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Ferrer, D.C.

1966
Johannesburg College of Education
https://hdl.handle.net/10539/27429
Ferrer, D.C. (1966). Recent developments in the use of audio-visual aids overseas. Symposium: A Journal of Education for Southern Africa, pp. 48-51.

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Recent Developments in the use of Audio-Visual Aids Overseas

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INTRODUCTION

IN October–November of last year I spent six weeks in Europe in order to bring myself up to date with recent developments in the use of audio-visual aids in education and in training, with particular reference to the application of C.C.T.V. and Programmed Learning. Time did not permit me to devote any attention to developments in the language laboratory field. However, during the tour I gained the impression that generally language laboratories have been accepted in Britain as having a high value as an aid in language teaching.

CLOSED CIRCUIT TELEVISION

The most spectacular developments recently in Britain have been in the development of E.T.V., particularly in the closed-circuit field. For the benefit of those who are not familiar with T.V. I think I should explain that closed-circuit television is a system in which television signals are transmitted to a restricted audience by means of a cable or a micro-wave link between transmitter and receiver.

C.C.T.V. is being used increasingly in universities, teachers' colleges and technical colleges. A start has also been made in the secondary school field. During my comparatively short visit I was fortunate in being able to see C.C.T.V. in use in all these fields, for I visited Leeds University, Glasgow Education Authority, Plymouth College of Technology and the Warblington School.

Research at Leeds University

In the field of higher education the research being undertaken at Leeds University is most exciting and interesting. It covers most facets of university teaching and through its Institute of Education and its Department of Education it embraces the training of primary and secondary teachers. I was most impressed by the breadth and depth of the research at Leeds. The researches include:

(*a*) the use of C.C.T.V. in the Training of Teachers;

(*b*) research at the Television Centre of the University of Leeds in the use of C.C.T.V. in teaching in institutions of higher education;

(*c*) the research in the Department of Education on E.T.V. in Schools and the influence of T.V. on the school child;

(*b*) research in the School of Medicine on the use of C.C.T.V. in the training of doctors;

(*e*) research in the School of Engineering on the comparative efficiency of C.C.T.V. and of the use of Programmed Texts combined with traditional Audio-Visual Aids;

(*f*) research by a university Committee on Teaching Techniques in the use of C.C.T.V. in the training of university teachers;

(*g*) research planned in the Institute of Education on Team Teaching (which makes use of C.C.T.V.);

(*h*) the planning of a One-Term Course for experienced serving teachers on the production and reception of educational television programmes by schools.

The foregoing illustrates the wide field being covered by the researches. They have been very carefully planned in detail and in depth. The researches on the use of C.C.T.V. in the Training of Teachers is a good illustration of the thought and planning which preceded them. They are being carried out using five teachers' colleges and under the following main headings:

(*a*) The use of C.C.T.V. in professional aspects of a teacher's training.

(*b*) The use of C.C.T.V. in the general education given in a college of education.

(*c*) The use of C.C.T.V. as a means of extending the range of the best lecturers in colleges of education at a time of national shortages.

(*d*) A comparative study of the efficiency of C.C.T.V. and other methods used in the training of teachers.

(*e*) The economics of C.C.T.V. when used in the training of teachers.

(*f*) The effect of the use of C.C.T.V. on the development of a new understanding of the teaching-learning situation and of new educational insights.

The Plymouth College of Technology Experiment

The experiments in the use of C.C.T.V. in technical teaching which have been carried out by the Electrical Engineering Department of the Plymouth College of Technology demonstrate the contribution which this medium can make in the field of applied science. The College provides full-time courses for London University degrees in many branches of science and engineering and for Diplomas in Electrical Engineering. The requirements of these courses, together with those of television broadcasting and television engineering courses, justified the development of C.C.T.V.

The Department, working within the limits imposed by a very restricted budget, developed equipment for engineering experiments which eventually proved their worth for actual programme use. The situation at Plymouth was unique in that the College started with the equipment rather than with the need to use it. Thus the approach has been one of pure experiment whenever a suitable situation or possible need arose. C.C.T.V. has been used mainly in the Department:

(*a*) as a means of allowing a number of students to see into:

(i) a confined space, e.g. the inside of a radio receiver;

(ii) a dangerous space, e.g. close to a radioactive source in the Nuclear Physics Laboratory;

(iii) an inconvenient space, e.g. in the test-cell of a gas turbine where the noise level is very high;

(*b*) as a vision or magnifying aid, for the viewing of small objects or intricate techniques.

