EDUCATIONAL TELEVISION

Of all the media included in this study, television has aroused most expectations and hopes and has attracted most attention. This was particularly so in the late 1950s and early 1960s when there was a rapid - almost mushroom - growth of national television services around the world. At that time extravagant claims were made on its behalf. It was seen as the universal panacea for all educational ills. It appeared to offer many attractive features - the ability to synthesize all existing audio-visual aids in one medium; the ability to use the scarce resources of top quality teachers by having them appear on the screen; the ability to replace unqualified teachers by a television set; the ability to ensure uniform educational standards throughout a country; the ability to share and exchange programmes with other countries. All these aims were expressed by enthusiastic advocates of television. Unfortunately, and all too often, this enthusiasm has come from politicians or individuals on the fringes of education. That television is an effective medium of communication is not in doubt - the figure of about 350 million television sets currently in use throughout the world more than justifies this statement. What is in doubt is how this powerful medium can best be used for educational purposes.

The experiences of the past ten years have shown that to be effective for educational purposes, television must be planned, developed and used in ways specific to the needs of education. Broadcasting structures and patterns can be irrelevant and wasteful. Educational television should be seen in its own right and not as an adjunct or as so often happens, the poor relation of general television. The features which make television the vitally important communication medium which it is today - its immediacy, its wide coverage, its universality of input and output through the satellite system, its appeal to central authorities, are not necessarily those which can contribute to its educational effectiveness.

In this study, three situations were selected where television is the main element or core of an educational strategy. Reference is also made in the conclusion to the educational television activities of the joint radio and television operation of the Ministry of Education in Zambia.

It is appreciated that television is used in projects included in other studies, but there it is often only one element in a wider approach. The case studies cover the use of television at primary, secondary and tertiary levels. All are now established services and it is possible to identify various factors which have contributed to their effectiveness.

* * * * *

HONG KONG: EDUCATIONAL TELEVISION SERVICE

Introduction

Hong Kong is very small (400 sq. miles) but the most densely populated territory in the Commonwealth. For a number of years the emphasis on education, at least in the primary sector, was quantitative. Priority was given to the provision of primary school places for all children. This objective involved three main types of school: those run by the government; those operated by voluntary bodies but assisted financially by the government; and those run and financed by private bodies and individuals. There are some 750 government and government-aided schools and 504 private institutions with a total enrolment in the primary sector of just over 723,000. Free primary education was introduced to all government Chinese primary schools and the majority of aided primary schools in 1971. The aim of the six-year primary course is to provide 'a good general education appropriate to the age range and the particular environment of the children'. Most schools teach in Chinese - the Cantonese dialect - with English introduced as a second language in the second year. Almost all government and aided schools and some private schools operate in two sessions - from 8 a.m. to 1 p.m. and from 1.30 to 6.30 p.m.

The dominating factor of the entire primary school system is the final examination for entry into secondary school which is taken in the Primary VI class. Because of the prominence given to this examination, primary schools still tend to be examination-orientated. Both teachers and pupils, backed by the very strong

support of the parents, give emphasis and application to those subjects which are likely to produce the 'best' results in their secondary school entrance examination. As a result, Hong Kong is less 'developed' in terms of primary education than some other member countries, in regard to the introduction of new or more progressive methods and techniques.

Into this situation educational television was introduced in 1971. This was the result of a long and detailed planning process whose roots went far back into the history of education in Hong Kong. In the immediate post-Second World War period, the BBC was invited to send an expert to report on the possible development of radio for educational purposes, and this report was produced in 1947. In 1949, due to a tremendous influx of immigrants, the population went up from around 600,000 to over two million. This necessitated a major school building campaign and from then onwards the financial resources of the Department of Education were largely channelled into this building project.

Towards the end of the 1950s when it was felt that the teaching of social studies and civics should be developed in the schools, a working party was set up to reconsider the original report for the establishment of a schools radio service. At that time thought was given to placing this service within the government-controlled Radio Hong Kong broadcasting operation, rather than operating under the Department of Education. However, for a variety of reasons plans for this educational radio service were postponed.

Around 1964 the Government of Hong Kong was studying the implications of introducing a wireless television service in addition to the wired or cable television service which was then in operation. A senior officer of the Department of Education was granted a six-month UNESCO Fellowship to study the uses then being made of television in a variety of educational situations. (Japan, USA - California, Washington, New York, Boston and Hagerstown - Canada, the United Kingdom, France, Italy, Egypt and India were included in his study tour.) Although this study enabled plans for the introduction of an educational television service to be put forward again in 1965, official interest in the project waned.

Following the acceptance of recommendations made by a Government Working Party on broadcasting in 1967, it was agreed in principle that there would be an Educational Television Service, but not an educational radio service. It was not until 1969 that final approval was given and finances made available to begin planning and building the ETV station. A period of intensive preparation followed, which enabled the service to begin transmissions to schools less than two years later in September 1971.

Although a considerable period of time elapsed between the initial awakening of interest in the potential of television and the first transmission to schools, this time was used to refine the various plans, ideas and theories put forward. Latterly, and most importantly, it was used to create a favourable climate of opinion among those teachers who would be using the service.

Objectives

In the plans for the establishment of the Service it was agreed that its prime purpose would be to improve the quality of education at the primary level. In the initial planning stages, a number of key policy statements were laid down and have been followed. The most important of these - both from the point of view of the effectiveness of the ETV Service and of their possible information value to others are:

1. If there was to be a television project, it must be properly and professionally conducted.

2. Pilot projects using temporary accommodation in unsuitable premises were ruled out as likely to be blind alleys.

3. There was to be no compromise on the question of control or shared control. The Service was to be an educational television service controlled by the Department of Education. It would be directed and controlled by educators who were trained in television techniques.

4. All staff of the Service were to be full-time members of the Service and on a permanent basis, not on secondment or on contract.

5. Where necessary, outside professional consultants were to be used and approval for this was obtained.

6. The Director of the Service was given freedom in selecting his deputy.

The Educational Television Service drew on the experience of a large number of countries. The Service freely acknowledges that in some instances ideas were borrowed and others rejected, and in other instances

local solutions were pursued.

Since a basic premise of the Service was that, if it were to exist it should do so at the professional level, the facilities of the ETV Service match those that are available to the two commercial television services in Hong Kong.

It was recognized in Hong Kong that quality is never cheap, but nevertheless, economy, without sacrificing quality, has conditioned the planning of ETV. The ETV Production Centre is a custom-built two-studio two-storey building occupying some 12,000 sq.feet between the two commercial television stations. Together with the studios of Radio Hong Kong it forms part of a very tight and coherent broadcasting complex.

Working Method

A sine qua non of ETV planning for Hong Kong has been the close integration of ETV lessons with syllabuses and timetables actually in use in the classrooms, and this was confirmed by extensive surveys of professional opinion. Committees were set up to draft ETV syllabus outlines which were directly related to the syllabuses in use in primary schools and which would concentrate on topics specifically requested by teachers in the course of ETV surveys. At the same time seminars for teachers from the primary schools were conducted by the Service during school holidays. Before the Service began transmission, over 6,000 teachers had attended these seminars and had been brought into contact with the operation of the Service.

