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DEVELOPMENT OF EDUCATIONAL TECHNOLOGY
IN CENTRAL AND EASTERN EUROPE

Studies

Division of Structures, Content, Methods and Techniques
of Education

Section of Methods, Materials and Techniques

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Editor

Dr. Sándor Füle

Development of Educational Technology in Central and Eastern Europe Studies

Division of Structures, Content, Methods
and Techniques of Education
Section of Methods, Materials and Techniques

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Very important
paper. PROVES
that what U.S.A.
(Dept. of Ed + Carnegie) doing
right now (1987) is essential to
participation in One World Socialist
education system.

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"The development of educational technology in the Central and Eastern European countries", as commissioned by the UNESCO Secretariat, is summarised on the basis of the oral and written information supplied by the countries having attended the Budapest International Seminar on Educational Technology in 1976. The countries involved are as follows : People's Republic of Bulgaria, Socialist Republic of Czechoslovakia, Republic of Finland, Republic of Greece, Socialist Federal Republic of Yugoslavia, People's Republic of Poland, People's Republic of Hungary, German Democratic Republic, Union of Soviet Socialist Republics. Data were also supplied by the Socialist Republic of Rumania which could not participate in the Seminar.

The factors exercising a decisive influence on the present standards of the application of educational technology and the strategies and rate of its further spread in the countries listed above are as follows :



- a./ the overwhelming majority of the countries represented /8 out of 10/ are socialist states;
- b./ except for the Soviet Union and Finland the nations concerned can be classified into the category of fairly developed countries from the technological point of view.

On the basis of the above factors some of the specific characteristics of the development of educational technology will be underlined. It follows from the essence of the socialist structure of the state in the countries concerned /except Finland and Greece/ that their educational system is centralized. This creates an extremely favourable situation for central state measures designed to modernize education. The socialist state possesses the means necessary for education, for the widespread use of methodology based on solid technological foundations and of the media and means of educational technology. This fact, however, coincides with increased responsibilities to be born by the organs engaged in decision-making. In a situation in which millions of students learn and hundreds of thousands of educationalists teach, on the basis of unified curricula, decisions involving the development of the methods to be adopted in education and of the media and aids of educational technology call for very thorough preparatory work. From the point of view of the development of educational technology the socialist countries are also in a favourable position because of the fact that television, school television, radio and school radio are operated centrally and are, to a considerable extent, at the service of education.

①

The socialist countries also have a substantial advantage from the aspect of the development of educational technology because the training and in-service training of teachers rest on a uniform basis. ② In addition, curricula are also uniform in the individual countries and for the different types of schools and harmony between the curricular activities and the development of educational technology can be therefore established comparatively easily.

Same in
USA: ETV
& Dept. of Ed
TV programs

① Carnegie
Teacher
Certification

② NAEP Expansion - State Comparisons - National Testing
Teach to Natl. Test = National Curriculum
Centralized Ed

Considering the information obtained from the countries in question and the direct experiences gained in the socialist countries it can be reasonably stated that they all recognized that educational technology interpreted in a modern sense can offer substantial assistance for the effective accomplishment of educational tasks in terms of both quantity and quality; in other words, the use of an appropriate system of educational technology can be of major assistance in achieving educational objectives. This means that in contrast to several western countries the development and application of the media of educational technology follows certain definite objectives that are subordinated to the development strategies of education and methodology.

It is a fact that the introduction and broad spread of educational technology is founded upon two basic conditions : 1./ the appropriate preparation of the educationalists and 2./ research is also very specific to the countries of the region in question. The nations supplying information have achieved considerable results in the creation of the above two conditions. In Hungary, for example, educational technology is an compulsory subject in the curricula of the teacher training institutes and is taught with the cooperation of the National Centre for Educational Technology the establishment of which was sponsored by the Hungarian government, UNESCO and UNDP. Research on the development of educational technology constitutes an integral part of the programme of pedagogical research which enjoys top priority and is considerably subsidized.

