WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTÉ

ET/SG/71.4

ENGLISH ONLY

STUDY GROUP ON THE VALUE OF THE PROGRAMMED COURSE IN MEDICAL EDUCATION

Geneva, 23-29 November 1971

Agenda Item 1

INDIVIDUAL LEARNING PROGRAMMES

Analysis and Summary of Replies to a Questionnaire

Prepared on behalf of Dr. Arthur Sackler, Chairman, International Task Force on World Health Manpower for the World Health Organization

A questionnaire on individual learning programmes (ILPs) in English and French, was sent to the deans of 700 medical schools throughout the world. By 8 November, a total of 120 replies were received from 41 countries, with 75 of the replies originating in developed countries and 45 in developing countries. Of the 120 medical schools reporting, 67 schools indicated ILPs in current use. 14 out of the 45 schools in developing countries or one in three schools reported use of ILps, while in the developed countries the ratio was two in three or 53 out of 75 schools.

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Of the 67 schools, 30 reported the use of ILPs in more than one department, with a maximum of 5 departments per school. The following 29 different departments were listed individually:

Anaesthiology, Anatomy, Behavioral Sciences, Biochemistry, Biomedicine, Biophysics, Chest Diseases, Dermatology, Medical Technology, Gynaecology, Histology, Medical Education Research, Medicine, Mental Health, Microbiology, Neurology, Morphology, Norsing, Obstetrics, Paediatrics, Parasitology, Pathology, Pharmacology, Physics, Physiology, Psychiatry, Social and Preventive Medicine, and Surgery.

The five departments making maximum use of ILPs are: Anatomy, Physiology, Histology, Pathology, Obstetrics and Gynaecology in that order.

Schools which do not have ILPs, but are interested in their use, indicated the following 17 departments as prospective users:

> Anatomy, Biochemistry, Biophysics, Gynaecology, Histology, Medicine, Microbiology, Morphology, Neurology, Obstetrics, Parasitology, Pathology, Pharmacology, Physiology, Psychiatry, Social and Preventive Medicine, and Surgery.

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"Non-availability of individual learning materials" and "adequacy of existing teaching methods" were the two main reasons given by the majority of the 53 schools at present not using ILPs.

Six of the 53 schools without ILPs showed a definite lack of interest for ILPs while 35 schools were interested in trying them out. Sixteen of the 35 schools interested in trying out ILPs listed a total of 90 individual departments in which the introduction of ILPs would be welcome; 10 additional schools noted merely interest for "most" or "all" departments.

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28 out of the 67 schools with ILPs replied that their staff would be prepared to devote time to the preparation of their own future programmes.

As to the origin of the ILP material in use, the following information seems to be relevant. In 40 cases, the material was obtained from faculties or departments; in 44 cases from commercial sources, and in 45 cases from both of these sources.

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As to the current use of ILPs, the material prepared in the majority of cases by faculty staff consisted of:

audio-tapes (in 32 instances)
text alone (in 31 instances)
printed illustrations alone (in 29 instances)
projected slides alone (in 55 instances)
programme instruction books alone (in 28 instances)

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Audiotapes supplemented with slides, films, film loops, illustrations and TV, were reported as being used in 64 schools or departments; text supplemented with audiotapes, slides, film, illustrations, specimens, videotapes, models and X-ray films among others in 41 cases; printed illustrations supplemented with text, audiotapes, specimens, etc., in 16 cases; projected slides supplemented with text, audiotapes, work books, models, etc., in 44 cases; and other media, such as videocassettes, 8 and 16 mm films, super-8 mm films, close-circuit TV, teaching machines, etc., in 73 cases.

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The survey revealed that learning material had been prepared as an extension of conventional methods of teaching in 97 instances; in 30 cases, it was prepared as an innovation. In 51 cases, tests were performed for efficacy on successive student groups. In 40 cases programmes were modified as a result of these tests until it enabled the target group to attain the specified objective. In 83 cases, ILPs have been proven successful with evidence of student acceptability of the individual learning method, while 24 cases were listed as not successful. Evidence of student acceptability of the individual learning method was based on demand expressed by students, oral and written feedback from students, examination performance, better grades, observation of student use, good attendance, and usage pattern.