A development of the Plymouth scheme has been the provision of an experimental service to schools in the Plymouth area. This has been achieved by the establishment of a studio at the College and a micro-wave link to a nearby B.B.C. transmitter. The College is also providing courses for teachers, each of one week's duration, on *Television Techniques for Teachers*. These courses are designed to provide an introduction to the use of C.C.T.V. in schools, colleges and universities. The prospectus states, "It is hoped to give those who attend an intimate knowledge of the operation, educational potential and accompanying problems of using C.C.T.V. both on a limited scale as an aid to vision in a normal class or lecture room situation, and in a more sophisticated studio-based production distributed to a number of receiving points. As much time as possible will be devoted to practical work which will allow members of the course to participate in every aspect of the preparation and recording of a television production." This extension of the College service to schools and the provision of courses for teachers is a most interesting facet of the Plymouth scheme. It shows that the electrical engineering department of a college of technology provides a good environment for the development of C.C.T.V. as a teaching aid. It also shows how the experience and expertise gained in the use of C.C.T.V. in one type of institution can be made available to teachers and lecturers in other institutions.

The Glasgow E.T.V. Scheme

The Glasgow Education Department's Educational Television Service includes a central studio linked by cable to 300 schools and 10 technical colleges. The service, which started in September, 1965, provides direct instruction in certain primary and secondary school subjects. It is obvious that one of the main aims of the service is to compensate for lack of specialist teachers. When I visited Glasgow in November last year the service was providing an introductory course in French for primary pupils (9-year olds) and a first-year course in *new mathematics for high schools*. Two channels have been provided by means of cable links but the system is capable of having two additional channels superimposed. In November, French lessons were being transmitted four times a day (220 classes) and the mathematics programme five times a day (200 classes).

A striking feature of the Glasgow scheme has been the co-operation received from the teachers. This has been achieved by placing the selection of subjects, the preparation of scripts and the presentation of programmes in the hands of teachers. The co-ordination of the teachers' work and steering it through the technicalities of production is the responsibility of the E.T.V. staff. Programmes are recorded *after* school hours on a video-tape

recorder and are then transmitted *during* school hours.

The Glasgow scheme succeeds in extending the services of first-class teachers to a large audience. This also provides a subtle and very effective form of in-service training. The success of the Glasgow scheme will probably stimulate the establishment of similar systems by other local education authorities in Britain.

The Warblington Experiment

The Warblington experiment, which was designed to investigate the use of C.C.T.V. in secondary education, over a three-year period, came to an end in September, 1965. The experiment was carried out in three phases:

Phase I, covering an academic year, in which the equipment was initially confined to one classroom which at a later stage was linked to a second classroom.

Phase II, also covering an academic year, saw the provision of a well equipped studio linked to three neighbouring schools by means of land-line.

Phase III was concerned mainly with the objective assessment undertaken in close consultation with the National Foundation for Educational Research.

A comprehensive report on the Warblington Experiment has been published by the Hampshire Education Authority. The 'Conclusion' of the Report reads:

"C.C.T.V. is a valuable aid to teaching and ranges from small scale applications to the operation of a studio relaying programmes with a local flavour to a large number of institutions. For students in training, class observation and child study facilities can be provided. A training studio is necessary to develop the techniques of television teaching. Salient administrative considerations are finance, staffing and technical maintenance. The educational position is that most pupils gain information from the screen at least as easily as they do in the classroom, and under some conditions the evidence is certainly in favour of the use of television. With teacher preparation and follow-up work, television can be very effective. Inasmuch as teaching is more than presenting information, the tutorial relationship in the classroom will continue; when large viewing groups are used more staff could be available for this vital tutorial role. The degree to which the potential growth of C.C.T.V. will be realised in the educational field depends upon the opportunities available to teachers and students to develop the type of knowledge and experience described in this report."

Equipment

The most important development during the past twelve months has been the availability of a good quality videotape recorder at a reasonable price. VTR's have been available for a number of years, but their high cost precluded their use in E.T.V. Some years ago I enquired about the possibility of obtaining a videotape recorder for use in our Rhodesian broadcast education television scheme. If I remember rightly the quotation was of the order of R24,000. However, during the last year a good quality videotape recorder has been made available at a price less than R1,600. This places it within the means of many education authorities and institutions. The great advantage of the VTR is its immediacy, that is, the picture can be played back immediately. When programmes are recorded on film there is the problem of processing the film which involves additional cost and causes some delay. Moreover, the video tapes can be used over and over again, that is, they can be wiped out and re-recorded. I am convinced that the availability of the 'low-cost VTR' will provide a considerable stimulus to the use of C.C.T.V. in education.

