture by students, it is a major hinderance to the metabolic and spontaneous group arrangements of the current Primary Teacher Music activities. The current Music activities involve : classification of Kenyan musical instruments, making of various percussion instruments, display/exhibition of the instruments made, learning to play the instruments made, listening, singing, dancing and the identification of and analysis of the different local and foreign types of music.

Example 5.131 B (d) shows the three main parts of the Music space type used and how these may be conveniently and effectively related to the backyard and common court. The layout may be oriented or focussed to the backyard, (1), to the reference point, (2), or to the common court, (3),(for exhibition and display). The need for spillover activities from the student activity area to the open courts is catered for by collapsible transparent screens.

b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

Plate 5.131 B (e) shows the current use of long tables at the students activity area. The tables take a maximum of five users with a corresponding length x depth space of 600 x 900mm. Deep or wide surfaces are preferred for placement of the usually long percussion instruments (see drums on the worktables in the background of plate 5.131 B (e).

According to the current patterns of use, sketch plan 5.131 B (f) gives the worktable dimensions and the coresponding space clearances around them Though in this case the two-way primary passage way and the one-way secondary passage way have adequate clearances, the long tables are a limitation to dimensional co-ordination in the formation of alternative layouts. In other words there are fewer ways of economically laying out long tables than shorter table units.



The Music teaching space has a total area of $84m^2$ and adequately caters for 50 users with $1.7m^2$ as area per user. Unfortunately two or more classes are occasionally needed leading to redundance of the teaching space and consequent engagement of the more open play grounds. It is therefore essential than open spaces be adjacent and linked to the teaching space to cater for groups involving more than

one class of users.

c) : PREVAILING SPACE MORPHOLOGY TYPES AND NEEDS

The Music room is actually a selected general classroom close to the dining room with larger tables for placement of musical artefacts. Music is a social art and thus needs not be confined to a controlled formal enclosure. An additional, more informal external environment is necessary for informal group and individual practice.

SPACE FOR
DIFFERENT
NRELATED
IVITIES

32 (a)

5.132 : THE CRAFTS SPACE TYPE USED

The learning resource centre (for micro-teaching), is also used for wood and metal work. Plate 5.132 (a) shows two completed drawers on two of the tables.

The use of one space by two different and unrelated activities leads to organisational stress (see Plate 5.132 (a) and conflicts in storage space.

Plate 5.132 (b) show well organised wall, shelf and floor storage of wood and metal work equipment. Unfortunately this was designed for storage of teaching materials and aids.

5.20 : CASE STUDY II

° THOGOTO PRIMARY TEACHERS' TRAINING COLLEGE - KIKUYU

5.21 : CONTEXTUAL INFORMATION

a) Location and Access

The institution is located in a spaceous rural setting within an agricultural neighbourhood. It is accessed by a branch road from the Nairobi-Kikuyu road - 24 kilometres from the City Centre.

b) Background Information

Before 1959, the present day College grounds were occupied by Thika High School and the present day Thika High School grounds occupied by the College. Due to probable rivalry between the then Thika Boys High School and Alliance Boys' High School, the boys' Secondary School was shifted to Thika and the Teachers' College brought to Thogoto in 1959. The Sponsor is the Presbyterian Church of East Africa and the present College capacity is 500 male students and 370 female students.

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Stores

c) : LAYOUT

i) Organisation

There is only one entrance with the learning spaces deep into the site. The formal court (Quadrangle-as it is called) is defined by the administration block, classrooms and the home-science rooms. Beyond the home-science rooms, the general classrooms and practical learning spaces are mixed.