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Only 45 out of the 67 schools which had ILPs in use reported on the number of learning programmes in regular use. The 45 schools with 89 departments, accounted for 1136 individual programmes. Not included in this total are 600 tape slide shows listed by the McMaster University Medical Faculty in Hamilton (Ontario), Canada, with their medical education programme designed as a multi-departmental integrated one rather than one based on courses offered by respective departments. Also not included in the total of 1136 individual programmes are over 250 videotaped programmes of the University of Texas Medical School in San Antonio (Texas), USA, which maintains a videotape library and published a computer-based catalogue for 1970/71 of the videotapes that are available on a "demand access" basis on any of the three channels of the closed-circuit TV. The circuit serves the Medical School, the School of Nursing, and the Dental School. Most of the tapes were produced in the studios of the University. These tapes may be viewed on any of the 65 monitors located in the various schools and at Bexor County Hospital. The charges for the production of videotapes are six dollars per hour to faculty and staff, unless special art work or visual aids are required; there is no charge for video playback. The TV time schedule during the week is from 8a.m. to 11p.m., and on Saturday and Sunday from 3p.m. to 11p.m.

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The subjects of the over 250 programmes range from "abdomen" to "veterinary medicine". The videotape on the abdomen is a presentation of the general features of the anterior abdominal wall, together with instructions for its dissection. Following the reflection of the anterior abdominal wall, a demonstration is presented on the general topography of the abdominal viscera and peritoneum. A fetal dissection illustrates the origins of the umbilical ligaments. The videotape is in colour and lasts 20 minutes.

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The total of 1136 individual learning programmes, as reported from 89 departments of 45 medical schools, had the following distribution: 62 schools or departments reported below 10 programmes each; 12 between 10 and 20 programmes; 11 between 20 and 40 programmes; and four schools or departments between 40 and 120 programmes.

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As to accommodation for the ILPs, 79 faculties or departments indicated that study carrels or booths were used at the school or faculty itself; 52 faculties or departments reported that such facilities were used by students outside the faculty or school. In 31 cases, the accommodations were the choice of the students, in 47 cases that of the faculty, and in 11 cases the choice was made by both students and faculty.

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Regarding the time length of the employment of ILPs, the following replies were received: 105 schools or departments reported their use for the past 1/2 to 5 years; 17 for 6 to 10 years; 9 for 11 to 20 years, and 1 for 25 years.

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A system of exchange of ILPs with other faculties or departments exists in 84 schools or departments, while 51 schools or departments do not have such a system. 84 schools or departments would be willing, in the absence of a system of exchange, to seek an exchange, while 6 schools or departments answered negatively.

130 schools or departments contemplated to extend their programmes. As examples of planned programme activities, the following were most frequently mentioned: large-scale production of proje tion slides, increased use of audio- and videotapes and audio/slide programmes, use of more films, cooperation with other schools to obtain videotapes, acquisition of programmed instruction books, installation of slide and film libraries, enlargement of tape library, production of single concept movies, etc.

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In addition to replying to the questionnaire, a few schools sent material describing in detail activities concerning ILPs. Some examples of this type of information might be found interesting in the context of this survey. The University of Missouri-Columbia Medical Center reports about the Educational Resources Group which is composed of professionals in educational media, medical education, message design, instructional evaluation, and technical production. The major concern of this group is quality educational experiences for students in medicine and the related health science programmes of the Medical Center. Its major goal is the systematic development and evaluation of instructional strategies and learning materials. The Educational Resources Group is organized into four areas. Each area has discrete responsibilities but related to each other area as necessary to implement the overall programme of instructional development. The group concept allows Medical Center Faculty members or resource persons from the campus to be added for short-term assignments according to current needs.

The Educational Research and Development Laboratory of the Educational Resources Group provides self-instructional learning materials including audiotapes, 2 x 2 colour slides, coordinated tape/slide presentations, videotapes, printed materials, motion pictures, overhead transparencies, and computer-assisted instruction. The activities of the Laboratory are complemented by the Medical Educational Services which include medical illustration, still photography, motion picture photography and close-circuit TV.

The evaluation of programmes in health science education is a particularly critical task. In collaboration with faculty, the evaluation staff can assist in developing systems of evaluation at various levels. Evaluative criteria and methods can be designed to investigate course function, the effectiveness of various teaching and learning modes, approaches to curriculum organization, and learner achievement. More specific projects include: descriptions of the learning styles of medical students, development of non-content testing systems for predicting the success of students, evaluating the effectiveness of several courses, and the development of pools of examination items for various tests. Staff members are also designing systems of analyze student-performance on a short term basis as well as in a longitudinal context.

