Section 2

EDUCATIONAL EQUIPMENT PRODUCTION CENTRES

In 1979 the author, under contract to the British Council, carried out a limited survey using the network of British Council offices, and a Draft Directory of Educational Equipment Production Centres was published, primarily for use by the British Council offices.

Feedback from this initial publication has indicated that a wider distribution of such information would be desirable as a means to encourage correspondence between units concerned with the development of equipment. The British Council have given permission for material from their original publication to be used in this publication. The material has been updated from feedback obtained and is presented country by country for ease of future updating as more information becomes available.

Country Profiles

In most cases equipment production centres have started by producing apparatus for science and mathematics. Some units have concentrated only on apparatus and equipment for these subjects while other units have expanded to include other disciplines. Some units have been established as independent operations while others have been closely allied to curriculum development activities. All units produce prototypes but not all are concerned with producing items in bulk. Very few units are concerned with repair and maintenance of equipment although this area is now receiving greater attention by many countries, and by donor agencies.

The country profiles are listed alphabetically, some countries having more than one unit. Private/commercial operations are not included, although a number exist who work closely with curriculum development groups and/or ministries of education.

The comments included have been added where additional fringe information might be relevant, or where a direct contact address is known for a group interested in the provision of equipment, but where a centre as such does not yet exist.

AFGHANISTAN

Address	National Science Centre, Ministry of Education, Kabul.
Level	Secondary education.
Production	The Centre produces prototypes, and manufactures the finished articles for distribution. The items produced are related to science and mathematics and are produced in the form of kits and individually. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Centre organises in-service training courses for teachers, and courses of training for laboratory assistants.
Maintenance	Facilities and services for equipment, repair and maintenance are available as well as training courses.
Brief History	The Centre was established in 1972 with assistance from UNDP/ UNESCO. It has a triple function: curriculum development and production of written material in connection therewith; design and production of equipment; and training courses related to the above.
Comments	The Centre has a staff of some 50 people plus two supervisors in each of the Provinces of Afghanistan. On the same compound as the Science Centre is an Audio-Visual Aids Centre which also produces a kit of apparatus for science and mathematics for primary schools. In 1977 the Ministry of Education established a Science Technician Training School with the Science Centre having the initial responsibility for the curriculum and teaching.

ALGERIA

There is no Ministry of Education production unit for school materials (e.g. rulers, pens, pencils, ink), which are either imported or produced locally by a number of state industries. Notebooks, pens, rulers etc, must be purchased by the student from normal retail outlets.

Printed materials and school texts are produced by curriculum development teams working at the Institut National Pédagogique, and are printed by the Ministry of Education Press. Materials are distributed by the education departments of each region.

Foreign texts and software tapes, taped courses etc, are imported by SNED (Société Nationale d'Edition et de Diffusion), 49 rue Larbi Ben M'Hidi, Algiers.

ARGENTINA

There are no known national educational equipment centres in Argentina, although there are some projects in which equipment is produced principally for the producer but other institutions may also benefit.

Address — Instituto 'Louis A Huergo', Peru 753, 1068 Bueones Aires.

Comments — This is a private school dealing with children at the primary and secondary level. It produces its own equipment, particularly physics apparatus. It is believed that some discussions have taken place with UNESCO regarding a wider distribution of this equipment.

Address — Formacion de un Laboratorio para la, Ensenunza de la ciencias, Av Madero 235, 1106 Bueones Aires, (Attn Professor A Santini).

Comments — This is an Organisation of American States (OAS) project to produce low-cost equipment for primary and secondary schools.

AUSTRALIA

Equipment is normally obtained from commercial suppliers by individual institutions although the pattern varies from state to state.

A National Centre for Curriculum and Material Development exists; for further information contact: The Director, Curriculum Development Centre, PO Box 826, Woden, ACT 2606.

Contact could also be made with: The Director of Education, South Australian Department of Education, Adelaide.

BAHRAIN

Information related to local production is not currently available. For specific details contact: Ministry of Education, PO Box 43, Manama, (Attn Under-Secretary for Education).

BANGLADESH

Address	Bangladesh Educational Equipment Development Bureau, Dhaka Polytechnic Institute Building, Tejgaon Industrial Area, Dhaka 8.
Level	Primary, secondary and higher secondary education.
Production	The Bureau produces prototypes, and contracts production out to local manufacturers. Items for science and general educational equipment for a number of disciplines are produced individually. They are distributed to recommended schools and colleges for trial and evaluation.
Training	The Bureau participates in in-service teacher training courses in the use and maintenance of educational equipment.
Maintenance	Facilities and services for equipment, repair and maintenance are not yet available.
Brief History	In 1966 the Government with assistance from the Ford Foundation established the Bureau, under the administrative control of the Directorate of Technical Education. Initially the Bureau was concerned with equipment for secondary and higher secondary education. In 1976 this was extended to include the primary level as well. The Bureau develops prototypes and provides working drawings to local manufacturers, and provides quality control and advisory services for the items produced.
Comments	During the 1980-85 Plan period the Government proposes to reorganise the Bureau into an Educational Equipment Board as a department of the Ministry of Education - the Board having responsibility for all aspects of equipment provision to the educational institutions of the country. The reorganisation and development of the Board's activities will be partly financed through a loan from the Asian Development Bank.

BARBADOS

A regional activity related to the Caribbean Regional Science Project is concerned with equipment. Contact could be made with: The Director, School of Education, University of the West Indies, Cave Hill.

BOTSWANA

Address	Teaching Aids Production Unit (TAPU), PO Box 696, Francistown.
Level	Primary education.
Production	The Unit produces prototypes and manufactures finished articles for distribution. The items produced are general education equipment for various disciplines and are in the form of kits and individual items. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit participates in in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The Unit was established by the government in 1970, with assistance from DANIDA and UNICEF.
Comments	The 'Brigades' movement of the Ministry of Education also produces some items of school equipment for sale to individual schools. For further details of this activity contact: The Ministry of Education, BRIDEC, P. Bag 0062, Gaborone.

BRAZIL

Address	Centro de Technologias Educacionais, Secretaria de Educacao e Cultera, Rua do Passeio, 62-4^{o} andar, Rio de Janeiro.
Level	Pre-primary, primary and secondary education.
Production	The Centre designs prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines and are in the form of kits and individual items. They are ordered by the Secretariat of Education and distributed to all relevant institutions.
Training	The Centre participates in in-service training courses for teachers.
Maintenance	Facilities and services for equipment, repair and maintenance are not yet available.
Brief History	The Centre commenced operation in 1975 when the Secretariat of Education was re-organised to meet the needs which arose from the merger of the states of Guanabara and Rio de Janeiro.

Comments — This is an example of a State Centre. A number of State Centres came into existence from the stimulus of FUNBEC (see below) and the need for de-centralisation.

Address — FUNBEC, Cidade Universitaria, Caixa Postale 2089, Sao Paulo.

Level — Primary, secondary and tertiary education.

Production — The Foundation produces prototypes and manufactures the finished articles for distribution. The items produced are related to science, mathematics, technical and medical education, and are in the form of kits and individual items. They are obtained by direct purchase by individual schools, individuals, and by the Secretariat of Education for distribution to their schools.