* It is also a characteristic of the region that in the majority of the socialist countries, remarkable results have been achieved in the establishment of a system in which the production and distribution of educational audio-visual materials is centrally coordinated.

It is well-known to the readers of this publication that the history of the development of educational technology progresses in the direction of a pedagogically defined complex development of educational technology all over the world after setting out from a technological starting point. This rate of progress is considerably faster in countries in which technological standards are fairly or very high than in the highly advanced nations in which the media of educational technology were first used "en masse" in education some 20 or 30 years ago. The experiences gained there largely facilitate a realistic judgement of the part played by the new media of educational technology.

Even a brief analysis of the information supplied reveals that in the majority of the countries of the region, educational technology looks back on a tradition extending to only one or two decades. This circumstance explains the fact that the memories of the initial excessive expectations connected with the media of educational technology are still fresh in the minds of educationalists concerned causing, at times, two problems : the glamour of technology still gives rise to illusions in some people, while others display a certain measure of opposition to the use of the new system of the media of educational technology.

The participants of the International Seminar on Educational Technology held in Budapest in 1976 /the representatives of the countries supplying the data contained in this document/ discussed the problems outlined above from several aspects along with the alternative strategies of educational technology on the different educational levels and elaborated recommendations to promote further cooperation.

* The recommendations are connected principally with the improvement of the exchange of information and coordination of research in the field of educational technology; they are also concerned with the possibilities of international cooperation in the area of software production.

It is quite obvious that a major step forward can only be taken in the modernization of education after the institutes of educational technology and their network have been established in the individual countries. It would then be practicable to coordinate the activities of the organizational units of educational technology in the region. The actual modernization of education necessitates that the activities of educational technology should be regionally coordinated.

The experts of the region agree that in our day and age the media of educational technology and the relevant materials and methods cannot be absent from any level of education because they can play a very important role in increasing effectiveness. There was also complete agreement on the point that in the teaching and learning process the teacher continues to play an important role even in the presence of the media of educational technology because it is the teacher's personality that provides for the individual colour, character and variety of education and teaching.

The authors of the studies contained in this volume are hopeful that with their work they contribute to creating a realistic picture all over the world about endeavours designed to modernize education in the countries of the region in question. It must naturally be taken into account that this document contains data supplied in 1975 and since then progress is certain to have been made in all the countries concerned in the field of the development and spread of educational technology.

It is hoped, first and foremost, that in the spirit of the Nairobi UNESCO Conference of 1977 this document will make some contribution to the establishment of regional cooperation in the field of educational technology - which is in fact very necessary - above all in Eastern Europe and gradually all over the world.

Dr. Sándor Füle
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General Questions Concerning the Introduction

As is revealed by the replies given to the questionnaires and the debate at the Seminar not every country has a comprehensive plan for the introduction of educational technology. /The term : comprehensive plan means a plan that includes short and long term objectives coordinated with the required funds and extending to the whole of a country, or more precisely to all levels of education./

It is evident from the replies that Rumania, Finland, Hungary and the Soviet Union consider educational technology in the way worded in the introduction of Questionnaire No.1.

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plished.

/" In this context we are speaking of the introduction and development of the modern concept of educational technology, see : General Introduction as the planning and optimizing, in accordance with carefully defined educational objectives, of the educational system, the resources of learning/ audio-visual and printed media/, the value system, the supply of the educational institutions with teaching aids /hardware and software/, and the technological training and refresher courses for teachers and educationalists."/

The Soviet Union, the German Democratic Republic, Czechoslovakia and Greece do not use the definition in the sense outlined above. Bulgaria failed to supply an answer to this point in the Questionnaire. It can be concluded, however, that every country endeavours to develop education, but while some of them approach the problem from a methodological angle or that of planning, others set out from a technological aspect. The strategy of introduction and its specific objectives are presented in the following tables.

Strategy Accepted by the Individual Countries for the Introduction of

Educational Technology

Bulgaria

It is intended to be introduced simultaneously with the implementation of an integrated curricular reform /involving content, methods, etc./.