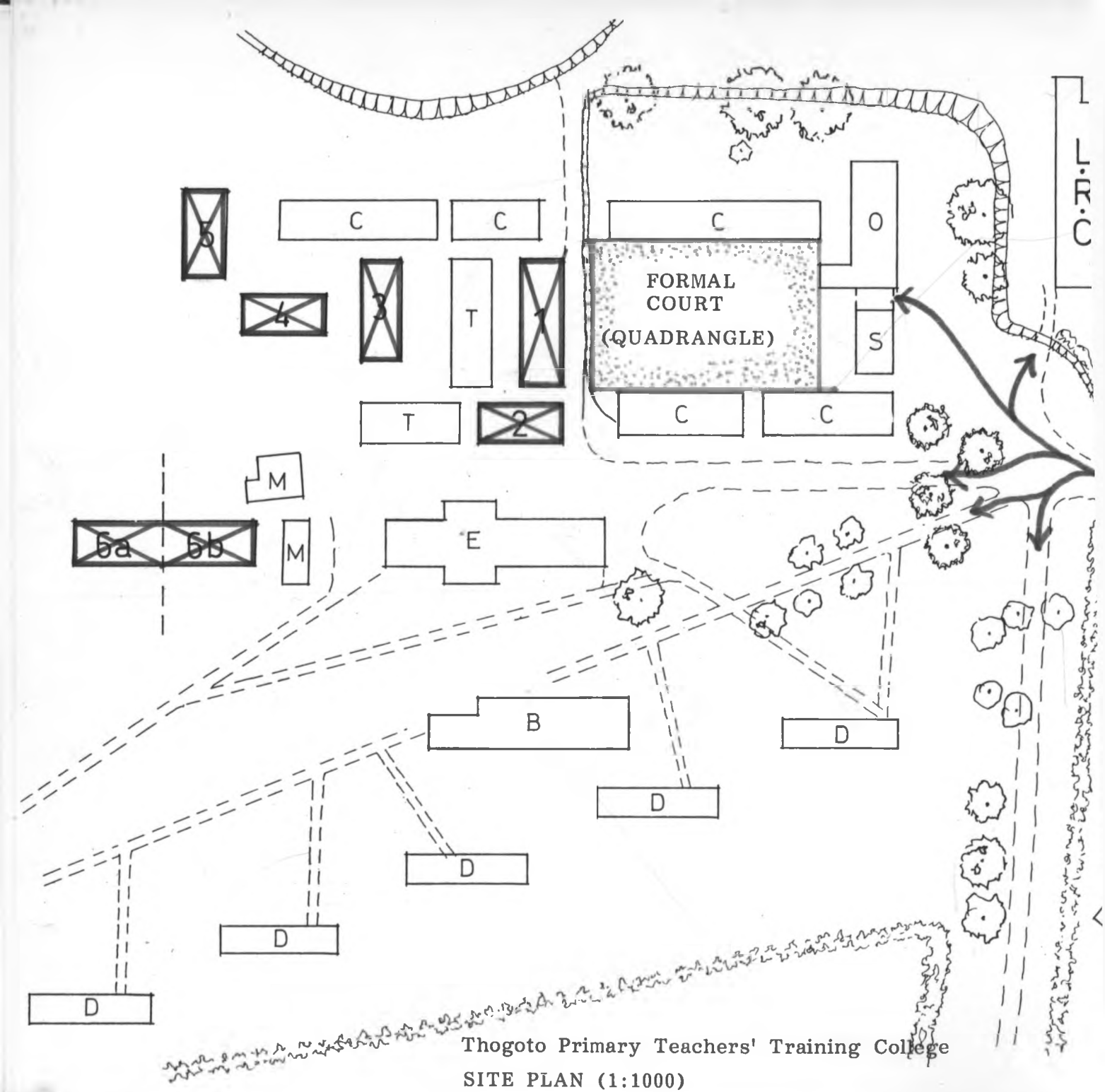
ii) Adequacy

As for Highridge, for each practical learning subject taught, only one learning space is provided. There is normally lack of alternative utility when such a space is in service, repair, cleansing or preparation.

The practical learning spaces here are not directly accessible by vehicular traffic.

iii) Morphology

Due to the adhoc and infill layout of buildings at the back of the Quadrangle, there is no clear differentiation by mass or form between the general classrooms and the practical learning spaces.