Training — The Foundation participates in design, development and production only.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — In 1946 IBECC (Instituto Brasileno de Educacion, Ciencia y Cultura) was established to co-ordinate and support activities in education, science and culture. A group of professors at the University of Sao Paulo were concerned about the teaching of science and attempted to produce kits for practical science learning at home. This activity was eventually supported by IBECC, and FUNBEC (Foundation Brasiliana para el Desarrolla de la Ensenanza de los Ciencias) was formalised in 1967.

Comments — From initially providing simple kits FUNBEC now covers the range from kits to electro-cardiographs and other sophisticated equipment. For further details the reader is directed to the UNESCO publication New Trends in School Science Equipment.

Address — Projeto Multinacional de Tecnologia Educacional, Centro de Brasil, Rua de Imprensa, 16-9° andar, Rio de Janeiro.

Level — Tertiary education.

Production — The Centre designs prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines and are in the form of kits and individual items. They are ordered by Ministries of Education and distributed to all relevant institutions.

Training — The Centre participates in in-service teacher training courses.

Maintenance — Facilities for equipment, repair and maintenance are not yet available.

Brief History — This activity commenced in 1968 primarily as a Centre for Educational Technology. It now concentrates on producing in-service modular training materials in the area of educational technology for use throughout Latin America.

Comments — This regional activity is part of an International Project of the Organisation of American States. Brazil invests considerable sums in education and there are many units producing educational equipment and support materials. These range from the centralised federal bodies (like CEBRACE and FENAME) through state bodies (e.g. Centro de Tecnologia Educational-Brasilia) and state industrial enterprises (e.g. Petrobas) to individual bodies in the private education sector (e.g. Objectivo) and state or private educational foundations (IRDEB, University Departments of Education).

BURMA

Address — Rangoon Arts and Science University, Science Workshop, Rangoon.

Level — Primary, secondary and tertiary education.

Production — The Workshops produces prototypes, and manufactures the finished articles for distribution. The items produced are related to science and mathematics (secondary level) and general educational equipment for various disciplines (primary level). They are produced in the form of kits for primary schools and individual items for secondary schools and are ordered by the Ministry of Education and distributed to all relevant institutions.

Training — The Workshops participate in design, development and production activities only.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — The unit was established in 1964 as a workshop for the maintenance and the repair of equipment for the Physics Department of the University. Since 1968 it has largely concentrated on the production of educational equipment for secondary schools and, since 1976, for primary schools. The workshop has received assistance from UNDP/UNESCO/UNICEF and the Australian Colombo Plan.

CANADA

Equipment is normally obtained from the commercial suppliers by individual institutions although the pattern varies from province to province.

CHILE

Information on activities is not currently available. Contact could be made with: Centro de Perfeccionamiento, Experimentacion y Investigaciones Pedegogicas, Casilla 16162, Correo 9, Providencia, Santiago de Chile.

PEOPLE'S REPUBLIC OF CHINA

China has a long history of producing school equipment. Plans are now in preparation for establishing production units in selected areas of the country to provide modern equipment for the school system, with assistance from UNICEF.

COLOMBIA

Address	Multitaller de Materiales Didacticos, Facultad de Ciencias, Universidad del Valle, Apartado aereo 2188, Cali.
Level	Secondary and tertiary education.
Production	The Multitaller designs prototypes and manufactures the finished articles for distribution. The items are produced for science and mathematics and are in the form of kits as well as sub-kits made up from components in the main kit. They are purchased directly by individual institutions.
Training	The Multitaller operates pre- and in- service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance

are available.

Brief History — The Multitaller was formally established in January 1979 although physics apparatus has been produced at del Valle since 1965 and the glass blowing facilities date back to 1969. The original initiative was from the University but UNESCO assistance has also been provided as well as grants from the Rockefeller Foundation for the purchase of machinery.

Comments — Several universities in Colombia have production of prototypes, usually as part of the pre-service training of secondary school teachers. The Ministry of Education has a curriculum development unit for the primary school level with branches in several places of the country which take care of the in-service training of teachers for primary schools.

COSTA RICA

Address — Centro para el Mejoramiento de la Ensenunza de las Ciencias (CEMEC), Calle Central, Avenida 10, San Jose.

Level — Pre-primary, primary and secondary education.

Production — The Centre designs prototypes only. The items are related to pre-school education and science and mathematics and are produced individually. They are purchased directly by individual institutions.

Training — The Centre participates in in-service teacher training courses.

Maintenance — Facilities and services for equipment, repair and maintenance are not yet available.

Brief History — CEMEC was created in 1977 as a Department of the Ministry of Education. The Centre has a workshop for the development of prototypes for the science curriculum development groups at elementary and secondary education levels (for general science, physics, chemistry, biology).

Comments — There are plans to modernise the existing Centre. The majority of equipment has to be imported, and many schools are inadequately equipped for effective science teaching.

ECUADOR

Information on activities is not currently available. Contact could be made with: Centro de Fisica, Universidad Central de Ecuador, Quito.

EGYPT

Basic educational equipment is produced by many local firms on contract to the Ministry of Education. More advanced equipment is mostly imported. The NAST Pharmaceutical Chemical Co. manufactures desk top science teaching kits, especially for chemistry in the 13 - 15 years range, for the Ministry of Education.

The following centre is concerned with producing pre-primary education equipment: EMBABA Training and Demonstration Centre, 1 El Mahata Street, Imbaba, Cairo.

ETHIOPIA

Address	Educational Material Production and Distribution Agency (EMPDA), Science and Vocational Equipment Centre, Box 5549, Addis Ababa.
Level	Primary and secondary education.
Production	The Agency produces prototypes and manufactures the finished articles for distribution. The items produced are related to science and mathematics and general education and are in the form of kits and individual items. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Agency participates in in-service teacher training courses and courses for laboratory assistants.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The Agency was established in 1979 and receives assistance from UNDP/UNESCO.
Comments	EMPDA also has a school furniture factory, a factory which manufactures chalk, and is establishing a hand tool production unit.

FIJI

Some activity has taken place at the Education Resources Centre, Ministry of Education, Suva. Full details are not currently available.

For regional activities contact could be made with:
Institute of Education, University of the South Pacific, Suva.

THE GAMBIA

Address	Book Production and Material Resource Unit, c/o Department of Education, Bedford Building, Banjul.
Level	Mainly primary but moving into secondary education. Also adult literacy.
Production	The Unit produces mainly textbooks at present. The books produced are related to primary education and adult literacy programmes, and are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit participates in in-service training courses on an 'ad hoc' basis.
Maintenance	Facilities and services for equipment, repair and maintenance are not yet available, but a future expansion of activity is planned to support teacher centres.
Brief History	The Unit originated as the resource centre of the Gambia College but as of 1 July 1979 became reconstituted in its own right. Although starting with printed materials it is expected to expand into development/procurement of educational materials and equipment.

GHANA

Address	Audio-Visual Aids Section, Department of Science Education, University of Science Education, University of Cape Coast, Cape Coast.
Level	Pre-primary, primary, secondary and tertiary education.
Production	The Section designs prototypes only. The items, produced

individually, are general educational equipment for various disciplines. They are purchased directly by individual institutions.

Training — The Section operates pre- and in-service teacher training courses and in-service training courses for laboratory assistants.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — The A-V Aids Section was established in 1968. It has received aid from UNESCO, in the form of equipment and personnel, since 1971.