Czechoslovakia

Provision of schools with media, establishment of a complete system of cabinets, designing AV media in a uniform manner, training of teachers.

Finland

There is no unequivocal strategy as such, decisions on development are taken by several institutions independent of one another.

Greece

The strategy is still to be decided.

Yugoslavia

Provision with hardware and software in harmony with the social system of self-management and with the aid of the joining of forces over a broad range.

Hungary

Broad scheme of training and in-service training in educational technology as part and parcel of the central curricular development.

German Democratic Republic

Complete provision in terms of both hardware and software on the basis of central and systematic analysis of the objectives and content.

Romania

Planning adjusted to be most suitable for the objectives of education/with all didactical elements taken into consideration/.

Soviet Union

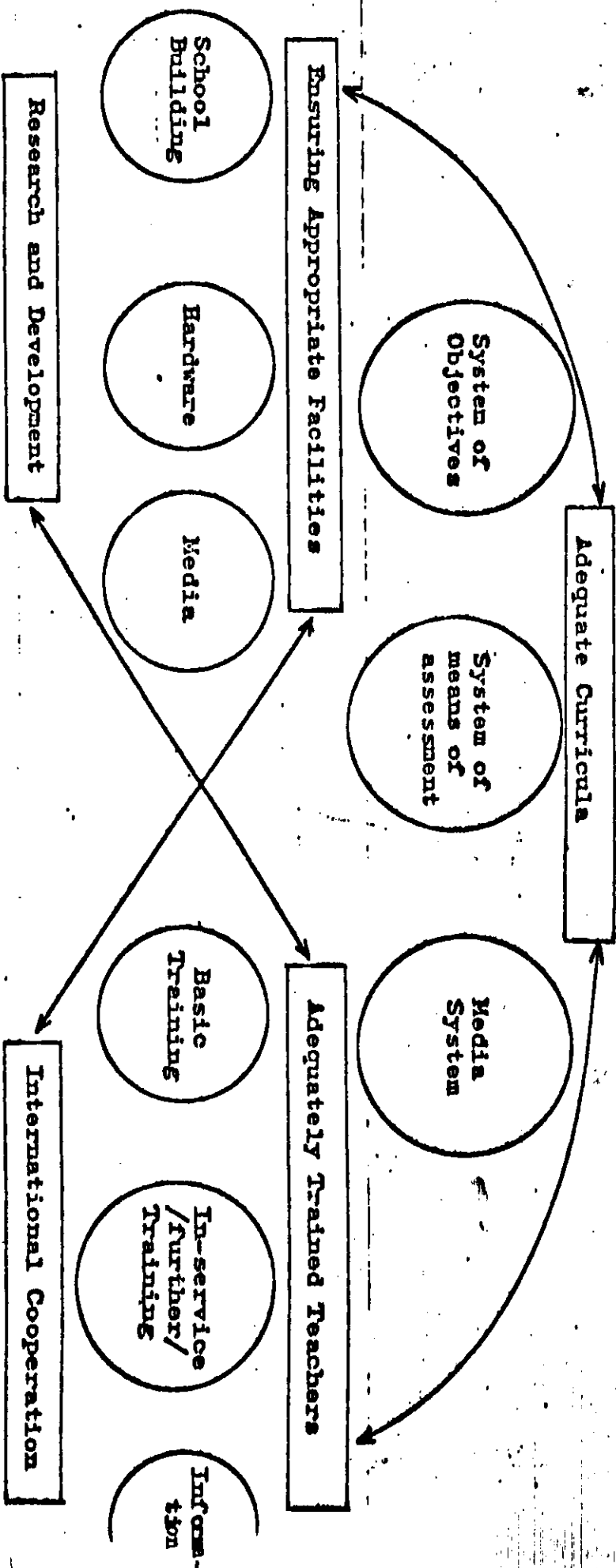
Complete provision with both hardware and software on the basis of central and systematic analysis of objectives and content.