Thogoto Primary Teachers' Training College

SITE PLAN (1:1000)

5.22 : THE SUBJECT AREAS

5.22.1 : GENERAL SCIENCE AND AGRICULTURE SPACE USED

a) PREVAILING SPACE ORGANISATION PATTERNS AND NEEDS

The delicate and infrequently used equipment is kept in a central store (see door S to central store in Plate 5.22.1 (a). The work area, with its island bench units, is free of storage and caters for individual and group activities. It is important to note that gas burners are not provided while the water taps and frequently used equipment are limited to the periphery.

Though the laboratory teaching space is related to an external area for improvisation and agricultural activities, the link (a path) is long and weak (see plate 5.22.1 (b). As suggested before in the case of Highridge, some of the ways of strengthening the link are:-

i) adjacency of teaching space and external area.

ii) relationship of teaching space and external area by external worktops and storage units.

PLATE 5.22.1 (c)

Plate 5.22.1 (c) shows the vertical surfaces of the teaching space virtually devoid of illustrative or display work. This may be attributed to the safety and security of such items in communally used laboratories. Never-the-less, by illustrating demonstrating or exhibiting through lockable cabinets, alcoves or pin-up boards, the illustrative and demonstrative requirements of the primary teacher laboratory space may be met without compromising safety.

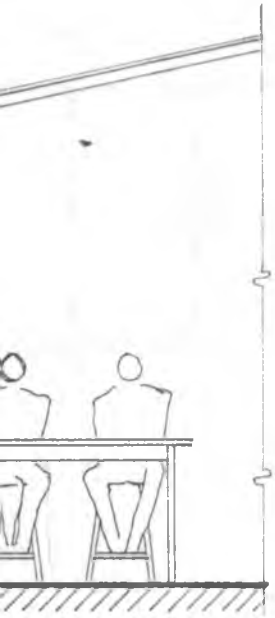
Plate 5.22.1 (d) shows some of the students project work stored in the central storage. This may eventually crowd up the storage space. A convenient place for this type of storage (display type) is above the window top level in lockable, transparent cabinets.

b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

As seen in figure 5.22.1 (e) the actual work-top length x width per user is 750 x 300mm. This width is shallow and only convenient for group work. Most of the individual work is done on the deeper side benches (450mm) or outside the laboratory space.

The teaching space is of total area 100m^2 and adequately accommodates 40 uses (one class). For this case, the area per place is 2.5m^2 (slightly lower than the generally accepted and recommended 2.8m^2/place). However, on certain occassions the laboratory space has had to accommodate up to 80 users, lowering the area per place by half. Such large numbers of users may be catered for on adjacent and accessible open spaces, in lecture and mult-purpose halls.

The critical circulation clearances are those between the work benches and between the work benches and equipment. In figure 5.22.1 (e), the clearance between the work benches (1200mm) and that between the work benches and equipment (1750mm), are within the generally accepted and recommended ranges of 1050 to 1350mm and 1650 to 1950 respectively. However, since the laboratory is characterized by a variety of grouping patterns, the upper clearance limits would best cater for the different patterns without compromising safety and convenience.



Tedious work like classification of living things (insects), microscope/lens work etc. are conveniently done on the side bench. This has a work surface lower than the normal bench height (see sketch 5.22.1 (f).

According to the current patterns of use, the stool used at the work benches (650mm high) is also convenient for the bench. When not needed, the stool is placed below the worktop - leaving room for standing.

The external space adjacent to the teaching space is normally used for improvisation activities. This space, however, is narrow and crowds up when in use.

c) : PREVAILING SPACE MORPHOLOGY TYPE(S) AND NEEDS

The proportions of the learning space are 1:1½. Though this is within the generally accepted and recommended limits for audio and visual communication between the students and teachers, the best proportions for these are 1:1 (5.22.1 (g)). Rectillinear geometry is very much used here for economy of construction. This geometry, however, has been found to favour the formal rather than the spontaneous and improvisational learning situation intended. Thus, as long as the proportions and continuity of workspaces are retained, the geometry may not be rectillinear.