Comments — There are plans to develop the wood workshop unit into a well established Unit for the Development of Improvised Teaching and Learning Aids (UDILTA). It will not only build prototypes but also manufacture individual items as well as kits.

Address — Council for Scientific Research, Scientific Instrumentation Centre, Accra.

Brief History — This Centre, which is being financed jointly by the Government of Ghana and the UNDP, is in the process of being developed, and one of its activities is to stimulate equipment production. The Centre is expected to provide encouragement to local small industries, facilities for the repair and maintenance of existing scientific and educational instruments, and help to improve the teaching of science and technology in the schools.

Comments — The Centre is designed to provide a service for all levels of science and technology education. Included in its activities is the establishment of a National Standards Bureau.

Previous attempts to establish a Science Equipment Production Unit were made by the Ministry of Education at Accra Polytechnic. This unit was to assemble apparatus from parts made in various technical institutes throughout Ghana, but it did not develop into a viable operation.

Address — School Science Import Substitution Enterprise, c/o Department of Physics, University of Science and Technology, Kumasi.

Level — Secondary education.

Production — The Enterprise produces prototypes and manufactures the finished articles for distribution. The items, which are related to science education, are produced individually. They are purchased directly by individual institutions. The Enterprise participates only in development and production activities.

Maintenance — Repair and maintenance facilities and services are not available.

Brief History — The Enterprise is a private operation started by two technicians at the University in 1970. It has no official status but has the co-operation of the University. Products are designed by staff members and manufactured in the departmental workshops.

Comments — This is a small self-financing operation which sells direct to schools or to the local science equipment agent, who keeps stocks and sells to schools.

GUYANA

Some activities in the equipment field are believed to be taking place in conjunction with the Curriculum Development Unit. Further details are not currently available although contact could be made with: Education Officer (Science), Ministry of Education, 21 Brickdam, Georgetown.

HONG KONG

Address — Hong Kong Association for Science and Mathematics Education, c/o Diocesan Boys' School, Mongkok, Kowloon.

Level — Secondary education.

Production — The Association produces prototypes and manufactures finished articles for distribution. The items produced are related to science and mathematics and are in the form of kits and individual items. They are purchased directly by individual institutions.

Training — The Association participates in in-service teacher training courses.

Maintenance — Facilities and courses for equipment, repair and maintenance are not provided.

Brief History — The Association set up its own equipment group in the summer of 1976 to develop and design low-cost equipment in support of the Integrated Science curriculum. It soon extended its work into large scale production of equipment and into covering other curricula as well.

Comments — For a greater explanation of this unique activity the reader is directed to the UNESCO publication New Trends in School Science Equipment.

Other Organisations

The provision of educational equipment is mainly a commercial undertaking whereby equipment is purchased from manufacturers, suppliers or agents (see above).

Dr R F Simpson of the School of Education, University of Hong Kong, devised and constructed kits of simple physics apparatus and elementary technology kits; these are now commercially available.

In the field of audio-visual aids, the Centre listed below provides facilities for teachers to make apparatus, and provides courses for teachers on a wide range of visual presentation.

Address — Visual Education Centre, Education Department, Lee Gardens, Hysan Avenue, and its Media Production Services Unit, Canton Road, Kowloon.

Comments — This Centre is a section of the Advisory Inspectorate. It exists to provide a variety of centralised audio-visual resource services to schools and colleges, and serves as a central source of information and advice on all practical aspects of audio-visual methods and instruction. The Centre was established in 1957, taking over a library of films and filmstrips built up since 1947. The Hong Kong Polytechnic, The University of Hong Kong and The Chinese University all have Media Resource Centres.

HUNGARY

Address — Fovavosi Pedagogia Intezet, Institut Pedagogic of Budapest, Budapest VIII, Horoath MT8.

Level — Pre-primary, primary and secondary education.

Production — The Institute designs prototypes and manufactures the finished articles for distribution. The items, produced individually, are related to science and mathematics. They are ordered by the Ministry of Education and distributed to all relevant institutions.

Training — The Institute participates in in-service teacher training courses.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — Educational Reform commenced in 1972 and plans were laid to revise the curriculum and rationalise the equipment. The Institute works in close co-operation with the National Audio-Visual Centre.

Comments — Further details of educational equipment in Hungary are given in the UNESCO publication New Trends in School Science Equipment.

Address	Carpentry Socio-Economic Unit, 126 G N Chetty Road, T Nagar, Madras 600017.
Level	Pre-primary education.
Production	The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines and are in the form of kits and individual items. Produced items are ordered by the Government of Tamil Nadu and distributed to all relevant institutions.
Training	The Unit participates in development and manufacture only
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The Unit started as a hobby centre in 1956 with some machinery donated by CARE. It is a Voluntary Social Service Institution giving care and protection to destitute, deserted and unwanted children. In 1961 the Central Social Welfare Board provided assistance to convert the unit into a Socio-Economic Unit.

Address	In-Service Training Centre, Education Department, Ahmedabad Municipal Corporation, Corporation Building, Ahmedabad 380001, Gujarat.
Level	Pre-primary and primary education.
Production	The Centre produces prototypes and manufactures the finished articles for distribution. The items, produced individually, are general educational equipment for various disciplines and are ordered by the Municipal Department of Education and distributed to all relevant Municipal schools.
Training	The Centre participates in in-service teacher training courses.
Maintenance	Courses for equipment, repair and maintenance are operated by the Centre.
Brief History	The Centre is part of the Municipal Department of Education and has been in existence for some six years.

Address	National Council of Educational Research and Training (NCERT), Sri Aurobindo Marg, New Delhi 11016.
Level	Primary and secondary education.

Production — The Council produces prototypes and manufactures the finished articles for distribution. Items produced are related to science and mathematics and are in the form of kits. They are ordered by the State Ministries of Education and distributed to all relevant institutions.

Training — The Council participates in in-service teacher training courses.

Maintenance — Facilities and courses for equipment, repair and maintenance are not provided.

Brief History — The NCERT was established in 1961 as an autonomous organisation financed by the Government of India. The Council is a multi-functional organisation concerned with all problems of school education in India. NCERT has six constituent units, of which the equipment activities are under the National Institute of Education through its Department of Science and Mathematics and the Workshop Department.

Comments — NCERT is an active unit of an all-embracing nature for education. The Department of Education in Science and Mathematics and the Workshop Department have, in conjunction with UNICEF/UNESCO, developed kits of apparatus for primary and secondary education. The workshops have capacity to produce some 8,000 kits or more per year. The main involvement has been in primary kits related to the UNICEF/NCERT primary science improvement project. Individuals have been accommodated for training programmes.

Address — Nehru Science Centre, Dr E Moses Road, Worli, Bombay 400018.

Level — Primary and secondary education.

Production — The Centre produces prototypes only, the individual items produced are related to science and mathematics and are developed during in-service teacher training courses and laboratory assistant training courses.

Training — The Centre participates in the above mentioned courses.

Maintenance — Facilities and services for equipment, repair and maintenance are not at present available.

Address — State Institute of Education (Science Unit), Polytechnic Hostel Building, Ahmedabad 380015, Gujarat.

Level — Primary and secondary education.