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- II -

FACTORS INFLUENCING THE INTRODUCTION OF EDUCATIONAL TECHNOLOGY



This reflects various aspects of U.S. Educ'l System in 1982 - 1990 the same!

Specific Objectives of the Introduction of Educational
 Technology in the Individual Countries

Abbreviations :

B = Bulgaria,
 F = Finland,
 G = Greece,
 R = Rumania,
 Y = Yugoslavia

Cz = Czechoslovakia,
 GDR = German Democratic Republic
 H = Hungary,
 SU = Soviet Union,

	B	Cz	F	GDR	G	H	R	SU	Y
Acceleration of the pace of learning	+	+	+	+		+		+	+
Equalization /Equal chances for everyone/		+	+	+	+	+		+	+
Mastery Learning Introduction of learning of a different rhythm adjusted to the students' individual abilities	+	+	+		+	+			
Mastery Teaching (Hunter) Changing the methods in the field of relations between teacher and students	+	+		+	+	+	+	+	+
Changing the methods on the basis of relations between theory and practice	+	+		+	+	+	+	+	+
Establishment of the new content of the teaching-learning process			+		+	+	+		

○ - Sov. Union

School
 Family
 Community
 Partnership

New
 Teacher
 Eval.
 Career
 Ladders
 Carnegie

Paulo

Mastery
 Learning

Carnegie

Community
 Ed. School-
 based
 Clinics,
 Lifelong learning

Improvement of relations
 between school and actual life

Settlement of problems caused
 by teacher shortage

Development of the evaluability
 of the teaching-learning process

Integration in the field
 of educational research
 and production

Development of new methods for
 the planner of education

Spreading the methodological
 alternatives for enhancing
 motivation

Establishment of the system
 of independent learning

Supporting the teachers in
 performing their activities

Inclusion of other strata of
 the society in systematic
 learning

B C2 F ODR G H R SU Y

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Let us review the factors influencing the introduction of
 educational technology one by one.

Phyllis: These 2 pages provide ample
 evidence that U.S. & Sov
 Systems almost same. Don't
 forget this paper dated 1977!

1./ Adequate Curricula

In an ideal situation a curriculum completed by an appropriate system of objectives, requirements, tests and media is necessary for the introduction of educational technology.

* The elaboration of the curricula is directed in every participating country by the Ministry of Education. There are no data available about the existence or presence of the system of objectives, requirements, media and tests mentioned above, although Greece, Rumania and Hungary gave an affirmative reply to the question whether the objective of the introduction of educational technology includes the establishment of a new content of the teaching-learning process, while Finland is of the opinion that the development of new planning methods necessarily brings about new content. Czechoslovakia gave a negative answer, Bulgaria supplied no answer at all, although the Bulgarian reply to a subsequent question is that at the moment a new curricular reform is introduced into secondary education, which will be extended to the other levels of education at a later stage. In Finland, public education is also undergoing a curricular reform. Czechoslovakia, Hungary and the German Democratic Republic and the Soviet Union already have at their disposal a comprehensive system of media or list adjusted to the curriculum, that is it constitutes its part and parcel, it has been elaborated centrally and takes the form of either a recommendation or obligatory prescription. Each country considers the production of software important from the point of view of the acceleration of the pace of the introduction of educational technology.

4./ Research on Educational Technology

It can be concluded that partial research of pedagogical nature is carried on in Greece, Bulgaria and Rumania. In Finland research is sponsored by the Finnish National Research and Development Fund and in Czechoslovakia by the Academy of Sciences. Both countries possess comprehensive research plans for 5 or 10 years ahead. The Soviet Union, the German Democratic Republic and Hungary also have comprehensive medium and long term research and development plans.

In Finland research is carried on in the field of integrated problems such as the planning of schools, the furnishing of schools, closed circuit television, and so on, but research is also made into the individual media. In Czechoslovakia programmed instruction, computer aided teaching, school architecture, pedagogical data bank, and so on constitutes items of systematic research.