All ETV programmes have been locally made and have a marked local flavour. Though the fifteen-minute television programme is the focal point of the lesson, the Service has produced workbooks on all subjects for every pupil watching the programmes to be used before and after each television lesson. Together with the television lesson, they form a teaching package which contributes significantly to the quality of the overall instruction.

After the decision had been taken to produce television programmes for the primary sector, a survey showed that Primary III was the most acceptable level at which to begin. A number of sound educational and organizational reasons were put forward by the teachers for this decision. The experience of the first three years of operation of the Service has confirmed this decision. Opinion was also canvassed as to the most appropriate subjects. The response confirmed the desire of the schools to receive solid instructional material directly related to the work of the schools, rather than enrichment programmes. The subjects chosen were in the basic areas of Chinese language, English language, mathematics and social studies. With the exception of English language programmes, all are taught in Chinese. At first one programme a week in each of the four subject areas was produced and transmitted. As the service developed in the second year to take in Primary IV, a further four series of programmes were produced, and at present programmes in the same subject areas are being produced for Primary V.

Present Operations

Programmes currently go out to levels Primary 3, 4 and 5 on a total saturation basis. Transmission begins at 8.10 a.m. and continues until 11.45 a.m. Then it resumes at 1.10 p.m. and continues until 3.55 p.m. Unlike some services, programmes are put out 'end-on' with minimal breaks between and schools make the necessary adjustment to their schedules to receive these programmes. In the morning session there are thirteen transmissions, and in the afternoon, ten.

The transmission system is rather unusual. Although the production facilities are owned, operated and staffed by the Department of Education, the transmission facilities are owned by commercial services. The ETV Service is allowed free transmission as a condition of the licence by which the commercial services operate. Programmes are recorded on videotape in the ETV Services and then relayed by coaxial cable to the neighbouring commercial television services for subsequent transmission through their transmitters. Television coverage in Hong Kong is virtually complete, although there are a very few areas in the outlying islands and near the Chinese border where coverage is perhaps less than perfect. The two stations transmit the ETV television programmes during the day between 8 a.m. and 4 p.m. with a lunch-break at noon.

One of the unique features of the ETV Service is the number of television receivers made available to primary schools. The target is one television receiver for every two classrooms in government and government-aided schools. This means a provision of up to ten receivers per school. There are almost 3,000 receivers at present in use in the education system and this number will increase as the level of programming goes up through the system. Receivers are distributed to the schools by commercial organizations which have entered into a contract with the Department of Education. The receivers are essentially domestic 24" models with normal

controls modified by the provision of an extra loudspeaker, special stand and lockable case for security purposes. The firms which supply the receivers are also responsible for their maintenance on a contractual basis. The suppliers work on the assumption that each receiver will have a life span of about eight years and on this basis they charge an annual maintenance fee of HK$90. per year per set. Prior to the awarding of these contracts, technical specifications were drawn up by the Educational Television Service. The receivers cost about £100 each with up to another £50 for the additional accessories, installation costs; and the cost of installing an internal distribution system within each school.

In spite of this contractual system of maintenance, the effective working of television receivers has presented something of a problem to the ETV Service. This was felt to be due to poor standards of installation and subsequent maintenance and also to a measure of ill use and lack of confidence in use by the teachers. It was felt that the receivers could well withstand the climate, which sometimes exceeds 30°C with more than 95% humidity, as long as they were used regularly. The inefficient maintenance service initially provided highlighted the need for the ETV Service to have competent engineers able to respond immediately to complaints from the schools. The schools tend to use the ETV Service as their first point of contact in the event of breakdowns. In an attempt to improve efficiency the engineers from the television service check the installation of the receivers in the schools before their acceptance. It was felt by the ETV Service that ideally a small section of three or four people acting as 'diagnosers' or 'trouble shooters' and who would be a contact between the schools and the contractors would improve the efficiency of the operation.

The technical standards of transmission are very high and in the opinion of the station engineer are at least as high as those prevailing in Japan or in the United States. Certainly the evaluation returns show that physical conditions of reception do not present a major problem.

Programme Production

A distinctive aspect of the ETV Service is that the producers work in teams. For each subject area there is a team of three producers working with three full-time presenters - who also act as research assistants and floor managers. Each unit is responsible for the production of one programme series a year - a full series consists of thirty programmes, split into two terms of fifteen each.

The programme committees plan the programmes. The senior producer from each production team acts as the chairman of these committees and the chairman is responsible for inviting members to participate. A typical committee will consist of around twelve people, with representatives from the inspectorate, teachers, headmasters, teacher training colleges and/or the universities. The committee considers the syllabus for the appropriate level and draws up a framework of programmes to match this syllabus. Programming planning takes place about a year before transmission and the programme committee meets up to ten times during its planning activities. Once the planning committee has defined the teaching objectives and has broken those down, according to their place in the syllabus, responsibility passes back to the production team. The senior producer allocates units of work or programmes to members of his team, who go through the usual production process. In addition, the producer is responsible for producing and editing the workbooks for the pupils and the notes for teachers.

Each producer has a work load of around ten new programmes a year and associated notes. He will probably also be required to remake four to six existing programmes. Taking leave into account, each producer produces a programme every three weeks. A measure of the care and intensity of preparation and professionalism which goes into each programme is indicated by the fact that each fifteen-minute television programme is preceded by about four hours of studio rehearsal and recording, which in turn have been preceded by some eight hours of rehearsal and preparation outside the studio. Each programme is completed at least six weeks before transmission. In addition to his production duties, each producer is required to visit a school at least once a week. Producers are also required to participate in the seminars for teachers conducted during the long vacation. All the senior producers are members of the Department of Education's Curriculum Planning Committee. Indeed, within the context of curriculum innovation and development, the Educational Television Service and its production staff are major instruments for change.

Each producer is allowed a budget of up to about HK$500 for programme fees, scripting fees and acquisition of material. These programme budgets are not, however, apportioned on a strict pro rata basis, since certain subjects may require more expensive materials or a greater use of

film, for example, than others. Petty cash is readily available for production expenses and this contributes to efficiency. The financial control and method of working is more akin to that of many broadcasting services rather than to the more cumbersome channels of government service.

As regards the provision of transport, the Service has its own van which can accommodate up to 14 people. The producers have their private cars registered to make them eligible for mileage payments on official duties. Where necessary, application can be made to the Government Transport Pool for transport that cannot be provided by the Service, for example a large van or heavy lorry to transport equipment or props.

User Profile

There are some 380,000 children in all P.3, P.4 and P.5 classes in Hong Kong. The number of children viewing which is accurately calculated, based on the number of work books sold to pupils, is 330,000. This means that 87% of the total potential audience in these three classes is actively making use of the service.

Although government policy is that the schools should make use of the Educational Television Service, viewing is compulsory only in government schools. A study of the schools with classes at P.3 level showed that 100% of government schools, 99% of aided schools and some 50% of private schools used the Television Service. These private schools can be divided into two main categories:

1. The non-profit making schools - run by missions, etc. Almost 100% of these take educational television.

2. The profit-making schools:

   a) Those housed in what could be termed proper school buildings. This group makes considerable use of ETV;

   b) those that are housed in tenement flats or other small cramped one or two classroom situations. Significantly this group does not make much use of the television service.

Each child in P.3, P.4 and P.5 views four programmes a week in the main subject areas, and these programmes, together with the associated pupils' workbooks and teachers' notes make up learning packages occupying at least four periods. Since there are some thirty-seven periods in a week, the television service contributes around 10% of the total teaching time in the school system. However, there are many schools in which ETV programmes are viewed more than once, and in these schools the service contributes more than 10% of the total teaching.