Production — The Unit produces prototypes only related to science and mathematics. The items produced are in the form of kits and individual items and are ordered by the Government Department of Education and distributed to all relevant institutions.

Training — The Unit participates in in-service teacher training courses and courses of training for laboratory assistants.

Maintenance — Courses for equipment, repair and maintenance are operated by the Unit.

Brief History — The Institute has been responsible for the implementation of the UNICEF/NCERT primary science improvement project since its start in 1971. UNICEF assistance has now been phased out.

Address — State Institute of Science Education, Jabalpur, Madhya Pradesh.

Level — Primary and secondary education.

Production — The Institute produces prototypes only related to science and mathematics education. The items produced are in the form of kits and individual items and are ordered by the Government Department of Education and distributed to all relevant institutions.

Training — The Institute participates in in-service teacher training courses and courses of training for laboratory assistants.

Maintenance — Courses for equipment, repair and maintenance are operated by the Institute.

Brief History — The Institute has been responsible for the implementation of the UNICEF/NCERT primary science improvement project since its start in 1971. UNICEF assistance has now been phased out.

Address — State Institute of Science Education, 17 Dr Ambedkar Marg, Pune 411001, Maharashtra.

Level — Primary and secondary education.

Production — The Institute produces mainly improvised items related to science and mathematics. The individually produced items are developed during the activities of the Institute in in-service teacher training courses and laboratory assistant training courses.

Training — The Institute participates in the above mentioned courses.

Maintenance — Courses for equipment, repair and maintenance are also operated by the Institute.

Brief History — The Institute has been responsible for the implementation of the UNICEF/NCERT primary science improvement project since 1971. UNICEF assistance has now been phased out.

Address	Stree Seva Mandir Unit at 'Sabarmathi', Saligramam, Madras 600093.
Level	Pre-primary and primary education.
Production	The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines and are in the form of kits and individual items. They are ordered by the Ministry of Education and distributed to all relevant institutions. The Department of Social Welfare in Tamil Nadu also orders for all pre-schools in the blocks and city.
Training	The Unit participates in development and manufacture only.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The Unit was started in 1962 and is a Socio-Economic Production cum Training Unit established by a Women's Voluntary Social Service Organisation - the Stree Seva Mandir - registered under the Society's Registration Act.
Comments	The Unit would like to expand its activities but would need external finance and expertise to do so. It is particularly interested in manufacturing Braille kits and indicates that workshop facilities are available to do so.

Address	Vikrum A Sarabhai Community Science Centre, Navrangpura, Ahmedabad 380009, Gujarat.
Level	Pre-primary, primary and secondary education.
Production	The Centre produces prototypes and manufactures the finished articles for distribution. The items produced are related to science and mathematics and are in the form of kits and individual items. They are purchased directly by individual institutions.
Training	The Centre participates in in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are not available.
Brief History	The Unit started as a voluntary organisation with support from the Nehru Foundation for Development. The Centre also receives grants from the State and Central Governments. Teaching aids and playthings are also manufactured by Pneumatic Controls, 35-B/11 Najafgarh Road, New Delhi 110015.

Other Organisations

a) The Educator-Manufacturer Association of India (EDMA)

This is a non-profit making welfare organisation which brings together educators and manufacturers in order to devise and produce at low-cost the best teaching materials and aids for the Indian learner from childhood to adolescence.

The Association holds seminars and exhibitions and awards a Trophy at Science Fairs.

Working groups devise apparatus and materials which are then marketed by member manufacturers.

b) International Council of Scientific Unions, Committee on Science and Technology in Developing Countries (COSTED), Indian Institute of Science, Bangalore 560012.

Brief History — This committee is an international committee concerned with science and technology at the secondary and tertiary levels of education. The unit is funded by UNESCO and COSTED and has been active since 1975. It has a professional staff as well as advisers from the Indian Institute of Science and the Indian Institute of Technology, Madras.

Full details are not available as to the exact involvement in equipment development and production activities.

INDONESIA

Address — Educational Facilities Development Unit, Curriculum Development Centre, Office of Educational Research and Development, Ministry of Education, Jakarta.

Level — Primary and secondary education.

Production — The Unit designs prototypes only. The items are general educational equipment for various disciplines and are produced in the form of kits.

Training — The Unit operates and participates in in-service training courses for teachers and laboratory assistants.

Maintenance — Facilities, services and courses for equipment, repair and maintenance are available.

Brief History — The Unit was established in 1974 by the Government of Indonesia with assistance from the Federal Republic of Germany.

Comments

In recent years the Ministry of Education have undertaken a massive programme to re-equip all of its schools with science teaching equipment, mainly obtained internationally from commercial suppliers.

Some low-cost production has taken place and the unit concerned with this activity is the Science Teaching Centre, Jalan Dipanegoro 12, Bandung.

The Indonesian Institute of Science (LIP) has established the Lembaga Instrumentasi Nasional (LIN). This national instrumentation unit is concerned with the repair, maintenance and calibration of scientific instruments for research purposes as well as attempting to stimulate the local manufacture of scientific equipment.

IRAQ

At present there is no 'production unit' as such. School materials are produced by a number of state organisations. Such items as chalk, wooden rulers, T-squares, copy books (notebooks) etc, are produced. Most of the scientific equipment is imported from Eastern European countries.

Educational materials for pre-primary, primary and secondary education are all developed and printed locally. Material for the tertiary level is increasingly being produced locally by the Ministry of Higher Education and Scientific Research.

A newly formed In-Service Teachers Centre is starting to produce audio-visual materials for 19 sub-centres in the provinces. The video cassettes produced are for teacher training courses.

ISRAEL

Address

Banativ Science Education Aids, Banativ Kibbutz Industry, Kfar Ruppin, Beit Shean.

Level

Mainly secondary education.

Production

The Unit produces prototypes and manufactures the finished article for distribution. The items produced are related to science (mainly physics) and mathematics education and are in the form of kits and individual items. They are purchased directly by individual institutions.

Training — The Unit participates in pre-and in-service teacher training courses and courses for laboratory assistants in conjunction with the Science Teaching Centre.

Maintenance — Facilities and services for equipment, repair and maintenance are available and courses are held in conjunction with the Science Teaching Centre.

Brief History — Banativ was set up at Kibbutz Kfar Ruppin primarily as a private kibbutz industry using ideas developed at the Weizmann Institute. Production commenced in 1973 and since that time they have gone on to develop their own designs. The Unit has been taken over by another organisation but full details are not available.

Address — Ministry of Education Pedagogic Centre, 8 King David Street, Jerusalem 94141.

Comments — The first centre was established in Jerusalem in 1955 and there are now some 38 regional centres. Some regional centres engage in the production of local material and teaching games as products of teachers' workshops. These centres are basically Educational Technology Resources Centres. The National Centre in Jerusalem produces filmstrips, slides, overhead transparencies, audio-tapes and games mainly related to Jewish subjects, local community study, Oriental, Arab and Druze folklore, cultural heritage, and bible studies.

The Curriculum Centre of the Ministry of Education and Culture indicate that the following centres are also active in the equipment field: Institute for Teaching Aids, Mohliver 26, Tel Aviv; Centre for Educational Technology, Kalusner Street, Ramat Aviv, Tel Aviv; Curriculum Centre, Ministry of Education, 7 Puram Street, Jerusalem. This latter one produces prototypes of equipment for science, agriculture, social science, language, arts and educational games.