Curricular research and research on multi-media units is carried on in the Soviet Union and Hungary.

Some conclusions

- Combining curricular reforms and the introduction of educational technology can be very successful.
- Training and in-service training in educational technology act as the substantial basis of the introduction, that is why they are of decisive importance from the point of view of the system as a whole.
- The equipment is a very important but not the only factor in the introduction of the modern concept of educational technology.
- The results of curricular research can offer a realistic basis for planning to the strategy of the introduction of educational technology on every level of education from both technical and methodological aspects.
- The development of media based on research and their spread over a broad range can largely reduce the formation of hampering factors.
- The system of concept of educational technology and the position it occupied in the system of the sciences of education must be clarified accurately, because the fact that it is left to be clarified may well become a hampering factor.
- The moulding of a positive attitude of the experts of education in the individual countries /planners, users, and so on/ and of the society as a whole is a fundamental prerequisite for avoiding hampering factors.
- A method of the development of education which is based on the system theory can be adjusted to the reform of every educational system because the introduction of educational technology is a process composed of a high number of factors.

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II

ALTERNATIVE STRATEGIES OF THE INTRODUCTION OF EDUCATIONAL TECHNOLOGY INTO COMPULSORY EDUCATION

by

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and

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1. The Reasons for and Objectives of Introduction

The economic and social conditions that have undergone considerable changes and the rapid development made by sciences and technology have a direct influence to exercise on the school. Modern methods, means and media that are suitable for transmitting the constantly growing amount of information in a form possible to accept, elaborate and learn are in fact indispensable for the educational and teaching work carried on in the school. Technology has penetrated into the domain of every science including the everyday practice of education.

The introduction of educational media and materials /hardware and software/ and educational technology (*) is one of the vitally important issues of our time in the sphere of compulsory schools educating huge masses of people. Scientific progress supplies evidence to the effect that the most comprehensive objective of the continual, rapid and intensive introduction of scientific and technological developments is the transformation of the living conditions. In most sciences the quantity of scientific information is doubled in a relatively brief spell of time. Sciences get rid of the bulk of outdated knowledge, the fundamental principles and laws undergo major or minor changes and the information material relevant to several sciences comes to be restructured. Scientific information penetrates the concealed processes of nature, the life of the society, production and thinking. Theoretical knowledge makes unprecedented development.

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- (*) The concept of educational technology can be defined, regardless of the term, as the analysis of the components of the process of teaching and learning such as the objectives and requirements, methods, teaching aids, evaluation, etc. and the organization of the process as a whole. In countries where this term is not used, the theory of education, didactics, the psychology of education and the special methodologies of the individual subjects are concerned with the questions of educational technology.

Thus it is more reasonable to adopt the second solution, the method of intensive development. In every country substantial work is being carried on in the field of the structural transformation of the educational system, the schools offering basic education, the improvement of educational programmes and curricula, the optimalization of the teaching process and the intensification of its efficiency.

Examinations made to date supply evidence to the effect that the modernization of the traditional methods and media, for instance, the AV teaching aids, and the application of educational technology on the basis of the system theory **PPBS** make it possible in the basic level schools to bring about qualitative transformation in order to fulfil the demands of scientific and technological progress without the need for a substantial extension of the period of schooling. It has also been proved that the optimalization of the educational programmes and curricula acts as an important reserve area for the modernization of education. In other words, it seems that the contradiction between social and scientific development on the one hand and the school of today on the other can be overcome.

In conclusion it can be stated that the introduction of educational technology on the basic level of education, that is in compulsory education is eventually verified by social and scientific progress. Its overriding objective is to increase the effectiveness of the pedagogical activities; within this the development of the theory of education, in the first place through the consistent application of the pedagogical system theory and through the implementation of the concepts of the pedagogy of the individual subjects that reflect appropriately the special disciplines of today.