Staff

The staff who were originally appointed to the ETV Service were selected from the teaching profession. At present, producers are equivalent to inspectors and the assistant producers are equivalent to assistant inspectors. New production assistant grades were created for film, graphics and technical staff. This system has led to the ETV Service being staffed by highly qualified and experienced personnel - graduates with post-graduate qualifications, with teaching experience and very often with inspectorial or lecturing experience. This situation although leading to a high quality of professional output in itself, nevertheless does create problems of internal promotion. The ETV Service, although very much part of the Department of Education, is nevertheless a highly specialized and somewhat separate unit from the rest of the Department. There is a feeling that producers working with the Department could perhaps find themselves passed over for promotion. This is a problem common to all specialist activities.

Although the Service is staffed by highly qualified and experienced production personnel, although the technical support facilities are of very high order and the general administration back-up is fully adequate, the Service does not have significant provision for the supervision and editing of the pupils' workbooks which form a vital part of the integrated teaching package. It may be that additional appointments in this area would further strengthen the effectiveness of the operation.

Evaluation

Because of the compact nature of Hong Kong and the short distances involved and also because it was felt that the producers should be in direct contact with the users, no separate structure for evaluation was set up. The evaluation of the programmes is carried out on a five-pronged basis. Each producer is expected to visit at least one school each week to see a programme which he or his team has produced. Inspectors in the Education Department evaluate the professional content of ETV lessons in weekly reports, and assess student response to ETV in routine inspections of schools. The Service also uses compre-

hensive evaluation forms which have a remarkably high (90%) response rate. Finally the programme committee itself evaluates the programmes and produces comments.

As well as maintaining the overall effectiveness of the programmes, the main practical outcome of this process is to identify those programmes which need to be remade - normally between 20% and 30%.

Financial Implications

The Department of Education has a total expenditure in 1973/74 of some HK$ 700 million. This does not include expenditure on tertiary education, nor does it include capital expenditure. The Educational Television Service has at present an annual budget of some HK$3 million which is made up of some HK$2.4 million recurrent expenditure and HK$0.6 million capital expenditure.

It must be noted however, that the use of television is not designed to replace the teacher but to improve the quality of teaching. The cost of the Educational Television Service is in addition to the other costs of the Department of Education. It is only against improvements in the quality of the system that the ETV costs can be set. No economies in teaching personnel have been made.

The total costs for the building in 1970/71 including air-conditioning, amounted to some HK$3.2 million and the total equipment costs, including the stock of videotapes, were in the region of HK$4.08 million. The total recurrent costs of staff salaries in the first year of operations were estimated at some HK$1.6 million.

Capital expenditure is largely devoted to the purchase of television receivers. Government and government-aided schools were provided with approximately 1,000 television receivers in the year 1971/72. In the first year this cost some HK$0.98 million. Each television receiver serves two classes in primary schools, but, because these are bi-sessional, i.e. morning and afternoon schools, each receiver serves two schools and hence four classes.

Future Developments

In keeping with its stated policy of being 'an organic, continuous process' the ETV Service has formulated an ambitious and far-reaching plan for development. The next stage of growth will be the provision of programmes for the top class of the primary cycle, P.6. This will then complete the range of programming for primary schools, as it is not intended to have programmes for the first two years, P.1 and P.2. The first main objective of the ETV Service will then have been achieved.

The top primary class, traditionally examination-orientated in syllabus content and teaching approach, will provide a severe test for the ETV Service. The difficulties are appreciated and the Service is adopting a different strategy in its programme formulation. The television lessons will not necessarily follow the same approach - either in number, treatment or as regards the supporting material as those for P.3, P.4 and P.5. There will be an attempt to find a 'local' solution to this specifically 'local' problem.

Going beyond the primary system, considerable planning has already been undertaken on the introduction of television into secondary schools. A detailed survey was undertaken in all secondary schools to assess the desirability of having a service and attitudes towards it. This produced an 82% response - with the private non-assisted schools having the lowest response at 71%. Analysis of the responses has led to recommendations being drawn up for a phased introduction of ETV into the first three years of secondary school from 1975/76. The subjects to be covered and the duration and frequency of programming have also been identified.

It is already apparent that the secondary schools will present considerable administrative and organizational complexities. The variations between schools in their timetables, teaching cycles and the problems raised by summer/winter timetables, all militate against effective utilization. In order that these difficulties can be overcome, it is proposed to provide schools with video-cassette recorders in addition to television receivers. This will enable schools to record the programmes and play them back at their own convenience. Although video-cassette recorders cost more than receivers, it is assumed that the provision of a recorder will cut down the number of receivers required in each school and so reduce the total costs.

Anticipating a decision to expand the service to secondary schools, the ETV Service was forced to consider the problem of the acquisition of additional studio equipment and facilities. Conscious of the trends away from the continuing manufacture of monochrome equipment of professional broadcast quality, the ETV Service is proposing to acquire colour equipment. It is appreciated that it may be some time before funds are available to equip all schools with colour receiving equipment, but the proposal is seen as a safeguard

against obsolescence, even before the new equipment has been ordered.

THE SINGAPORE EDUCATIONAL TELEVISION SERVICE

Introduction

Almost without exception in every world-wide study of the use of television for formal educational purposes, reference is made to the ETV Service in Singapore. Although by no means the largest ETV Service - measured by the yardsticks of capital expenditure, recurrent budget or staff numbers - it has attracted considerable attention and commendation throughout its existence.

All educational innovation must be considered within the national context of the countries in which it is created. The entry in Part One of the Study provides a skeletal framework. Suffice it to say that Singapore is a small (225 square miles) island with a population of some 2,150,000 - 50% of whom are under the age of twenty. One of the major goals stated in the policy of the Ministry of Education is 'to provide the knowledge and skills necessary for the economic development of the country'. In order to meet the demands of its rapidly industrializing society, an 'improvement in the quality of education at all levels' has now been given top priority.

In 1956/57 an Audio-Visual Department was set up for the first time in the Teachers' Training College. This Department was mainly concerned with training teachers in such skills as the making of models for classroom use and the operation of projectors. The emphasis was on making and using teaching aids. At that time there was also a small educational radio service - under the control and operation of the Ministry of Culture. It was generally felt that this never provided a sufficiently effective educational service.

During the period between 1963, when the proposal for an ETV Service was first put forward, until its inception in 1966, it was widely believed that there was an urgent need for relevant, locally-based, instructional materials. This conclusion was reached during the consideration that was given to the educational system and its relevance to national needs following independence. After an appraisal of the alternatives, educational television was felt best able 'to collate and present materials related to the local environment'.

The Singapore ETV Service is still situated in the campus of the Institute of Education (formerly the Teachers' Training College), and it records ETV programmes on videotape for subsequent transmission by the national service, Radio Television Singapore (RTS). Transmissions are on Channel 8 between 7.50 a.m. and 5.30 p.m. during week days and between 10.00 a.m. and 11.15 a.m. on Saturdays. These transmissions can be viewed by members of the public on their domestic receivers as well as by school audiences.