Address — Science Teaching Department, Weizmann Institute, Rehovat.

Level — Secondary education.

Production — The Department produces prototypes only of items related to science and mathematics, produced in the form of kits and individual items. They are purchased directly by individual institutions from manufacturers.

Training — The Department participates in pre- and in-service teacher training courses and training courses for laboratory assistants.

Maintenance — Facilities and services for equipment, repair and maintenance are not available. Courses for laboratory technicians are held occasionally.

Brief History — The Science Teaching Department is one of the leading constituent departments of the Amosole Sharif Science Teaching Centre.

Comments — The STD is the only department active in the design and development of apparatus. Many of the ideas have been taken up by Banativ Kibbutz Industry (see above), and other commercial manufacturers. Much of the stimulus for the work of the Institute came originally from contact with Nuffield Science Projects and the PSSC.

JAMAICA

Information on activities is not currently available, although contact could be made with: The Science Education Centre, c/o Department of Physics, University of the West Indies, Mona, Kingston 7.

JAPAN

Equipment for educational purposes is mainly a commercial undertaking whereby equipment is purchased from manufacturers, suppliers or agents.

The National Institute for Educational Research, Tokyo, has concerned itself with a seminar on low-cost teaching aids for science. Contact could be made with the Institute.

JORDAN

Address — Teaching Resources Unit, Ministry of Education, Amman.

Brief History — This unit is mainly for visual aids of a film or printed nature, although some biological models have been made. Further information on the present position of this unit is not currently available.

Consideration had been given to establishing an equipment unit.

KENYA

Address	School Equipment Production Unit, PO Box 30596, Nairobi.
Level	Secondary education.
Production	The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are related to science and mathematics and are in the form of kits and individual items. They are purchased directly by individual institutions.
Training	The Unit participates in design and manufacture only.
Maintenance	Facilities and services for equipment, repair and maintenance may be available in the near future.
Brief History	The Unit was established as part of the Kenya Science Teachers College in 1967 with assistance from the Swedish International Development Agency (SIDA). SEPU was established as a self-financing operation and after some pitfalls was reorganised into a company with representation on the board of directors, of the Ministries of Education and Finance.
Comments	Whilst Swedish assistance was underwriting SEPU it flourished, particularly after becoming independent of the Science Teachers College. Now that Swedish assistance has come to an end some difficulties are being experienced in the self-financing area due to the need for a dynamic sales force.

Address	Teaching Aids Section, Kenya Institute of Education, PO Box 30231, Nairobi.
Level	Primary and secondary education.
Production	The Institute produces prototypes only of items related to science and mathematics, and general educational equipment for various disciplines. The individually produced items are ordered by the Ministry of Education and distributed to all relevant institutions for trial testing.
Training	The Institute participates in prototype development only which is coupled to its curriculum development activities.
Maintenance	Courses are held for equipment, repair and maintenance on an occasional basis.
Brief History	The KIE is a long established institute concerned with curriculum development. Assistance under a World Bank Loan brought about the expansion of the prototype production activity. It is envisaged that SEPU may manufacture the finished product.

Comments

KIE has had foreign assistance for a number of years. It is hoped that closer co-operation with SEPU will occur for a co-ordinated effort related to equipment for the curriculum developed by KIE.

The Ministry of Education also has a School Equipment Procurement Section concerned with purchasing items for primary schools.

KOREA

Address

Korean Teachers Mutual Fund, Science Education Corporation, 63 Suha-Dong, Jung-Ku, Seoul.

Level

Primary and secondary education.

Production

The Corporation designs prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines and are in the form of kits and individual items. They are purchased directly by individual institutions.

Training

The Corporation does not at present participate in teacher and technician courses.

Maintenance

Facilities and services for equipment, repair and maintenance are not yet available.

Brief History

The Corporation was originally established in 1973 as the Science Equipment Development Centre. In 1975 the Corporation was formed to operate the factory, which had been built in 1974. Assistance to establish the factory and develop equipment was provided by UNICEF and UNESCO respectively.

LEBANON

No known activity, although the Centre for Educational Research, Dekwaneh, Beirut, has laid plans for the development of equipment.

LESOTHO

Address — Math/Science Production Unit, Ministry of Education, PO Box 1126, Maseru.

Comments — The Math/Science Centre has been in existence for a number of years. The Production Unit building was constructed in 1976/1977, and a technician was appointed after receiving some training at the Kenya School Equipment Production Unit. The current position of the Unit is not known since a re-organisation of the Curriculum Development Activities has taken place.

In addition to the Math/Science production unit there is a furniture production unit based on the Lerotholi Technical Institute. This unit constructs benches and seats for schools.

A further activity is offered by a private mission school which has a small workshop and manufactures and repairs school furniture and also produces a primary mathematics kit for the teacher training college.

MADAGASCAR

Address — Ministere de l'Education Nationale et des Affaires Culturelles, Direction de la Planification et de Orientation de l'Enseignment, Service de la Production de Material Pedagogique (SPMP), BP 46, Tanarive.

Comments — Full details of this unit are not currently available.

MALAWI

Address — Institute of Education, Domasi.

Level — Primary and secondary education.

Production — The Institute produces prototypes only, related to science and mathematics education, as well as general education equipment for various disciplines. The items produced are in the form of kits and individual items and are ordered by the Ministry of Education and distributed to all relevant institutions.

Training	The Institute participates in in-service training courses and in the future anticipates becoming involved in laboratory assistant training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are planned for.
Brief History	The Institute of Education is expected to receive financial assistance with a World Bank loan commencing in 1981. Under this assistance the construction, furnishing and equipping of an educational materials design and resource centre, intended to produce prototypes for private manufacture, is envisaged.
Comments	The Domasi Centre was set up in 1960 to develop primary school materials (books and apparatus). The Ministry of Education provided the services of a carpenter and UNICEF provided tools. The Centre was mainly concerned with teacher training, particularly with orientating teachers towards using local materials in their teaching.

MALAYSIA

Address	Curriculum Development Centre, Ministry of Education, Pesiaran Duta, Kuala Lumpur.
Level	Pre-primary, primary and secondary education.
Production	The Centre produces prototypes only for science and mathematics, and general education for various disciplines. The prototypes are produced individually and commercial manufacturers produce the finished articles.
Training	The Centre participates in in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The CDC was established in 1973, with assistance from UNDP/ UNESCO and a World Bank loan.
Comments	The CDC is housed in purpose-built premises with hostel accommodation. The workshops produce prototypes related to the curriculum being developed. Once the prototypes are accepted the designs are available for commercial manufacture by private companies. Quality control is exercised by the CDC.

Address	Regional Education Centre for Science and Mathematics (RECSAM), Penang.

Level	Primary, secondary and tertiary education.
Production	The Centre produces prototypes as part of course-work activities. The items produced are related to science and mathematics education.
Training	The Centre operates in-service courses for teachers and teacher-educators for curriculum and equipment development activities.
Maintenance	Courses for equipment, repair and maintenance have also been held.
Comments	For fuller details regarding this Centre, see: Low-Cost Equipment Production. Some Alternative Approaches; also, New Trends in School Science Equipment.