Plate 5.22.1 (g) shows an example of a full-scale student project work. Some of these are functional and may be used in place of the conventional equipment. This calls for the use of a yard where the bulky, improvised materials are stored and used. The unused side of the laboratory space (figure 5.22.1 (g)) is convenient for these activities by use of external storage niches, cabinet or shelves.

5.22.2 : HOME SCIENCE SPACE TYPE USED

a) PREVAILING SPACE ORGANISATION PATTERNS AND NEEDS

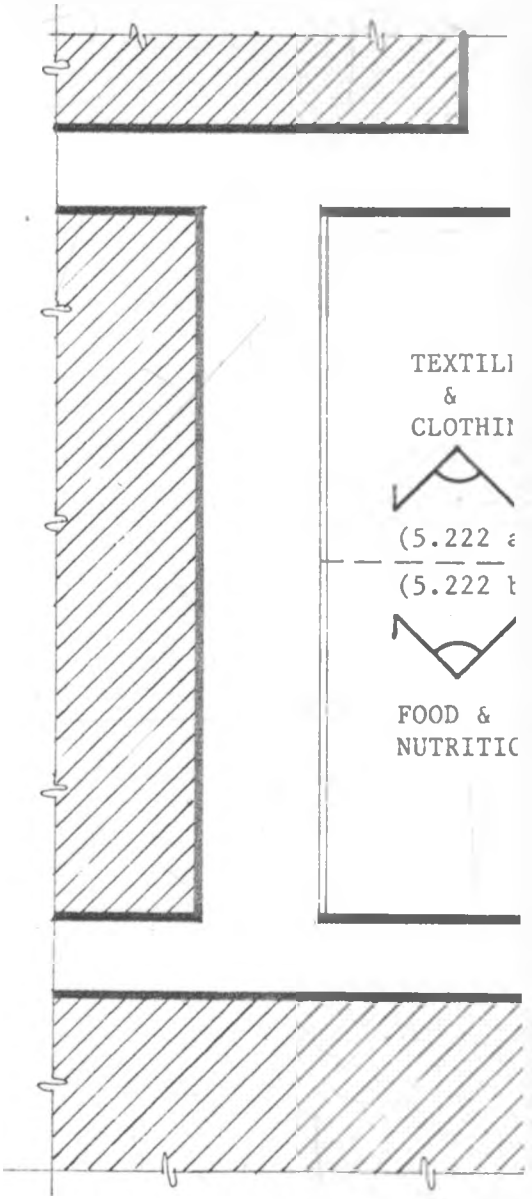
Two distinct zones of activity can be identified in the Home Science space type used here:-

i) the Foods and Nutrition zone (Plate 5.22.2 (a))

ii) the textiles, clothing of laundry zone (Plate 5.22.2 (b)).

Despite the associated problem of acoustic privacy, there is a strong attempt to differentiate without isolating the component activity areas. Family living (the Home) around which revolve the Home Science activities is absent and its activities are done theoritically. Ideally, there ought to be a house/home where family living activities are actually learnt.

With service and practice areas along, the periphery, the work or preparation area is capable of accommodating a variety of alternative layouts. In plate 5.22.2 (a), the preparation area tables are used to define the two spaces.


TEXTILI
&
CLOTHII
(5.222 a
(5.222 b
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NUTRITIC

The front end of the teaching space is normally used for the drying and airing of clothes and textiles. Surprisingly there are no door openings to this end. Worse still, the open space is a public one (Quadrangle) and thus more suitable for exhibition and display work (completed) rather than the sessional work (incomplete) - see plate 5.22.2 (c).

Improper mounting!