The ETV Service is a branch of the Ministry of Education and is fully financed by Government. Salaries, production costs and other payments are met from the education expenditure of the Republic. In 1972, the last year for which figures are available, the recurrent expenditure of the ETV Service was S$479,000 as against a total expenditure on education of S$230,000,000.

Administrative Structure

The general policy of the ETV Service is formulated by a Committee composed of members appointed by the Minister for Education. The Chairman of this Committee is usually the Deputy Director of Education, and the Secretary of the Committee is the Head of the ETV Service. Among the members are the Director of Broadcasting or his representative from the Ministry of Culture and members drawn from the Ministry of Education, secondary school principals, the Adult Education Board and similar organizations.

This Committee, which normally meets at least once a year, advises the ETV Service on the following: the level of programming; subject areas; frequency of transmission; selection of language of instruction of school broadcasts; the convening of sub-committees and working parties to discuss syllabuses, evaluations, etc.

Under this Committee are a series of subject-based sub-committees with the specialist subject inspector acting as Chairman. Members of these sub-committees are drawn from principals of schools, lecturers from the Institute of Education, heads of departments and teachers. The producer from the ETV Service is normally the Secretary to this committee. Each committee discusses the content of each series and advises on the method of approach to be used in the programme. From this point onwards it is the responsibility of the ETV Service in general, and the producer of the series in particular, to ensure that the programmes are recorded

and the supporting materials, such as notes for the teacher, are ready in time. The role of the producer within the Service is that of 'an educational communicator', that is, someone highly specialized in the techniques of production but not necessarily a subject specialist.

The total staff is about fifty, including the Head of the Service and the Deputy Head. There are some sixteen production staff, eleven in the engineering section and nine in the graphics and photographic section. The remainder are concerned with administration and support services.

Training of Staff

Singapore has evolved techniques and set standards in the selection and training of the staff of the ETV Service that make it almost unique in the field of educational broadcasting. In most countries initial selection and recruitment of personnel is random and haphazard. Selection for particular posts normally occurs before training. The dangers inherent in such an approach are obvious - the skills required for effective ETV production are not necessarily those possessed by a good classroom teacher, an effective inspector or an able headmaster. To select staff on criteria other than aptitude is likely to be counter-productive. Aptitude can best be ascertained during and after training. Final selection is best made after training.

Prior to its inception, the Singapore ETV Service invited, through notices sent to all schools, practising teachers to apply for training. Only teachers up to thirty-five years old, with good qualifications and at least five years' teaching experience were eligible. The applications were then screened and most of the applicants were called into the Service and given tests designed to measure their visual, creative and writing skills. The most successful of these were then given training in an intensive series of courses designed to select those showing the greatest aptitude for educational television production. It was only after this process that identification and selection of staff took place. These people then received further training - subsequently reinforced with study visits and fellowships to overseas ETV organizations.

Having built a very solid nucleus of production staff after the original training and selection process, the Service can dispense with formal recruitment. Potential producers are now invited to join the Service - normally from the ranks of the many part-time script writers or presenters These script writers and presenters (who are also full-time teachers) are also subjected to scrutiny by the Inspectorate before being appointed. Since the ETV Service has equivalence with the teaching profession in terms of salaries and gradings there is seldom any problem of mobility either into - or much more rarely out of - the Service.

Although the recruitment of supporting staff such as graphics artists and photographers is handled by the Public Service Commission, nevertheless all candidates receive special practical aptitude tests devised by the ETV Service before being confirmed for selection.

The recruitment and training of script writers is one of the major problems of the ETV Service. Regular script writing courses for teachers are conducted as a selection device or a 'talent-spotting' technique. These courses, which are normally over-subscribed, are held in the teachers' own time.

The presenters of the ETV programmes are also teachers who have been identified - through rigorous auditions - and trained. The presenters, the actors and supporting players are drawn from schools. The ETV Service maintains a register of possible presenters and actors. Teachers from this register are called in to participate in the programmes as and when required.

Programme Production

For each series, a producer has the services of one production and research assistant. The scripts which form the basis for all the programmes are usually written by practising teachers and courses in script writing are conducted regularly for teachers. The producer, working with his or her production assistant, converts these scripts into camera scripts. The producer has final and absolute responsibility for the production, although in terms of programme content and approach, the Chairman of the sub-committee takes responsibility.

Each producer is responsible for the production of one-and-a-half to two series of programmes each year. Each series normally consists of twenty-eight programmes. This gives a work-load of around one programme per week per producer. This, although a heavy burden by most standards, is in fact a reduction from that met in the early days of the Service. The production load per producer normally consists of one completely new series and a remake of an earlier series. This would usually involve

revising anything up to 50% of the original series. After two years of use, it is the practice for the whole series to be remade - although some series, such as a recent one on junior science, have had a life of three years.

All the programmes are recorded in the rather small (24' x 30') studio of the ETV Service and three hours of studio time are allocated for each programme. This means that the studio is working constantly to full capacity and any unforeseen difficulties in terms of technical or production problems invariably result in considerable overtime work for the entire production team.

The facilities which are presently available for production are extremely limited. In the small studio there are only two cameras - both of which are fitted with turret lenses. The ETV Service does not have sound filming facilities. All locally shot film must be of the sound-over type. It is not at present possible to edit the videotapes effectively.

Against this background, and with a minimum of staff, the ETV Service produces a most impressive range of programmes, in terms of both quantity and quality. In one example which was screened, a programme from a new series for teaching Chinese as a second language, extensive and effective use was made of almost all the resources available to the television medium: film inserts - both specially shot and library material; dramatization; animations - both captions and diagrams; models; photo-captions - both locally shot and from library sources; and the judicious use of a presenter.

The Ministry of Education has installed one TV receiver in each school (both government and government-aided) in the Republic and a number of schools have acquired additional receivers to cater for a larger number of classes. The ETV Service now produces programmes from the first form of primary school right up to pre-university level. The extensive range of subjects covered is shown below.

ETV Service - Semester II, 1973

Subject	Language	Level
Social Studies	Malay	Primary 5
Social Studies	Chinese	Primary 5
Social Studies	English	Primary 5
Science	English	Primary 4
General Activities	Chinese	Primary 2
General Activities	English	Primary 2
Health Education	All Streams	Primary 3
Art	English	Primary 2
Mathematics	English	Sec.1
Mathematics	English	Sec.2
English as 2nd language		Sec.1
English as 2nd language		Sec.2
Chinese as 2nd language		Sec.1 & 2
Science	English	Sec.1
Geography	Chinese	Sec.2
English		Sec.2
Technical Education	English	Sec.1 & 2
General Paper	English	Pre-University

Transmission of programmes is repeated, up to eight times during the week, to help overcome timetabling difficulties.

In spite of its somewhat limited resources, the ETV Service does work in co-operation with the Adult Education Board and with TV Singapore in transmitting programmes in the early evenings for out-of-school audiences. In particular, the ETV Service is involved in teaching adults 'adult English'. The supporting commentaries for these programmes are either in Chinese or in Malay.

Support Materials

As part of the plans for the development of the ETV Service into an Educational Media Service, there has been increasing emphasis paid to the range of instructional materials produced to support the ETV programmes. Each school receives its supply of teachers' notes and supporting materials on the basis of one set per class using the TV programmes together with one additional set for the library.