C.C.T.V. Summary

The value and potential of C.C.T.V. in education are manifest. In teacher training it has been demonstrated quite clearly that the use of C.C.T.V. is an invaluable aid. Perhaps I could sum up by stating that I feel the main functions of C.C.T.V. are in:

(*a*) the conservation of specialist and good teachers/lecturers, i.e. by extending their services to a wide audience;
(*b*) the demonstration of detail to a class or to a wide audience;
(*c*) the bringing of remote objects or dangerous or noisy experiments into the classroom/lecture theatre;
(*d*) the professional training of teachers.

PROGRAMMED LEARNING

The use of programmed learning in education has made progress but on a less spectacular scale than C.C.T.V. Generally it has made greater strides in Commerce, Industry and the Services than in Education. For example, British European Airways employ the full-time services of four professional programmers. In education, technical colleges appeared to make greater use of P.L. techniques than other types of institutions. I visited one training college for technical teachers where the techniques and applications of P.L. were included in the curriculum. This college also runs vacation courses for serving teachers. I think it is only fair to point out that generally technical

subjects lend themselves very readily to programming.

Many leading educationists in Britain are convinced that P.L. has tremendous potential in many areas of education. In view of this it is surprising that it is not being used on a greater scale. The main factors inhibiting its use are: first, the lack of suitably constructed and validated programmes; second, the fact that teachers have not yet accepted the use of programmed learning as a normal teaching method. In this respect it is relevant to point out that the Brynmor Jones Report only "recommended" that universities and training colleges should carry out research into the possible use of P.L. Constructing and validating programmes are time-consuming and costly processes which are generally outside the capacity of the full-time teacher. A number of universities in Britain have been engaged on the construction of programmes during the past few years and some of the programmes have been or are about to be published. In this connection I understand that Dr. Austwick's 'O' level mathematics programmes will be published shortly. Some of the manufacturers of teaching machines are placing considerable investment in the production of programmes. However, although this is a step in the right direction, I feel that significant progress will not be achieved until a majority of teachers has accepted P.L. as part of their stock-in-trade. I suggest that this position will not be reached until the principles and applications of P.L. are included in the curriculum of all institutions concerned with training of teachers. In the interim it should be possible to interest teachers in P.L. by the provision of courses designed to acquaint them with its uses and techniques.

An interesting development has been the establishment of the Centre for Research and Documentation in Programmed Learning at Birmingham University. This has been made possible by means of a grant by the Department of Education and Science. One of the chief roles of the Centre is the co-ordination and dissemination of information about P.L. Periodically the Centre will publish lists of educational programmes available.

Teaching machines are being increasingly used in Commerce and Industry but are not much in evidence in the schools. There is a wide range of teaching machines available in Britain, from the simple 'board' type, costing a matter of shillings, to the complex electronic machine running into several hundreds of pounds. It seems unlikely that they will be used on a large scale in schools in the foreseeable future since it has not been shown that they are more effective than programmed texts. I was advised that no evidence has yet been adduced that teaching machines provide greater motivation than programmed texts. However, the experience in one area suggested (but did not prove) that the use of teaching machines stimulated interest in the cases of below-average children and children in the lower age groups.

While in Britain I saw two new teaching machines, namely, T.M.1024, which was developed originally at the National Physical Laboratory, Teddington, and the Philips EL9000. The T.M.1024 is a binary branching machine which has interesting possibilities. Through the courtesy of several concerns I was able to see programmes which had been constructed for specific training situations. Two interesting features of the Philips machine, which can be used either for linear or for branching techniques, are the use of microfiche for the programmes and the provision of a response unit. Each microfiche, which measures 5 in. × 5 in., accommodates 198 frames.

With regard to the use of Programmed Learning and Teaching Machines in Higher Education, it is appropriate to quote from the Brynmor Jones Report, para. 387 of which reads:

> "We are satisfied that programmed instruction, provided it is well-conceived and carefully tested, has a considerable part to play in higher education. We recommend that universities, teacher-training colleges and technical colleges should carry out research into the possible uses of programmed instruction in their respective spheres and on the techniques of applying it. Such research should include computer-based teaching machines, and should involve the use of programmed instruction as part of the planned application of educational technology as a whole. The possibility of using these new and powerful tools to make the maximum and most efficient use of teaching staff in a period of rapid expansion should constantly be borne in mind."

CONCLUSION

In this electronic age a wide range of audio-visual aids and automated teaching and learning techniques is available to us. In essence they are aids to the communication of ideas, that is, aids to learning and to teaching. Experience overseas shows unmistakably that these aids can improve the quality of instruction and minimise the effect of staff shortages. Their efficacy has been proved; the problem is to determine the areas in which they can be applied to best advantage.

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