Another component of the individual learning programme, "Medical Educational Services," complements the work of the laboratory by taking care of medical illustration, still photography, motion picture photography and closed-circuit television.

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The Michigan State University College of Human Medicine maintains a Medical Media Center, responsible for the production of audio-visual aids to instructions and for securing material from commercial sources. It is capable of producing audiotapes, slide-tapes, printed illustrations and TV tapes. The material is in most cases prepared as an extension of or as supplementary material to the conventional methods of teaching. 40 self-tutorial carrels are available, accommodating close to 200 students.

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The following items are cited from the report of the University of Newcastle-upon-Tyne:

- Every student who uses one of the tape/slide lecturettes is asked to comment on it and action is taken either to withdraw material or to modify it as a result of these comments. We have not tested them objectively but they are very acceptable to students as a result of which the facility is being extended. It is also used in the postgraduate field.

- ECG programme is a branching programme and it was validated and modified objectively using a series of students. Its efficacy has been tested against the same material given in lecture form and in the form of a programmed textbook. The results have been published.

- Conventional teaching is designed to cover most of the material required of students but that the individual methods are available on a 24-hour basis for any student who wishes either to add to his knowledge or to revise his knowledge.

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The College of Physicians and Surgeons of the Columbia University in New York reported a great use of photography in medicine and pathology, heavy use of films, models and specimens in anatomy and surgery. Videotape in rehabilitative medicine was found to be the best medium for teaching procedures and analyzing patient progress. A centralized Audio-Visual Department to serve all departments will begin production of slide/audiotape lectures and films for super-8mm cartridge distribution in the very near future. Slide/audiotape lectures are for carrel use; super-8mm cartridge films for individual projection; and films are to be produced and distributed to group viewing in 16 mm. Black and white television production is now being centralized and tapes will continue to be made, especially in the areas where procedures need to be illustrated, viz. nursing, medicine, pathology, rehabilitative medicine. A new colour television system will be operational within the year. A library of tapes will be collected at the school and, if requested, distributed internationally.

The individual learning stations, throughout the college and in various areas of the hospital, will eventually be equipped with television cartridge playback units. This will be in addition to the slide/audio tape lectures, the super-8 mm cartridge films, and the models, charts, and specimens that are installed in the stations now.

Eventually, over 70 per cent of the materials used at the school are to be produced "in house". But it is hoped that channels will remain open between all higher institutions for the exchange of value software/programmes.

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St. Bartholomew's Hospital Medical College, West Smithfield, England, reports a considerable growth of interest in the use of audio-visual teaching methods. A study has been made of the various media relating to educational value, financial implications involved in the purchase of initial equipment, servicing, production of programmes, broadening clinical curriculum, burden placed on teaching staff in regard to both curriculum and increasing number of students, and particular needs of the hospital and medical college. It results from the study that the best contribution can be made by concentrating resources on the development of a teaching laboratory utilizing tape-slide self-instruction methods for imparting factual information. This should achieve a number of purposes:

1) Increase in the quantity and quality of factual teaching.

2) Reduction in the time covered by the repetitive teaching of basic facts.

3) A more flexible curriculum and time table.

4) A consequent increase in the time available for teaching in a clinical environment, small group discussions, seminars and symposia.

But the report warns that the preparation of tape-slide programmes does demand a considerable amount of time and effort on the part of the teacher.

In the past, many excellent schemes associated with student teaching (e.g. permanent and changing teaching exhibits etc.) which were started with considerable enthusiasm have failed to mature or have never been completed mainly because there was no co-ordinated programme for production and no one person has responsibility for seeing the whole programme through to completion. "Progress chasing" plays an important part in this work and it is clear that departments who have achieved success are those where one member of the staff has been given the specific task of planning the scheme, co-ordinating the work of his departmental colleagues and ensuring that the flow of production is maintained.

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From the marginal remarks, the following deserve to be quoted:

It was stated that standardization of colour videotape will have to be obtained in future so that the materials are interchangeable. Until they are, the time involved in preparing material which cannot be exchanged with other schools does not make this approach practical.