The range of materials which the Service provides includes:

a) teachers' notes;
b) teaching charts in colour showing experiments in considerable detail e.g. technical drawing charts;
c) language tapes - especially for language drills;
d) pupil workbooks; e.g. workbooks designed for use on an experimental project in programmed learning in biology;
e) booklets for adult education - particularly on leisure activities e.g. the booklet accompanying a series on playing the guitar;
f) overhead projector transparencies, e.g. those produced to accompany a series on technical education;

g) multi-media kits which include booklets, posters, slides, cassettes, and most importantly, stencil masters which are designed to be used by schools for subsequent duplication. These multi-media kits are contained in well-designed and attractive packages.

The production of these materials is the responsibility of the producer and his or her assistant, although specialists may be called in to advise wherever appropriate. The recent attachment of the Media Section of the Ministry of Education to the ETV Service has greatly strengthened this side of their activities. The present policy followed by the ETV Service in producing support materials is that only prototype material is developed by the Service. Commercial firms are then commissioned to produce the material in bulk. The budget for producing this material is in the region of S$29,000 per annum which represents almost 30% of the total production budget. The expenditure on support materials is increasing year by year.

Evaluation

The ETV Service maintains an elaborate evaluation procedure which, although not measuring the amount of learning taking place, does provide the Service with an accurate picture of the reactions to the programmes transmitted. The basis of the evaluation procedure is an elaborate series of questionnaires which have been designed by the ETV Service in conjunction with the Inspectorate of the Ministry of Education, the Economic Research Centre of the University of Singapore and the Electronic Data Processing Unit of the Ministry of Finance. Of the 500 schools in the Republic, one quarter - or around 125 - are sampled each week. Every school is supplied with eight questionnaires to be completed by the teachers who have watched the ETV programmes. The return rate is in excess of ninety per cent. The returns each week are first checked by a member of the ETV Service. Any information of outstanding or immediate importance is then relayed to the producers. The forms are sent to the Electronic Data Processing Unit in order that the information they contain can be fully analysed. This analysis is then published regularly in the quarterly journal of the ETV Service 'ETV Singapore'.

In addition, members of the Audio-Visual Inspectorate, the ETV production staff and the general inspectorate periodically visit schools and watch classes using the ETV programmes. The ETV Service conducts seminars for the teachers using television in order to assess their opinion on programme content, syllabuses and utilization. The producers of the programme series together with the specialist inspectors, attend these seminars in order to answer the queries raised by the teachers and their principals.

In Term One, 1973, the number of pupils viewing the programmes ranged from a maximum of 25,357 for a Primary 1 programme, through 9,000 to 2,000 in secondary forms 1 and 2, and going right down to some 617 viewers at pre-university level. A study of the detailed evaluation responses indicates overall satisfaction with the programmes in terms of both technical quality and educational value.

In general, teachers' attitudes towards the Service and using television as an educational resource are favourable. Primary levels 2, 3 and 4 use it most and it is at these levels that the teachers are most favourably disposed towards it. It appears that the greater the pressures caused by examinations at any level in the system the less favourable are the teachers' attitudes towards using television as a teaching resource.

Effective utilization of ETV is very much more than ensuring that the school children physically see the programmes - it involves viewing in a climate and situation conducive to learning.

Instructional Materials Library

As a complementary service to the ETV operation there is an Instructional Materials Library which is mainly concerned with distributing 16mm and 8mm film to schools. Schools pay S$60 per annum for membership of this Library or S$100 for two schools (the morning and afternoon schools) housed in one building. Members of the Library are entitled to receive the multi-media kits from the media service free of charge.

Singapore Educational Media Service (SEMS)

At present plans are under way to develop the ETV Service into an Educational Media Service which will strengthen the work already started by ETV. This new Service will work towards the development of a wider range of educational media and media resources which are directly related to the school curriculum. Such media are expected to play an important role in the overall qualitative improvement of education. A major step in this development programme was the integration of the Ministry of Education Audio-Visual Inspectorate into the Educational Television Service. The procedures for the purchase and maintenance of audio-visual equipment were simplified.

The next stage in increasing the effective use of audio-visual materials was the development of a more positive attitude in both the Inspectorate and the schools. This was achieved through an intensive series of thirty-two meetings where all principals were brought together for discussions with the Audio-Visual specialists and other representatives of the Ministry. The next step is to formulate policy for providing in-service training in audio-visual utilization for teachers. In addition to co-operating with the ETV Service on television programmes, the audio-visual unit of SEMS will have its own production facilities.

Plans for Future Development

As far back as 1968, Dr. E. J. Meade Jr. of the Ford Foundation was able to state in a report that 'the present ETV Service is overloaded with work'. Dr. Meade also stated: 'the Service has a modest (all too modest, I must report) technical facility and operating budget'. Since then, both in terms of the work load carried by the members of the ETV Service and the quantity of output with the use made of available transmission time, the Service has reached saturation point. No more time is available for transmission. Every available slot in the morning session, i.e. eight transmissions, and every slot in the afternoon session - a further eight transmissions - is filled from Monday to Friday, and there are five transmissions on Saturday morning, making a grand total of eighty-five programme transmissions per week. Expansion can now only take place by either reducing the number of repeats or by adding a new channel for transmissions.

Following the preparation of the paper 'Educational Development in Singapore' by the Joint Singapore/UNESCO Study Mission in 1971, a further document has been produced, entitled, 'New Development Project Proposals for the Singapore ETV Service - Third Paper' This Paper outlines proposals for a significant development of the ETV Service. In association with the Centre for Production and Training for Adult Education Television (CEPTA) there would be a physical move into newly constructed premises and also a professional move into new areas of activity. In addition to the creation of the Singapore Educational Media Service, the new proposals would enable the Service to extend its range of targets throughout the educational system from pre-school through the formal school system into the areas of adult and non-formal education. Industrial training and non-degree university education are also fields that may be tackled. These far-reaching proposals will involve major developments in terms of facilities. The Service will move into a custom-built studio complex with some 75,000 square feet of floor space. There will be four studios with full colour television facilities; the Service will have its own transmitter; and an increase of staff will bring the total up to 110. In terms of production it is planned that by 1975 a series of 'integrated programmes' will be designed to support the introduction of a new primary curriculum. It is also planned that these developments will allow for the production of several series of programmes aimed at the general public with the youth audience being the specific target. This proposal is phased over a period up to early 1976.

UNIVERSITY OF GLASGOW TELEVISION SERVICE

Historical Background

Glasgow University is one of the oldest educational institutions in the United Kingdom having been founded in 1451. Through its seven faculties of arts, divinity, engineering, law, medicine, science and veterinary medicine it provides tuition for just under 10,000 students.

Most of the University buildings are in an area of about 50 acres situated fairly centrally within the City of Glasgow, which is an important industrial and commercial centre with a population of just under one million, but with an immediately surrounding population of about two and a half million. In addition to the central University precinct there are two major teaching hospitals, a number of related hospitals, a dental teaching hospital and a veterinary college spread throughout the city and its suburbs.

At a time of growing awareness in British tertiary level institutions of the potential of closed-circuit television as a teaching medium, the University of Glasgow set up a Senate Committee on Closed-Circuit Television in 1963. Preliminary consideration of television's teaching potential was encouraged by the attachment of an American educational broadcaster to the University as a Fulbright Scholar. At the same time the University appointed a Chief Technician to instruct and assist in the use of the limited equipment which had been acquired. There is no doubt that the later growth of the service owed much to this decision that professional and technical assistance should be offered to academic staff in their use of television.