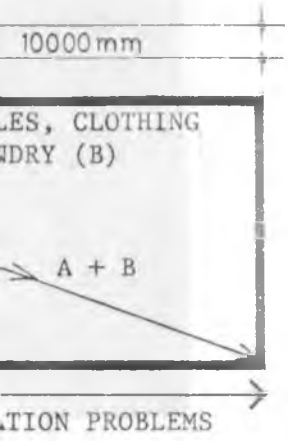
The rear end is actually a circulation route to the teaching spaces and external storage units. Apart from the narrowness of the space and the circulation routes, this is an appropriate space for external activities like the drying and airing of clothes and textiles (see plate 5.22.2 (b). Gradation from the internal environment to a partly covered environment (under shade drying) then to a totally open environment (sun drying and washing) would enhance the convenience and effeciency of such a space.

b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

The single table unit (700 x 750mm) is adequate for a single user but the current utilization patterns emphasize group discussion. The tables are thus used in series according to the necessary grouping patterns (see plate 5.22.2 (e).

Due to the spontaneity of grouping patterns in the Home Science preparation area, the reliable regulatory space adequacy factor here is the area per place and not the clearances. Table 5.22.2 (f) gives the generally accepted and recommended average area per place against the measured average area per place. This demonstrates how the use of smaller table untis (700 x 750mm instead of 1000 x 1000mm) helps reduce the average area per place by one third. Smaller table units are preferred because they can be used for both individual and group work.

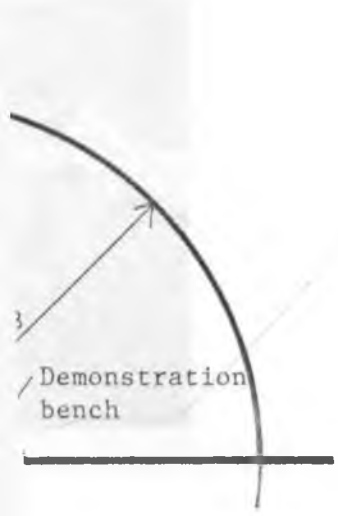
MEASURED AVERAGE AREA
$1.875m^2$



c) : PREVAILING SPACE MORPHOLOGY TYPES AND NEEDS

The Foods and Nutrition zones of activity (A) and the Textiles, Clothing and Laundry zones (B) have space proportions 1:1:43. When combined (A & B), the proportions are stretched to 1:2:86 with resultant audio and visual communication problems to the occupants at the back. See figure 5.22.2 (g).

Figure 5.22.2 (h) illustrates the space proportions where the isolated spaces (A and B) may be combined without interfering with the necessary distance from the demonstration bench.



5.23 : ARTS AND CRAFTS SUBJECT AREA

5.231 A - VISUAL ARTS SPACE TYPE USED

a) PREVAILING ORGANISATION PATTERNS AND NEEDS

The furniture movement evident in plate 5.231 A (a) is characteristic of varying furniture layouts during the learning sessions. The Visual Arts space is actually used by more than one single group of users with the need for both individual and communal or group work space. The large tables of the teaching space do not cope with the variable grouping patterns and these are being replaced by smaller, more convenient tables.

Due to communal use of the worktables (Plate 5.231 A (a), the cabinets below the tables are virtually under-utilized. Open racks for the frequently used equipment are more convenient here.

Plate 5.231 A (b) shows some of the materials in the store marked "S" in plate 5.231 A (a) above. The separation of paper storage from the bulk storage e.g. paint is very evident. However, it is unfortunate that the student project work (2-dimensional and 3-dimensional) is mixed with its raw materials.

b) : PREVAILING SPACE ADEQUACY SITUATION AND NEEDS

Extra users

Sketch 5.231 A (c) illustrates the current use of large tables at the work places. The kneehole spaces on only two sides of the tables indicate that the tables are ment for only two users. Surprisingly, the tables are used by four users (the two extra kneehole spaces created by opening up the cabinets below). The resultant individual workspace length X depth becomes 700 x 700mm for a corresponding drawing paper size of 594 x 420mm (A2).

Plate 5.231 A (d) shows a crowded peripheral storage shelf and space below the self for the less frequently used bulk storage. A table (in foreground) is used to supplement the in adequate shelf.