2. Strategies of Introduction

It is an extremely complicated task to introduce into the schools of basic level educational technology and the modern teaching aids /both hardware and software/. Its accomplishment requires very high standards of organization and considerable finances. It is desirable to activate to this end a remarkable production capacity and masses of experts, while it must be born in mind that all this leads to substantial savings because the period of education need not be lengthened; at the same time, however, the educational standards of the up and coming generations will rise in accordance with the requirements set by scientific, technological and social progress.

In practice, there can be three methods of the introduction of educational technology. They are as follows :

- it can be introduced centrally on the initiative of government bodies;
- following the individual initiatives taken by communities of teachers;
- or the above two can be combined, with either of them represented to varying proportions.

- the establishment and testing systems of audio-visual aids;
- cooperation with producers and users, with institutions and bodies engaged with the elaboration of relevant methods;
- drawing up the general programme of development.

The activities listed above were supported both in terms of money and content by the Ministry of Culture.

Development and further progress have been assisted from year to year by an increasing number of regional activities. This assistance has taken the form of making available practical experiences by all the institutions in charge of the in-service training of teachers. The relevant experiments, the theoretical and practical activities carried on to this effect are assisted financially by the municipal councils, for example, competitions are held for specialists working with modern audio-visual media and aids.

The experimental broadcasts of the School Radio and School Television which commenced in the 1963-1964 school year marked the beginnings of a new stage in the pedagogical activities. The programmes which had an appeal in the early stages to only the students grew wider by broadcasts on methodology transmitted to teachers. Programmes of this kind presented, among other things, schools in which teaching and learning were aided by audio-visual media.

That was what preceded the establishment in 1976 of the National Centre for Educational Technology /OKK/ by the Hungarian Ministry of Culture, a venture sponsored by UNESCO. The responsibilities and activities of the Centre extend to the following areas :

- Elaboration of a uniform programme of research on, development of and in-service training in educational technology with the cooperation of all the ministries that are interested in education, more specifically in public education, higher education, vocational education and professional in-service training /this is termed the function of coordinating among the different ministries/.
- In this sort of activity the viewpoints of the Ministry of Education predominate, but they are not enforced exclusively. A new institution named Inter-Ministrial Scientific and Coordinating Council for Educational Technology was set up quite recently to attend to the duties of coordination among the individual ministries. The system of accepting the different teaching aids is supervised by the Council which is in charge of a number of other supervisory activities.
- Studying pedagogical, didactical, methodological and psychological problems relating to educational software; carrying on research on and experiments with the listed questions and lines. Elaboration of the principles of the development of educational software and cooperation with other institutions in producing them. Within this scope coordination of the modernization of the curricula and the development of teaching aids are very important tasks.

U.S.A. - Coordination of the plans for the development of the media and groups of media of educational technology /hardware/with the industries concerned. The principal task to accomplish in this field is the elaboration and enforcement of the pedagogical and technological parameters.

- Drawing up in detail the programme of training and in-service training in educational technology and the direction of the organization and content of this training activity.

US/SOV/
Carnegie - Organization of the domestic documentation of educational technology and joining the international stream of the exchange of information.

With regard to the introduction of educational technology in Hungary, the following can be stated :

- a/ television sets, radio receivers, slide projectors, tape recorders and record players are the items of hardware most frequently available in the schools;
- b/ video recorders, feedback devices and teaching machines occur exceptionally in schools providing for basic education;
- c/ in general, the supply of the media of educational technology in secondary and vocational schools is largely superior to that of the schools of basic education /see Appendix No 1./.

The trends of the supply of software are as follows :

- a/ a huge quantity of software has been made available for the teaching of virtually every subject, but they occur rather accidentally in the schools /no central list of the available software is at disposal/;
- b/ the most frequently occurring software items are : slide strips, slides and the programmes of the school radio and the school television;
- c/ transparency for the overhead projectors is surprisingly scarce /see Appendix No 1./.

The latter can naturally be ascribed to the fact that a great number of teachers produce their own transparency and, as a result, they do not figure in the national list of this kind of software.