MAURITIUS

Address	Mauritius Institute of Education.
Level	Secondary education.
Production	The Institute produces prototypes only related to science and mathematics. Produced individually, the items are developed during teacher training courses.
Training	The Institute operates pre- and in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are not yet available.
Brief History	The unit, established in 1980 with assistance from the British Council, developed out of the Science Department which had established a small workshop facility for producing equipment related to the Mauritius Integrated Science Project.

MEXICO

Address	Direccion General de Materiales Didactos y Culturales, Av Circunvalacion y Tabiqueros, Mexico 2DF.
Level	Pre-primary, primary and secondary education.

Production	The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are general education equipment for various disciplines, in the form of kits of apparatus. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit participates in pre- and in-service teacher training courses and courses of training for laboratory assistants.
Maintenance	Facilities, services and training courses for equipment, repair and maintenance are available.
Brief History	The unit is a division of the Ministry that has responsibility for the production of official educational equipment for the schools at primary and secondary level. It also operates with educational television schemes.

Address	MADIC Av Circunvacion y Tabiqueros, Mexico 2DF.
Level	Tertiary education.
Production	The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines; in the form of kits of apparatus. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit participates in pre- and in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The unit was established in 1968 in conjunction with the Organisation of American States.
Comments	There are also a large number of private commercial organisations producing all but the most sophisticated types of scientific equipment.

MOROCCO

Address	Centre de Material et de Documentation. (a) College Tadili, Rue Jazinat, Al Arab, Rabat. (b) Lycee Moulay Abdallah, Avenue Modibo Keita, Casablanca. (c) Lycee El Ouafa, Rue de Indochine, Ain Diab, Casablanca. (a) and (b) for chemistry and biology, (c) for physics.

Level	Secondary education.
Production	The Centre designs prototypes and manufactures the finished articles for distribution. The items, produced individually, are for science and mathematics. They are purchased directly by individual institutions.
Training	The Centre operates pre-service teacher training courses.
Maintenance	Facilities for equipment, repair and maintenance are available.
Brief History	The Centre was established in 1972.
Comments	A plan is in preparation to establish a production unit with assistance from Kuwait.

NEPAL

Address	Janak Educational Materials Corporation (JEMC), Sano Thimi, Kathmandu.
Level	Primary and secondary education.
Production	The Corporation produces prototypes and manufactures the finished articles for distribution. The items produced are textbooks in all subjects as well as some science apparatus. Produced items are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Corporation participates in development and production only and is not involved in course work.
Maintenance	Facilities and services for equipment, repair and maintenance are not available at present.
Brief History	The JEMC was established in 1961 with assistance from USAID and in later years it received assistance from UNESCO and UNICEF. The Corporation took responsibility for producing textbooks in 1971-72. A small science equipment prototype and production unit was set up at the Science Education Centre, Harihar Bhawan in 1971, and this activity came under the control of the JEMC in 1974.
Comments	The production of textbooks is much the major activity of the unit and it has recently taken delivery of two more presses, making a total of ten, to expand its production capacity. Approximately 200 titles are in production from manuscripts prepared by the Curriculum Development Centre of the Ministry of Education. The science equipment catalogue lists 57 items of low-cost secondary school science apparatus but it appears that not many schools have the financial resources or interest to buy them.

NEW ZEALAND

Address	Resources Development Division, Department of Education, Wellington.
Brief History	This Division includes the Visual Production Unit, the National Film Library, the School Publications Branch, and the Audio Production Unit. An officer responsible for the development of school libraries and information systems is attached to the Division. The Division produces materials for pre-primary, primary and secondary education for general educational purposes. The materials are produced in the form of kits and individual items and are available by direct purchase as well as being supplied by the Department of Education for free distribution to schools. In-service and pre-service courses are operated for teachers and advice on repair and maintenance facilities and services is available.
Comments	The material produced is in the form of printed matter, film, and other audio-visual aids. The major emphasis of the Division is to produce, in a co-ordinated programme, resources for learning in relation to priorities of curriculum development as they currently exist. The management and effective use of these resources is another major concern of the Division.

NIGERIA

Address	Federal Science Equipment Centre, IA Birrel Avenue, Yaba, Lagos.
Level	Primary and secondary education.
Production	The Centre produces prototypes only related to science and mathematics. They are produced in the form of kits and individual items and are distributed to institutions for trial testing.
Training	The Centre participates in in-service teacher training courses and laboratory assistant training courses.
Maintenance	Facilities, services and courses for equipment, repair and maintenance are available.
Brief History	The Centre was established in 1971 with assistance from UNDP/ UNESCO. Items produced were mainly related to specific projects and teacher education courses. Repair and maintenance facilities and services were a considerable part of the work of the Centre.

Comments	The Centre is a Federal Ministry of Education Unit which also provides assistance to state centres. The unit has reduced its activity in equipment development in favour of training programmes and repair of equipment. Some activities on development and production of equipment are taking place in Enugu at the Project Development Agency (PRODA).

Address	Science Education Unit, PMB 1109, 94 Nwaniba Road, OYO, Cross River State.
Level	Secondary education.
Production	The Unit produces prototypes only related to science and mathematics. Produced individually, they are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit participates in laboratory assistant training courses
Maintenance	Facilities and services for equipment, repair and maintenance are available on a limited scale.
Brief History	The Unit was set up as part of the Education Development Centre of the Ministry of Education in 1975-76, with assistance from a British Government VSO. The unit constructs apparatus and furniture for school laboratories and prepares designs which can be made locally by schools themselves.
Comments	The unit was established by the Cross River State to meet its own educational needs.

Address	Science Equipment Workshop, Advanced Teachers College, Abraka, Bendel State.
Level	Primary and secondary education.
Production	The Workshop produces prototypes and manufactures the finished articles for distribution. The items produced are related to science and mathematics and are in the form of kits of apparatus. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Workshop participates in in-service teacher training courses and courses of training for laboratory assistants.
Maintenance	Facilities and services for equipment, repair and maintenance are not yet available.
Brief History	In 1971 the Science Curriculum Centre was established at Abraka and was concerned with developing a Primary Science Project for the then Mid-West State (now Bendel State).

A purpose-built workshop facility was built in 1974. The project was assisted by UNESCO/UNICEF in terms of manpower and equipment.

Comments — This State Centre was established with assistance from the Federal Centre in Lagos. From the start the Centre was operating three-month in-service training courses for primary teachers with a considerable workshop component in the programme, the intention being to encourage the teachers to be more innovative in their teaching.

OMAN

Address — The Science Laboratories and Audio-Visual Aids Section, Ministry of Education, PO Box 3, Muscat.

Level — Primary and secondary education.

Production — The Unit produces prototypes and manufactures the finished articles for distribution. The items produced are general educational equipment for various disciplines in the form of kits and individual items. They are ordered by the Ministry of Education and distributed to all relevant institutions.

Training — The unit participates in development and production only, but provides some courses when requested.

Maintenance — Courses for equipment, repair and maintenance are operated by the unit.

Brief History — The unit commenced operation in 1974 with the assistance of an expert seconded from Jordan but financed by the Oman Government. Currently there are some twelve persons working at the unit.

PAKISTAN

Address — National Educational Equipment Centre (NEEC), Wahdat Colony, Lahore.