During an experimental period of around eighteen months or so, television was tried out by several departments - ranging from

biochemistry through engineering and modern history to extra-mural lectures on fine art. On the basis of this experience, the University Court decided that a central Television Service should be established. This Service was to be responsible for meeting the television needs of any teaching department which required its facilities.

The first step was to appoint a Director to the Service. The importance of this appointment cannot be over-emphasized. The Director appointed had been a BBC television producer but, significantly, had been before that a university lecturer in psychology and education.

It was to the advantage of the Service that virtually no equipment had been bought and that only experimental work had been attempted. There was no need to adapt earlier systems, nor to unscramble temporary or other arrangements. The Service then undertook what was an obvious - but often overlooked - step. Using a combination of questionnaire survey and personal meetings, a study was made of the exact nature and extent of the demands which existed in teaching departments throughout the University. It was only on the basis of this information that it was considered possible to devise a system which would meet these needs with efficiency and economy. A pattern of development for the Television Service was then drawn up.

A permanent and fully equipped studio, with adequate videotape and telecine facilities was built to complement older facilities.

It was necessary to provide a central pool of television equipment for use primarily as a visual aid within the conventional university teaching situation. It was felt that this equipment should be capable not only of recording simple lecture and laboratory work, but also more involved situations, such as psychiatric interviews and bedside teaching. A cable distribution system was installed throughout the University.

A mobile unit, equipped with videotape recording facilities, was provided to meet a wide variety of overflow and relay situations and to collect teaching materials outside the University.

Throughout the planning stages, it was felt that the Service should be equipped to professional broadcast standards. This decision, of course, produced initial difficulties in arriving at an acceptable level of expenditure.

As a result of these developments, there was a steady growth in the number of departments using television and the range of work for which they were using it. Amongst the earliest users were psychiatry (for the relay of clinical interviews), geography (for overflow lectures), pathology (as a visual aid in the autopsy room) and chemistry (for recorded laboratory demonstrations) Less than two years after its inception, around sixteen different departments were making use of the Service. To support this growing activity, the staff, facilities and budget of the Television Service also increased.

Development of the Service

After two years of this level of activity, the Television Committee was reconstituted as a Joint Committee of Senate and Court of the University, with a senior professor as its Convenor. At this time the University Grants Committee - the UK agency responsible for advising on the funding of universities - stated in a memorandum that they envisaged the University of Glasgow, jointly with its neighbouring University of Strathclyde, as becoming a 'high activity' centre in the field of audio-visual aids, to give a central service to each university and to specialize in the medium of television. It was hoped that this centre would carry out research into the value and most effective use of television in university teaching and research and that in co-operation with other major centres of university activity, would plan research, offer training and produce material for inter-university exchange.

Within a year over thirty different departments were making use of the Service and the range of uses was categorized into eighteen separate types.

To provide this service it was found that the studio and mobile unit, which were now fully operational, were required to work to full capacity. There was an eight-channel distribution system installed throughout the main university campus and, with the phased acquisition of videotape recorders (beginning with three one-inch recorders in 1965 and rising to the current holding of sixteen, together with a two-inch videotape recorder obtained in 1967) the Service is able to meet most of the demands placed upon it.

With a total staff of 24 and an annual budget of about £74,000 which is about 0.7% of the total University budget of £10.7 million, the Television Service is now regarded as an accepted and integral part of the teaching activities. The pro-

blem of acceptance and recognition of the contribution of a television service to the work of a university by the academic and teaching members of staff has been central to its effectiveness in many institutions. The practice of the Television Service in Glasgow to give considerable attention to the recruitment of production staff has gone a long way to overcome this problem. In general, the producers are graduates who, because of their own background, are able to establish contact and gain acceptance at a professional level with their academic colleagues.

The Uses of Television

In the University of Glasgow, as in other similar institutions, there has been considerable debate about the relative values of the two main functions of television in teaching. It would perhaps be wrong to suggest that improvement in quality has always been the sole target. It is in the shadow of quantitative problems that the Television Service has been most urgently pressed into action - the need for 'overflow' lecturing or the pre-recording of lectures for repeated reproduction. In the mid-1960s there was a widely held assumption in the United Kingdom that cameras and videotapes might justify their costs by this relatively mechanical multiplication of lecturing capacity. It has never been the Glasgow view that television finds its ideal use in the relaying or recording of the straight lecture. Nevertheless practical problems have arisen within the University where television reproduction provided either the temporary or the long-term solution.

Lectures-by-Television

There have been three main, but significantly different, approaches to the lecture-by-television. The third of these was developed largely in the University of Strathclyde, but since the Television Service forms part of joint Audio-Visual Services for the Universities of Glasgow and Strathclyde and since this work is of considerable interest in its own right, it has been included in this study.

The simplest version of the lecture-by-television is the 'overflow' situation. As early as the autumn of 1965 a crisis situation caused by an unforeseen explosion of student numbers in the Geography Department involved the help of the Television Service. The lecturers still found themselves face to face with a large class in the lecture room while the proceedings were relayed live by television to a second lecture room. Various types of difficulty - staff illness or shortage or, timetable clashes - have been resolved by television overflow, either live or recorded.

The use of television in this way has not been universally acceptable, but in general and as far as academic results are concerned, there is no evidence that students receiving their lectures by overflow perform any differently from those who see their teacher face to face. Student reaction to relayed lectures has varied considerably. In some departments it has been consistently observed that, given freedom of choice, more students go to the television room than to the originating classroom. In another department there was criticism initially that the television coverage paid too much attention to the lecturer and not enough to his blackboard work. This criticism underlined the fact that television overflow - however routine and mechanical it may appear - demands sympathetic handling by a director whose first responsibility is to select and present to the student those elements in the total classroom situation which are at any one moment most likely to contribute to the teaching and learning process. In this classroom situation the lecturer's own style and delivery remain relatively unaffected, because he is as conscious of the students in front of him - and their reactions - as of the television cameras.

The second approach to the lecture-by-television is where lectures are given in a television studio and relayed or subsequently replayed in classrooms. This activity happens relatively infrequently. Several departments have used this approach to solve a temporary problem and seldom for more than a term at a time. Although reasonable satisfaction was obtained in most cases, the Service did encounter significant problems in using this technique in one instance - in fact, that occasion has been described as 'the most unsuccessful and most unpopular venture in which we have participated'. A series of thirty lectures was given in the studio and transmitted live to two large lecture rooms. There were two important factors which are considered to have contributed to this lack of success. The teaching staff involved (being anxious to have some form of student reaction) arranged to have a small audience of eight to ten students in the studio. The effect upon the lecturers seems to have been that they adapted their style to the small group, conveying a sense of exclusion to the much larger, remote groups. This, combined with the absence of staff supervision in the viewing rooms, produced bitter resentment in the students who felt that they had been 'deserted' by the teaching staff and that apparently preferential treatment was

being given to the selected few in the studio. Although this was an isolated case, it has acted as a firm reminder to the Television Service that the television lecture cannot always be used as a substitute for more traditional methods and for direct contact with students.