In addition to the shelf at the worktop height, there is need for shelves all round to a height of 1800mm (limit of convenient vertical reach). The shelves above 1800mm is best for the light and infrequently moved storage e.g. the students' project work.

c) : PREVAILING MORPHOLOGY TYPES AND NEEDS

Plate 5.231 A (e) gives the Visual Arts space type used. The back elevation has window openings to the store and not the work area while the front elevation has window openings to the work area and not the store. As a result, the back of the Art space is visually cut off from the work area and is actually a dead space. This is otherwise a potential space for:

i) semi-enclosed verandah space activities like modelling;

ii) open space for outdoor activities like sculpture, sketching etc.

The paintings on the wall of the Visual Arts space illustrate that despite the introverted nature of the building, the works of art still spill to the exterior surfaces.

CHAPTER

6

• COMMENTS RECOMMENDATIONS & CONCLUSIONS

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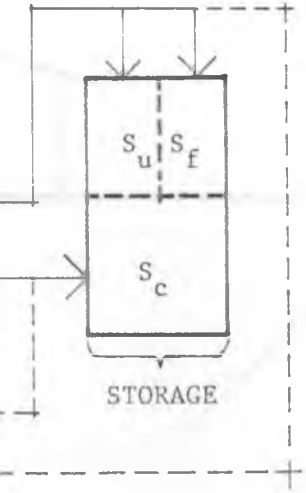


6.10 : C O M M E N T S

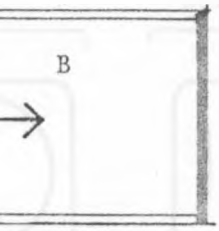
6.11 : ACTIVITIES, SEQUENCES AND PROVISIONS

Most of the activities are group-based, the individual work being mainly student project work (see table 6.11). Work is first discussed in groups after which the individual work (student projects) follows. The student project work is done inside or outside the teaching space.

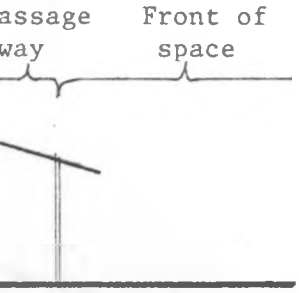
Generally, the provisions are inadequate. These consist of mainly standard prototype buildings and some ready made equipment. Since most primary schools cannot afford sufficiency in ready made equipment, emphasis is laid on the ability of the student teacher to improvise equipment.

6.12 : PREVAILING SPACE ORGANISATION TYPES

In figure 6.12, the continous lines represent the strong existing links while the dotted lines represent weak existing links or the absent necessary links. S_u, S_f and S_c denote the unfinished work store, the finished work store and the central store respectively. The external display, exhibition and practice area are weakly linked and sometimes absent while the different storage zones are not clearly differentiated.



type (THOGOTO)



6.13 : PREVAILING SPACE ADEQUACY TYPES

As seen before, the Home Science teaching space (THOGOTO) may be used differently and singly by two class loads of users (6.13). If separated the duality in space use is lost.

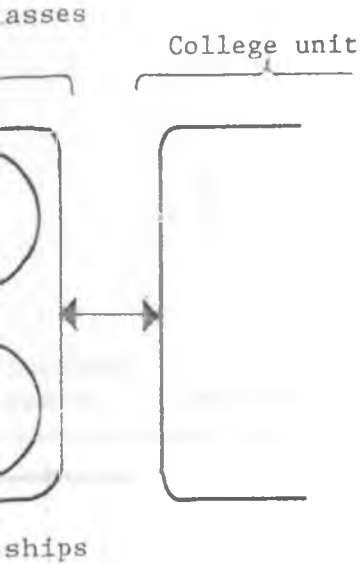
Occassionally, large groups involving more than two class loads are catered for in open fields, under-shade.

6.14 : PREVAILING SPACE MORPHOLOGY TYPES

A typical form with circulation passage way on one side and a poorly accessed backyard is used (see sketch 6.14). Changes in level have not been used to the advantage of the different activity types and there is no gradation between the internal and external environment at the backyard.