Level — Primary and secondary education.

Production — The Centre produces prototypes and manufactures some of the finished articles in conjunction with local industry. The items produced are related to science and mathematics and are in the form of kits for primary education and individual items for secondary and higher-secondary education. They are ordered

by the Ministry of Education and distributed to all relevant institutions.

Training — The Centre participates in in-service teacher training courses and in-service laboratory assistant training courses.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — NEEC was established in 1964 with assistance from the Ford Foundation. Recently UNDP/UNESCO have provided some workshop equipment and UNICEF are providing funds for the supply of primary teaching kits for all schools in the country.

Comments — For a long time the Centre was concerned with the development of prototypes, with local industry providing the manufacturing of the articles developed. Expansion plans envisage the Centre as providing production capacity also.

For a more detailed explanation of this Centre, see New Trends in School Science Equipment.

PANAMA

Information on activities is not currently available. Contact could be made with: Escuela de Fisica, Facultad de Ciencias Naturales y Farmicia, Universidad de Panama, Apartado 10761, Panama City.

PAPUA NEW GUINEA

Address — Materials Development and Evaluation Unit, Ministry of Education, Science and Culture, PO Box 2051, Konedobu, National Capital District.

Comments — The main activities of the Unit have been related to the printing of textbooks, worksheets etc, with assistance from UNESCO. This activity has now been expanded to include the development of prototypes of equipment, mainly for primary and secondary education. Full details are not currently available.

Some equipment activity is also taking place at the: Goroka Teachers College, PO Box 178, Goroka.

Address	Mathematics Education Centre, UNITECH, PO Box 793, Lae.
Level	Primary, secondary and tertiary education.
Production	The Centre produces prototypes and intends to manufacture the finished articles for distribution in the near future. The items, produced individually, are related to mathematics curricula and are purchased directly by individual institutions.
Training	The Centre participates in in-service teacher-training courses and laboratory assistant training courses (basic maths for university laboratory technicians).
Maintenance	Facilities and services for equipment, repair and maintenance are not available.
Brief History	The Maths Learning Project started in the Mathematics Department of the University of Technology in 1973. In 1977 the Mathematics Education Centre was established out of the Resource Centre. In 1978 the Centre ventured into buying and selling mathematics teaching aids whereas previously items had been available on a loan basis. Development of teaching aids takes place and this activity is likely to increase.

PERU

Information on activities is not currently available. Contact could be made with: Programa Nacional para el Majoramiento de la Ensenanza de las Ciencias (PRONAMEC), Coraceros 158, Lima 21.

PHILIPPINES

Address	Instrumentation Division, National Institute of Science & Technology, National Science Development Board, Dicutiun, Metro Manila.
Level	Primary and secondary education.
Production	The Unit produces prototypes and manufactures finished articles. The items produced are related to science and mathematics and are in the form of kits. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Unit is only concerned with the development and production of equipment in conjunction with the Science and Education Centre.

Maintenance — Facilities for equipment, repair and maintenance are not yet available.

Brief History — The development and production workshop commenced activities in 1976 and has recently moved to the address above. Previously the workshop was part of the Engineering Department of the University of the Philippines.

Address — Science Education Centre, Vidal Tan Hall, University of the Philippines, UP PO Box 18, Diliman, Quezon City.

Level — Primary and secondary education.

Production — The Centre produces some prototypes related to science and mathematics education in the form of kits. Produced items are manufactured by a separate production unit.

Training — The Centre participates in in-service teacher training courses operated by the Science Education Centre, and laboratory assistant training courses operated by the College of Engineering, University of the Philippines.

Maintenance — Facilities and services for equipment, repair and maintenance are not available at present but planned for within the next five years.

Brief History — The Centre was established some three years ago with assistance from UNESCO/UNDP. It is a joint under-taking between the University and the Government.

The Centre works in close conjunction with the production unit outlined above.

QATAR

The Ministry of Education have an equipment centre operated by the Inspectorate. It is housed in a secondary school and is concerned with the procurement and distribution of equipment obtained from commercial suppliers. An Audio-Visual Aids Centre is also in existence. Full details are not currently available.

SIERRA LEONE

Address	Science Curriculum Development Centre, Njala University College, PMB Freetown.
Level	Primary education.
Production	The Centre produces prototypes only related to basic science teaching. Produced individually, items are directly purchased by individual institutions.
Training	The Centre participates in pre-service and in-service teacher training courses.
Maintenance	Facilities and services for equipment, repair and maintenance are not available.
Brief History	The Centre was established with multi-lateral aid in the late 1960s in conjunction with the Science Education Programme for Africa (SEPA).
Comments	After its initial inception the Centre suffered a number of setbacks, mainly in the form of a lack of positive direction and financial support. Currently it is working well below capacity and in isolation from the mainstream of science impetus, namely integrated science at the first three years of secondary education. A re-appraisal of the unit is needed.

SINGAPORE

Equipment for educational purposes is mainly a commercial undertaking whereby equipment is purchased from manufacturers, suppliers or agents.

SRI LANKA

Address	Science Equipment Production Unit, Pattalegedera.
Level	Primary and secondary education.
Production	The Unit produces prototypes and manufactures finished articles for distribution. The items produced are related to science and mathematics in the form of kits and individual items.

They are ordered by the Ministry of Education and distributed to all relevant institutions.

Training — The Unit participates in development and production activities only.

Maintenance — Facilities and services for equipment, repair and maintenance are available.

Brief History — The Unit was established in 1965 and came into production in 1967. It is under the control of the Ministry of Education and received assistance from UNDP/UNESCO and UNICEF.

Comments — The fortunes of this Production Unit have been variable and of late quite poor. Efforts are now being made to re-activate the Unit, possibly with further external assistance.

SUDAN

Equipment for educational purposes is apparently produced by various Government departments or externally aided projects. Due to limited resources and expertise the items produced by Government departments are fairly basic in quantity and quality. Items for specific projects are orientated specifically to them with little outside relevance.

SWAZILAND

Address — Science Education Centre, William Pitcher College, PO Box 87, Manzini.

Level — Primary and secondary education.

Production — The Centre produces prototypes and manufactures finished articles for distribution. The items, produced individually, are related to science and mathematics curricula and are purchased directly from the unit by individual institutions.

Training — The Centre participates in pre-service and in-service teacher training courses.

Maintenance — Facilities for equipment, repair and maintenance are available on a limited scale.

Brief History — The Centre commenced operation in 1972 with manpower assistance from the British Council. Machinery and handtools were provided by UNDP and the World Bank.

Comments — A small range of apparatus has been produced, but after the departure of the foreign expertise the Centre has had limited effectiveness mainly due to a lack of positive direction.

SYRIA

The Ministry of Education have an equipment store in Damascus from which small amounts of equipment and other materials have been distributed. The store contains samples of imported equipment. It also has a two-room workshop and an offset litho room with plate making equipment.

There is provision in the Second World Bank Education Project for Syria for an Educational Materials Production Centre to be built. Work is planned to start during 198?.

TANZANIA

Address — School Equipment Development Unit, Institute of Education, PO Box 35094, Dar es Salaam.

Level — Primary and secondary education.