The third approach to the lecture-by-television is best illustrated by the work of the Mathematics Department in the University of Strathclyde - which is serviced by the joint Audio-Visual Services of the two universities. Strathclyde is a university with a technological bias and almost all first-year students are required to take mathematics. This placed a very heavy teaching burden on the Mathematics Department. It was decided that television would be used as a contribution to solving this problem.

Mathematics lectures are recorded in advance in the studio; there is no audience and the lecturing technique is direct-to-camera. Although there is no attempt to convert the lectures into 'television programmes' there is a substantial use of captions, models, animations - and occasionally - film inserts. The lectures are recorded and replayed to students in groups of about a hundred. Each recording consists of two or more sections of about twenty minutes' duration. Between these sections there is a break of several minutes used as a question and answer session under the guidance of a member of staff. Although these recorded lectures form the central core of the first year Mathematics Course, a set of detailed notes and weekly tutorials given by staff members to small groups are also essential and integral ingredients.

On the basis of more than five years' experience, it was recorded that:

> our main difficulties appear to have been overcome and the system, in which the direct teaching of mathematics to all first-year students is done by television, is running smoothly. We are satisfied that the students are receiving courses in mathematics which are at least as good as anything they had in the past and in many cases better. We have achieved very little saving of staff time, but we believe that the staff have been used more effectively. One big economy has been in the time of specialists, in particular of statisticians. Our very limited number of statisticians would have been quite unable to deal with the very large number of students requiring courses in statistics, without the aid of television.

Student reaction has been generally favourable. In commenting on the advantages of the system, students stressed that provision of printed notes made it possible to give full attention to the lecturer; that the notes are superior to those a student could make himself; that the classes are in general better behaved than in other lectures; that all students are treated exactly alike; that pre-recorded lectures make efficient use of the time and that alternative viewing times are available. From this it can be seen that student reaction is not narrowly confined to the television element. It is seen as an advantage of the television lecture that good detailed notes and more tutorial time can be provided. The release from purely repetitive lecturing has enabled these features to be developed.

Simple Visual Aid Uses

Within the University as a whole there is considerable use made of television systems as simple visual aids. A single overhead camera used to magnify and distribute detail of dissections, a camera used in conjunction with a microscope, are typical uses. As might be expected, the departments which make use of the Service in this way are those such as Botany, Zoology and Dental Anatomy. In the experience of the Department of Agricultural Botany, it has been found that using television has reduced the time in illustrating dissections by about 20%. The student's attention is more specifically directed to the material than when working with a demonstrator beside him. Both macroscopic and microscopic work can be shown easily and effectively. The students in this department say they like television and are benefiting from it. Although in another context it has been shown that the demonstration value of television for microscopic work is far superior to that of blackboard diagrams or projected photomicrographs alone, the best results were achieved by a combination of television and projection illustrations.

Relaying the Interview

A large proportion of the work of the Service is devoted to what is basically the relaying or recording of an interview situation. The interviews vary substantially in content. They range from the intelligence test administered to the pre-school child, to the bedside interview and to clinical demonstration. The Psychology Department uses television in test and interview situations and regards it as having a number of specific and positive advantages and no handicaps. It is invaluable for an interviewer or tester to have a record of his own behaviour and techni-

ques for objective study. There is an obvious advantage in being able to cater for a large 'eavesdropping' audience which need not in any way inhibit or embarrass the subject of the test or interview. Television techniques of this type have been found to be particularly effective when dealing with children who very quickly accustom themselves to the presence of the cameras.

The television techniques used in psychiatry are similar to those used in psychology. The clinical demonstration and the bedside interview between doctor and patient belong to this same category of activity. Recorded material has been found to be more effective than the somewhat uncertain and variable quality of live material. When used in the course of lectures, recorded material reinforces academic information with clinical examples.

Mobile Unit Work

The Mobile Unit of the Television Service is a custom-built unit with four cameras and capable of a considerable degree of sophisticated use. Varied activities have been undertaken which can best be described as providing additional material for undergraduate teaching which it would not otherwise be practical to offer at all. A study of industrial training methods compiled in a Clydeside shipyard; an objective observation of the use of a language laboratory in a secondary school; geriatric case histories compiled in the patients' own homes; observations in infant classrooms and in clinics for disturbed children are a few representative examples.

It is in the field of medicine that the Mobile Unit probably makes its most important contribution. The Department of Renal Medicine was able to videotape an interview with a patient undergoing regular dialysis treatment while he was actually attached to the artificial kidney. The Radiology Department uses the Unit to overcome the difficulties of shortage of accommodation and staff, and dangers of ionising radiation. The Mobile Unit has made over 30 videotapes for the teaching of clinical cardiology. These tapes have been used for undergraduate, postgraduate and in-service general practitioner training. The experience of the Department of Veterinary Pharmacology has shown that 'a high degree of expertise is desirable if the finished product is to be wholly acceptable. Ideally the demonstrators should rehearse carefully each stage of the programme before starting to make a recording'.

Special Uses

As well as the representative examples above, there are also some individual uses which are worthy of mention. The Departments of English and French have used the studio to record excerpts from plays which are prescribed texts for literature courses or are in some other way relevant to the teaching course. The School of Social Study makes re-use (with permission) of recordings made in other departments in order to study examples of a wide range of interview techniques. The School believes that the teaching of interview techniques can only be carried out by demonstration. The School also makes use of television in therapeutic community work.

Quantitative Aspects of Television

Although careful and accurate records have been kept of the work and output of the Television Service, it is very difficult, if not misleading or dangerous, to attempt to draw any blanket conclusions about costs or cost-effectiveness. As has been shown, the uses of the Service are so varied and the range and nature of the programme material so wide that comment can only be made on the separate uses of television. Simplest to assess are the costs and effect of 'visual-aid television'. This means that the Service installs, maintains and retrieves the cameras which form the central pool of equipment. The experience of the Service is that by using television cameras there is a reduction of something like 20% in demonstration time.

It is relatively simple to calculate the time involved in a straightforward, live overflow lecture. Even a conscientious academic will rarely spend more than 30 minutes discussing an hour's lecture. Here the major contribution of time comes from the television unit. Up to 10 hours of technician time (because several cameramen may be involved) and perhaps 1 hour 30 minutes of production staff time would be required. Although the overflow situation does increase the 'productivity' of the system, within Glasgow University this technique has largely been used to solve some quite acute and relatively short-term problems of staffing or timetabling rather than as a deliberate attempt to reduce costs.

In comparison with the overflow situation, where the lecture would have taken place anyway, the direct teaching approach of the Mathematics Department in Strathclyde University presents a very different set of figures. Here, although no great degree of sophistication was attempted, the lecture was planned to be delivered direct-to-camera and to be closely related to students' printed notes. This involved considerable planning and preparation. For one teaching hour, the lecturer spent between 7 and 10 hours preparing his material,

discussing it with the producer and rehearsing and recording it. The producer required 7 hours to discuss, plan, rehearse and record and the graphic artist required 13 hours. There were 21 hours of technical staff time involved in setting and lighting, rehearsing and recording. Against this expenditure of man-hours must be set the fact that some of the tapes have been produced for a potential audience which will never be less than 3,000 students. And this makes no mention of the qualitative effect on the teaching system.