6.15 : PREVAILING LINK TYPES

Covered passageways around open courts are mainly used. Not much attention is paid to the nodes of these passageways as they sometimes meet at the side of a teaching space. The activities linked by the court are sometimes very different and unrelated.

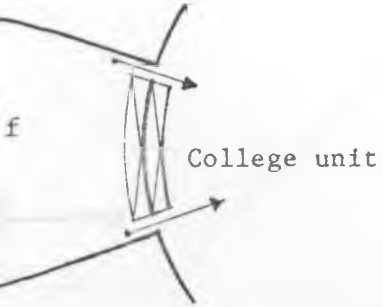


6.20 : RECOMMENDATIONS

Since emphasis is on the student teacher's ability to improvise equipment and contrive learning opportunities, time and space are crucial. More time should be given to the teaching and learning of practical subjects and a strong relationship in between the internal and external learning environments should be sought for purposes of maximum usable space for minimal built area.

6.21 : SPACE ORGANISATION

The organisational units range from the individual student workstation to the communal inter-college work/ exhibition space (see illustration 6.21 a). Space organisation that reflects and enhances this relationship is recommended (see illustration 6.21 b). The communal inter-college work/exhibition area ties up all the practical learning spaces. Storage units should be used to visually and acoustically screen zones of privacy.



b.

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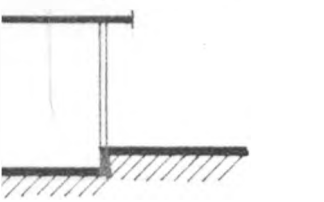

evels of enclosure

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6.22 : SPACE ADEQUACY

The necessary areas, clearances and heights have already been discussed in the previous chapters. For continual adequacy, however, the teaching space must be capable of extension and make maximum use of adjacent external spaces.

6.23 : SPACE MORPHOLOGY

Except for audio and visual privacy reasons, changes of level should be used to the benefit of the different activity types rather than solid insulative screens. There should be a gradation of enclosure from the internal to the external environment (i.e. enclosed, semi-enclosed and open - see sketch 6.23).

6.24 : LINK TYPE

Covered passageways around open courts are among the best ways of linking the practical learning spaces. These link and at the same time separate different related spaces. The nodes to the passageways (see figure 6.24) should be articulated for illustrative displays and gatherings. And the activities linked by the court must be related or otherwise the court space usage may be abused.

6.30 : CONCLUSIONS

The current established and old Primary Teachers' College in Kenya have actually grown out of other learning institutions. They were not, as such, designed to be the Colleges they ought to be;but the learning activities were allocated to the space types available. The Colleges, thus, became academies - where the idea was to acquire professional teaching knowledge rather than the related skills.

In response to the Primary Education Project objectives, an attempt has been made to rehabilitate the old Colleges,but this has turned out to be an inclusion of prototype buildings rather than an integration of learning environments. Rehabilitation is not the best way to solve the problem of the lack of places for practical learning; but despite the cost factor, the best possible way to alleviate the problem is to design new, more integral learning environments for Primary Teachers that will respond to the current needs.

7

EPILOGUE

The space requirements and needs of practical oriented learning activities cannot be prudently catered for in full detail as some of the specific needs are subjective.

The research findings, as such, are not presumed to dictate the space requirements and needs, but may be useful guidelines to the design of such tasks in new Primary Teachers' Training Colleges or the rehabilitation of the old Primary Teachers' Training Colleges in Kenya.

The research finding are also aimed at evoking further research in the field of practical oriented learning so as to enable the evolution of spaces from the corresponding needs and requirements rather than from general needs and requirements.

8

APPENDIX

Space Organisation*

This is the relationship between different spaces and is mainly realized through the placement of furniture and equipment. The organisation may be centralized, linear, radial, clustered, grid on any combination of the above.

Space Adequacy*

For an optimum working environment certain dimensional requirements and needs are crucial. Working areas, heights, reaching distances and circulation clearances.

Space morphology*

This is the form of the space resulting from the configuration of the space defining elements i.e. proportions and relief.

IBRD*

International Board of Research and Development.

9

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