A medical school in South America is looking for financing of a particular project that considers the preparation of teachers in the production of programmed instruction materials, audiovisual aids and instructional kits for differentiated staffing patterns, while from a medical faculty in Africa comes the following statement: "We are very short of staff and we are very interested in audiovisual aids for using in small classes, in seminars/tutorials and by individual students. We have a Medical Illustration Unit where we can prepare most of the simple material needed for teaching. We would like the more established schools to help us with their more advanced material for teaching. Much more important - we are short of funds."

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A final conclusion of this survey will have to wait until more of the replies to the questionnaire are available. However, on the basis of the information already received, it seems fair to state that individual learning programmes will greatly assist national and international efforts aiming at the improvement of medical education and training in all countries. This is particularly true of the developing parts of the world, where the lack of teaching facilities continue to be one of the major handicaps in building up the basic health services on which medical and public health progress rests.

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ANNEX I

COUNTRIES FROM WHICH REPLIES HAVE BEEN RECEIVED

AFGHANISTAN
ANGOLA
AUSTRALIA
AUSTRIA
BRAZIL
CANADA
CHILE
CHINA, Republic of
COLOMBIA
COSTA RICA
DENMARK
FRANCE
FIJI
GERMANY
HOLLAND
INDIA
INDONESIA
IRAQ
ITALY
IVORY COAST
JAPAN
KENYA
KOREA
LEBANON
LIBERIA
MALTA
MEXICO
NEW ZEALAND
NORWAY
PAKISTAN
PERU
PHILIPPINES
PUERTO RICO
SINGAPORE
SWEDEN
TANZANIA
THAILAND
TUNISIA
UNITED KINGDOM
UNITED STATES
VENEZUELA

Total of 41 countries

ANNEX II

STATISTICAL SUMMARY

Schools reporting (total)	120	
from developing countries	45	
from developed countries	75	
Schools using ILPs (total)	67	
in developing countries	14	
in developed countries	53	
Schools not using ILPs (total)	53	
Schools reporting for more than one dept. (5 max)	30	
Total of departments reporting	133	
Total of individual depts using ILPs	29	
Total of individual depts interested in ILPs	17	
Reasons for absence of ILPs:		
Non-availability of individual learning materials	30	
Adequacy of existing learning methods	11	
Lack of interest	6	
Total of schools without ILPs but interested in their introduction	35	
Total of interested departments	90	
Schools <u>with ILPs</u>, in which staff is willing to give time to the preparation of their own future programmes	28	
.... not willing	4	
Schools <u>without ILPs</u>, willing to give time to the preparation of their own future programmes	31	
.... not willing	5	
Material in the 67 schools with ILPs, covering 133 departments, was obtained:		
from another faculty or school	40 yes	78 no
from commercial sources	44 yes	44 no
from both	45 yes	25 no
Material in use in the 67 schools with ILPs, covering 133 departments:		
Audiotapes alone	32 yes	51 no
Text alone	31 yes	39 no
Printed illustrations alone	29 yes	38 no
Projection slides alone	55 yes	33 no
Programmed instruction books	28 yes	31 no

Annex II

Number of schools or departments in which above material was supplemented by other aids:
Audiotapes 64
Text 41
Printed illustrations 18
Projection slides 44
Other media 73

Learning material prepared as extension 97
Tests of efficacy conducted on successive student groups 51
Modifications performed as a result of tests . . 40
Cases of successful evidence of student acceptability 83
Unsuccessful cases 24

Number of ILPs in use reported from 45 of 67 schools, covering 89 departments 1,136

Number of schools with less than 10 programmes each . . 62
" " " " 10 to 20 programmes each 12
" " " " 20 to 40 programmes each 11
" " " " 40 to 120 programmes each . . . 4

Accommodations:
Number of faculties or depts with study carrels or booths <u>at the school</u> . . . . 79 yes 27 no
<u>outside the school</u> . . . . 52 yes 31 no

Number of schools:
where choice of accommodations was made
by students 31
by faculty 47
by both 11

Length of time during which ILPs have been in use:
1/2 to 5 years . . . . in 105 schools or depts
6 to 10 years . . . . in 17 " "
11 to 20 years . . . . in 9 " "
25 years . . . . in 1 school

Number of schools
reporting a system of exchange of ILPs with other faculties or departments 84
reporting lack of such a system 51

Schools and departments without such a system
seeking exchange 84
not seeking exchange 6

Number of schools or departments
contemplating extension of programmes 130
not contemplating extension 11

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