# 5. Furniture & Equipment

**(a) Why Costs are High**

Practical subjects also need specialised furniture & equipment:

- *Home Economics*: cupboards, cookers, refrigerators, kitchen equipment and utensils.
- *Needlework/Tailoring*: sewing machines, clothes-making accessories.
- *Woodwork*: benches, vices, saws, hammers, chisels, etc..
- *Metalwork*: benches, vices, lathes, hand and power tools.
- *Agricultural Science*: agricultural machinery and tools.
- *Commercial Subjects*: computers, typewriters, calculators.
- *Technical Drawing*: drawing boards and instruments.

In many countries, most of these items have to be imported. And even when locally made materials are available, imported goods often have higher prestige. Schools sometimes find that a desire for prestige forces them to buy equipment that cannot be justified on other grounds.

In addition, many schools in developing countries are too remote to have mains electricity supplies. They therefore need their own generators which, if they are to run metalwork and other machinery, must be quite powerful. And even when schools do have mains electricity, many find that they need (a) power stabilisers to protect computers and other expensive equipment from surges, and (b) stand-by generators for use during power cuts.

A further problem is that technologies often develop rapidly, so that schools find that their equipment is out of date. Schools with computers, for example, have found this a major problem.

Schools often find that they need special vehicles, e.g. to carry agricultural produce or items made in metalwork shops. In many countries, these vehicles also need to be imported.

Finally, because equipment is costly, schools must take precautions against theft and accidental damage. All buildings require strong locks and fire-fighting equipment, etc..

***The Costs of Equipment in Different Subjects***

*A 1982 analysis of unit costs in Trinidad & Tobago led to the following estimates of annual equipment costs per student (amortised and expressed in US$):*

| | |
|---|---|
| *Machine & Metals* | *40.0* |
| *Automechanics* | *37.3* |
| *Carpentry & Joinery* | *23.3* |
| *Electrical* | *20.6* |
| *Home Economics* | *20.0* |
| *Business Studies* | *18.6* |
| *Agric. Science* | *17.3* |
| *Masonry* | *12.6* |
| *Technical Drawing* | *8.0* |

*As the table shows, equipment costs in machine & metals were five times as high as those in technical drawing. Technical drawing also had the lowest building cost per student (see Chapter 4). The subject with the highest combined building and equipment cost was home economics.*

### (b) How Cost-Effectiveness can be Improved

Because buildings and equipment go together, many of the points raised in Chapter 4 are also applicable here:

* Schools can try to use furniture and equipment for different purposes, e.g. benches for both woodwork and metalwork, gas for both laboratories and general kitchens, etc..
* Locally made equipment can be used wherever possible — perhaps constructed in the school itself.
* Schools can try to share resources.
* The curriculum can be adapted to focus on topics that do not require costly equipment.
* Equipment that is only needed occasionally can be (i) shared between schools or (ii) borrowed or hired from commercial

enterprises. Hiring may also be desirable when equipment needs frequent servicing, and when it is likely to become rapidly outdated.

*Furniture*

Traditional, large, heavy fixed benches are not recommended. They are costly to construct, consume a great deal of material, and the drawers and cupboards which are commonly made part of the construction are rarely used for the purposes for which they were designed. Once in position, the benches remain there for ever.

Instead, benches should reflect the flexible demands of different needs. They should be easily movable, so that they can be cleared away and joined together as desired. A useful dimension is 5 feet (1.5 metres), which allows two students to sit side by side. An edge overhang of three inches (7.5 cms) permits easy use of edge clamps.

Instead of a fixed demonstration bench, a trolley bench or cart can carry apparatus, materials and water. The trolley can be loaded from a central storeroom or cupboard, and then moved into position between benches. Figure 5.1 shows a picture of one.

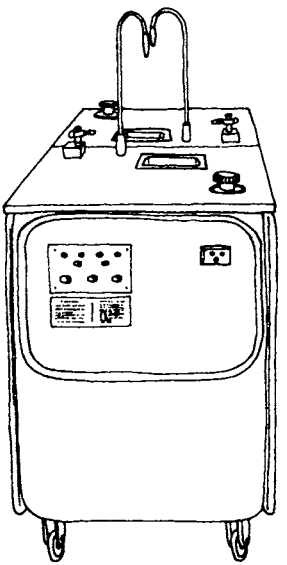

*Figure 5.1: A Movable Trolley to Carry Water, Gas and Materials*

*Storage*

Many schools suffer severe storage problems. Unsuitable layouts waste space and cause costly breakages.

The best storerooms avoid expensive adjustable shelving but do have a variety of different shelf widths and heights. Heavy items are stored at low levels, and corrosive substances are stored in their containers in a bed of sand at floor level. There are separate areas for storing tools, equipment, raw materials, and products. Often it is desirable to store dangerous equipment and materials separately.

The total storage area should generally be not less than one fifth of the workshop or practical area.

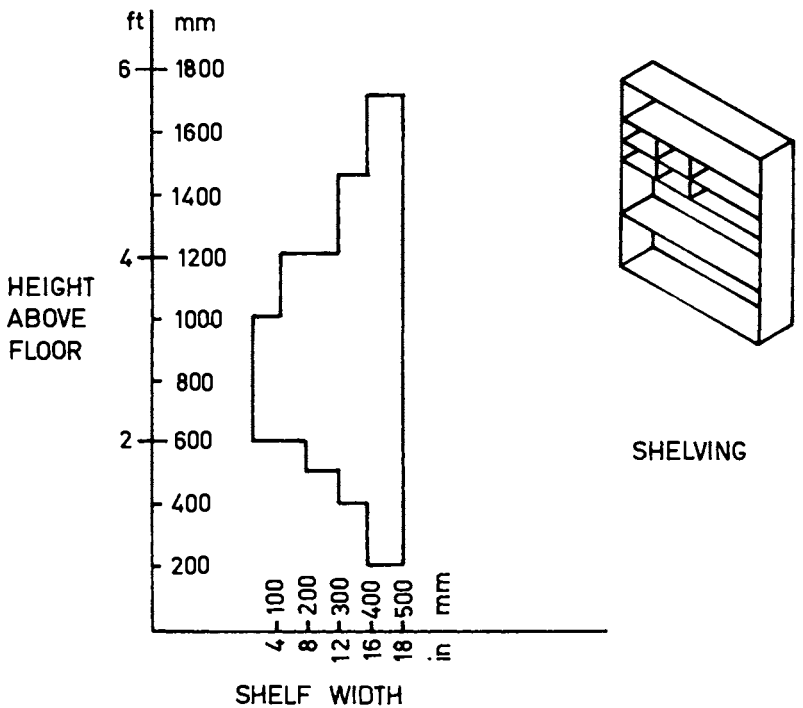


*Figure 5.2: A Recommended Design for Storage Shelves*