Production — The Unit produces prototypes only. The items, produced individually, are related to science and mathematics as well as general educational equipment for various disciplines. They are expected to be purchased by individual institutions.

Training — The Unit participates in training courses for teachers.

Maintenance — Services and facilities for equipment, repair and maintenance are planned to be provided in the near future.

Brief History — The Unit was planned to commence operation in 1981 with assistance from the Swedish International Development Agency (SIDA). Specific areas of attention will be the mapping out of the needs of schools regarding equipment, ascertaining the resources for local production, developing prototypes of materials needed, and initiating and co-ordinating the production of those items most urgently needed.

Comments	There is also a para-state organisation known as Tanzanian Elimu (Education) Supplies which is the official Government supplier of equipment and materials. Some attempts were made by them to manufacture items locally but without success. The Small Industries Development Organisation (SIDO) has plans to produce a number of basic educational materials in the future.

THAILAND

Address	Institute for the Promotion of Teaching Science and Technology (IPST), Behind Planetarium Compound, Sukhumvit Road, Bangkok II.
Level	Primary and secondary education.
Production	The Institute produces prototypes only related to science and mathematics. The items are produced individually and are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Institute participates in in-service teacher training courses.
Maintenance	Courses for equipment, repair and maintenance are operated by the Institute.
Brief History	IPST was established with assistance from UNDP/UNESCO and granted a semi-autonomous status within the Ministry of Education in 1972.
Comments	IPST is mainly concerned with innovation in education. It produces equipment for its own centres, 36 of which are established in Teacher Training Colleges, and for selected schools.

Address	National Curriculum Development Centre, Department of Educational Techniques, Ministry of Education, Bangkok.
Level	Pre-primary, primary and secondary education.
Production	The Centre produces prototypes and manufactures finished articles in conjunction with Suksaphan Panich (see below). The items, produced individually, are related to general educational equipment for various disciplines. They are purchased directly by individual institutions.
Training	The Centre participates in prototype development only.

Maintenance	Facilities and services for equipment, repair and maintenance are not available.
Brief History	The NCDC was established in 1974 with assistance from a World Bank loan.

Address	Suksaphan Panich, Rajdamneru Avenue, Bangkok.
Level	Pre-primary, primary and secondary education.
Production	The Unit produces prototypes and manufactures finished articles for distribution. The items, produced individually, are general educational equipment for various disciplines, and are purchased directly by individual institutions.
Training	The Unit participates in development and production activities only.
Maintenance	Facilities and services for equipment, repair and maintenance are available.
Brief History	The unit was established as an equipment manufacturing unit in 1975, with assistance from UNDP.
Comments	IPST and the NCDC (see above) work within the framework of the Department of Educational Techniques. They are both concerned with the design and specification of equipment with IPST being responsible for mathematics and science and NCDC for all other subjects. Suksaphan Panich produces articles of equipment in bulk which are purchased by the individual institutions.

TURKEY

Address	Ders Aletleri Yapim Merkezi, Gazimahallesi, Ankara.
Level	Pre-primary, primary and secondary education.
Production	The Centre designs prototypes and manufactures finished articles. The items produced are for general educational equipment for various disciplines and are in the form of kits. They are ordered by the Ministry of Education and distributed to all relevant institutions.
Training	The Centre participates in in-service teacher education courses.
Maintenance	Facilities and services for equipment, repair and maintenance are available.

Brief History — DAYM was established in 1961 by the Turkish Government with assistance from the OECD and the Ford Foundation.

Comments — An Audio-Visual Centre also exists, which was established in 1961 as the Film and Graphic Centre. This centre is concerned with film, radio and television.

UNITED ARAB EMIRATES

Information on activities is not currently available. Contact could be made with: The Director, Audio-Visual Aids Department, Ministry of Education, Abu Dhabi.

VENEZUELA

Information on activities is not currently available. Contact could be made with: Centro Nacional para el Majoramiento de la Ensenanza de las Ciencias (CENAMEC), Apartado 75055, Caracas 107.

VIETNAM

The Government of Vietnam in conjunction with UNICEF are constructing two factories, both of which are designed to produce school equipment from the pre-primary level through to the secondary level of education. Full details are not currently available.

ZAMBIA

Address — The Audio-Visual Aids Library, Education Services Department, PO Box 50295, Lusaka.

Level — Primary and secondary education, teacher training and adult education.

Production — The Library produces 16mm films and slides predominantly in the area of social studies, and is planning an extension into transparencies for overhead projectors, as well as wall charts. The individually produced items are loaned to schools and colleges.

Training — The Library is primarily a lending library for audio visual material.

Maintenance — Facilities and services are available for the repair of television sets, radios, and 16mm projectors. There is also a branch workshop on the premises of Zambia Broadcasting Services in Kitwe.

Brief History — The Library was founded during Federation and its operational centre was then in Salisbury. With the break-up of the Federation, Zambia obtained its share of the collection and expanded its services to all schools in the country. With this expansion the unit set up a maintenance section to service equipment. Although the unit does produce films and slides it is nevertheless still primarily an Aids Library.

Address — David Livingstone Teacher Training College, Private Bag I, Livingstone.

Level — Pre-primary and primary education.

Production — The College produces prototypes and manufactures finished articles for distribution. The items, related to Social Studies, Science, Mathematics and English, are produced individually, with kit production forseen for the future. They are purchased directly by individual institutions of teachers.

Training — The College participates in pre- and in-service teacher training courses.

Maintenance — Facilities and services for equipment, repair and maintenance are not available.

Brief History — The training college is a grant-aided college principally run by the Christian Council of Zambia. The unit was started in late 1975 with some international finance from Finland and Church organisations. The British Council have provided some software. The equipment produced are general learning aids for specific skills.

Comments — Under Zambia's Educational Reform, plans exist to set up Resource Centres in a number of Teacher Training Colleges and at the Curriculum Development Centre, which will include production of materials and also the local production of equipment.

Address — Junior Engineers, Technicians and Scientists (JETS), University of Zambia, School of Engineering, Box 32379, Lusaka.

Brief History — This is a national educational organisation which co-ordinates the out-of-school and extra-curricula science activities of the youth of Zambia. It has a full-time secretary assigned from the Ministry of Education Inspectorate. The University of Zambia have a Technology Development and Advisory Unit, and this unit through the JETS network of clubs etc, provide some low-cost science teaching equipment, under a production technology project.

JETS operates mainly at the secondary school level. It organises science fairs, science quizzes, workshop courses and disseminates science and technology information.

Comments — JETS have been in existence for some 12 years with variable degrees of activity. It is worthy of study for interested persons concerned with setting up science clubs and organising science fairs.

Address — National In-Service Training College (NISTCOL), Chalimbana, Private Bag EI, Lusaka.

Level — Primary education.

Production — The College produces prototypes and manufactures finished articles for distribution. The items, produced individually and in sets of apparatus, are related to science and mathematics education and are obtained via in-service teacher training courses.

Training — The College participates in in-service teacher training courses.

Maintenance — Facilities and services for equipment, repair and maintenance are not available.

Brief History — The equipment development and production acitivities commenced in 1975. A Danish expatriate, teaching in the Western Province, was transferred to NISTCOL to develop the activity. Assistance in the form of handtools (3,000 tool boxes) were provided by Finland. The tool kits were for primary schools and primary teacher training colleges.