The recorded demonstration presents another set of figures. A typical 15-minute recording of demonstration and instructions for laboratory work in the Department of Natural Philosophy required 12 hours of academic staff time, 12 hours of producer's time, 6 hours of graphic artist's time and a total of 30 man-hours of technical staff time. This 15-minute recording could have about 80 transmissions in one year and have a life of three years. The use of such recordings replaces 48 hours of demonstrator time per week for a period of 20 weeks in each year. It should be appreciated that using tapes for this purpose does not represent a loss of contact between student and supervising staff; in fact staff effort, released from repetitive demonstration, is available for more productive forms of supervision.

In the area of recording interviews, costs and the consumption of time can be extremely variable - the location and the hours in which it is accessible are the controlling factors. An 'average' figure for the simple two-camera coverage of a bedside-teaching situation lasting one hour may involve 10 technician man-hours, 2 - 3 hours of manual staff and 2 hours of producer's time. On the other hand, medical teaching which is prepared 'as television' in the studio may take far more time. One 6-minute recording of a specialized medical topic, involving a good deal of specialized equipment and precisely synchronized activity in the studio required 40 hours of technician time and about 4 or 5 days of producer's time. The two senior cardiologists who were involved had spent days on planning and preparation and each spent a complete day during the rehearsals and recording in the studio.

At the most expensive end of the scale a complete mobile unit was sent for several days at a stretch to record group therapy work in an outside institution. The final ratio was 50 technician hours and 10 producer hours for each hour of material. These figures are very modest when compared with those of the most ambitious of the studio presentations for the literature departments. A 50-minute recording of The Duchess of Malfi required 218 technician hours; 79 hours of designing and set construction; 28 hours of assistant producer time and at least 50 hours of producer's time.

These last two undertakings are exceptional, but still part of the total picture. Projects which are expensive in time have to be scheduled outside the academic term when other pressures would make them impossible. The value of a centralized service for the whole University which can use otherwise slack periods in the teaching year is here apparent.

In the University of Glasgow, television is regarded as a central service and in that sense is available 'without charge' to teaching departments. The allocation of resources is on a day-to-day basis by the Director, under the guidance of the Television Committee. Where there have been external requests for material and other facilities, charges are made at cost.

Research

Although the Service has not undertaken any programme of formal research there has been continuous observation and assessment of the various uses of television. In addition to staff assessment, students' opinions and attitudes have also been canvassed and measured. In the University, television has often been seen as offering the solution to a practical problem; because television has obviously been a solution and because the problem has been an urgent one, the obvious line of action has been to go ahead with the use of television rather than to create comparative situations which would yield quotable research findings.

One general point which has emerged time after time in comments from teachers in all faculties is that there is virtually no situation in which television should be regarded as a sole medium of instruction. It is a satisfactory medium for the lecture - but only if there are other contacts with the student. It may carry a whole course of lectures, but only where there is an integrated system which includes the issue of printed notes and regular tutorials. As a visual aid television has not superseded the blackboard and projected illustrations, but has taken its place along with them.

* * * * *

The first, and perhaps most important, common factor in these studies is that in each case the television service is fully under the control of the education authority and forms an integral part of the

education system. There is no division of control or loyalties. Staff are employed on a full-time basis by the education authorities. Technical as well as production staff are involved, although in the case of Zambia, engineering and other studio staff are provided by the national broadcasting service. In this type of situation 'service' has its full meaning, as all activity can be directed to the needs of the educational system.

Although television is often described as a mass medium and viewing figures of over 500,000,000 have been recorded for occasional international events, this study would seem to indicate that it is most effective when used over a comparatively small physical area. There appears to be a number of reasons for this. The first is technical - it is easier, more reliable and cheaper to cover small distances than large ones. The second is more far-reaching and is concerned with the need to make provision for effective classroom utilization and evaluation. Television provides a one-way flow of information to the classrooms. A mechanism to provide contact between the users and the producers must be created, wherever possible, by personal liaison. It is much easier to establish an infra-structure to achieve this in compact areas. A third factor, related to the first two, is that of maintenance of receivers. Whatever system of maintenance has been devised - and the need for a system is important - it has been found that whenever breakdowns occur, users first make contact with the television service. It is important that the service can then respond rapidly. Here again small distances make for easy communication and action.

The realization that 'educational television' is much more than equipping and manning a television studio is a lesson to be gained from the services which have been studied. Production is important but just as vital - if not more so, since this is the justification for its existence - is reception. Responsibility for this has been accepted fairly and squarely by the services. The provision of receivers with arrangements for their maintenance and installation is most important. An authority which commits itself to establishing an ETV service without ensuring adequate provision for receivers in its own schools betrays a lack of confidence in its judgement to use television. Hong Kong has provided one television receiver for every two classrooms and up to ten receivers per school.

The scale of activity is also important. If a service is so restricted in its output that it makes no impact on the educational problem which it has been set up to solve, then its existence should be queried. Television is capital-intensive and output should be as high as possible. In this respect all three studies showed that saturation point had almost been reached in terms of available facility, studio and transmission time.

Although television programming was the main element in the projects described, their effectiveness has not depended on this alone. Nowhere was television used in isolation. In Glasgow University, the human presence was important, in Zambia the supporting notes were eagerly sought and used - even when the television programmes were not taken. Hong Kong produces both teachers' and pupils' booklets for all programmes and Singapore is developing an ever-increasing range of supporting materials. This trend is fully reflected in the Chapter on Teaching Resources. The time has passed when the 'television programme' can be considered as an educational entity. Taken out of its educational context and without its supporting material it is no more relevant or valuable than one piece of a jigsaw puzzle. Because of this it is extremely difficult to compare the 'quality' of television programmes from different services. One noticeable feature which the services showed was their insistence on as high and as professional standards of equipment and operation as were consistent with funds available. It was felt that if the technical quality of output were sub-standard, this would devalue the professional content.

In all the services studied, with the exception of Zambia, the output was exclusively of local production to meet local needs. International transfer of complete programmes was not considered satisfactory - particularly at the primary and secondary levels. Modest use was made of film inserts acquired from outside sources, but in general it was felt that whenever possible local resources should be used.

Because its products are open and exposed to comment, an ETV service requires competent and capable staff. The services see recruitment and training of staff as being of major importance. The identification and appointment of the senior personnel who have developed the services have undoubtedly contributed in no small measure to their success. The influence of staff on developmental activities - particularly executives - is difficult to quantify or describe but is nevertheless consistently present in successful projects. It is a factor which planners should not overlook.

The demands of running an ETV service are not those of running other departments or

activities in educational systems. Administrative procedures which are adequate for most purposes can easily choke and stifle their work. It is noteworthy that each of the services has been able to devise procedures which allow sufficient freedom of action and latitude in expenditure to enable them to carry out their work effectively.

No matter how much money, time, care and effort is put into the creation and production of television programmes, all is wasted unless they are used in the classrooms. Classroom utilization is of crucial importance. It is this area above all others that demands most attention. It is here that weaknesses invariably occur. Even at university level, the relaying of a live lecture to an adjoining room needs the presence of some form of supervisor. The attitudes of teachers are an important factor in effective utilization. This is fully appreciated by the services studied which have all made extensive and intensive efforts to 'involve' the teachers. Contact through courses in utilization, visits to schools, visits to the studios, through professional associations and committees, through journals and leaflets and also through regular use of evaluation forms has been established and maintained. It is worth noting that here again, small distances assist considerably.

It is appreciated by these ETV services that the best way to ensure that their work is effective is to make it attractive, relevant and useful to their colleagues.