Following this brief description of the Hungarian "way" of introducing educational technology we shall now present the experiences gained in the Soviet Union. We are able to do so because very detailed answers were sent in the reply to our Questionnaire and in his lecture at the Seminar Professor Sapovalenko drew a very good picture about some questions of the introduction.

In the Soviet Union the "combined" method of the introduction of educational technology is being adopted and a comprehensive programme is being elaborated to promote the method. While drawing up the programme, its components are related to one another; a very strict structural programme is elaborated and it is related to the country's long term scientific, technological and economic development as well as the long term development of the people's cultural standards. Regular analysis and systematized process are necessary which make it possible to determine the optimum variations and the final result of the intermediate periods, and then these optimum variations have to be included in the common programme.

A programme of this sort can only be implemented provided its stages are rationally arranged, the organization is of the highest standards and the work performed by the contributors is coordinated, with the indexes and criteria of the effectiveness of the participants' work determined accurately.

At the beginning, the Communist Party's programme set the guide-line; later, the Federal Ministry of Education proposed the schools, teachers and scientists to elaborate the application of the teaching aids and audio-visual educational media in the pedagogical process. Some research institutes, scientific and other organizations as well as researchers engaged with the production of audio-visual educational materials were included in this activity. The Federal Ministry of Education summarizes, corrects and systematizes the experiences gained with the use of technological aids and audio-visual teaching and educational process, and the research, planning and editing activities performed to this effect. Several scientific conferences have been held to consider the above questions along with the discussion of the experiences obtained /conferences of this kind are the ones on projecting film strips, using the radio and television for educational purposes and introducing the audio-visual educational media/.

While progressing along with this work it became obvious that a research center was necessary to be established. A research institute /NIISOTSO/ for education at school and the teaching aids was subsequently established within the framework of the Soviet Pedagogical Academy. This institute is entrusted with the task of developing teaching aids, determining the demands for audio-visual educational media, educational hardware and teaching materials and of elaborating the methodology of their effective application. 8 experimental schools were set up within the frame of this research institute. Its tasks include the checking, on an experimental basis, of the quality of the teaching aids and the effectiveness of their use. A council composed of the scientists on the staff of the institute makes recommendations to the competent Ministry of the Soviet Union for the production of teaching aids and their application at the schools.

This research institute soon emerged as the Pedagogical Institute of the Soviet Union and the Scientific Centre of the Ministry of Education, and it attended to the tasks of coordinating the introduction of teaching aids, audio-visual educational media and in general educational technology into the schools of basic education.

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On the basis of the summarized experiences gained in connection with the use of teaching aids, audio-visual educational media and educational technology several party Congresses and the Soviet Government set guide-lines and directives for the organs of public education, promoting the introduction of educational technology into the schools. The competent authorities issued a series of decrees and instructions calling for studies and subsequent elaboration of supplying the schools with media of educational technology either in the form of the establishment of a cabinet system or providing for the installation and operation of educational technology media by enlarging the buildings of the old schools to have sufficient space for them. In addition, the demand was also put forward for carrying on studies of the specificities of the application of the media of educational technology in the new schools that were either at the stage of the drawing board or were just under construction. Measures were also taken for the in-service training of teachers and appeals were sent to the enterprises and organizations patronizing the schools to offer assistance in their endeavour to acquire the necessary media and equipment.

Side by side with the insuring of decrees actual financial assistance was also granted in the form of special funds made available for the purpose.

3. Research on and Development of Educational Technology

Checking the quality of the software transmitting and bearing information, the continual examination of their efficiency on an experimental basis and seeking new processes constitute the essential conditions of the introduction and propagation of educational technology. It is expedient to extend research activities to the methodological questions of the application of teaching aids. In both research and development the pedagogical aspects must be enforced above everything else, but owing to the fact that research on educational technology is, as a rule, of a complex nature, attention must also be paid to psychological, ergonomic and aesthetic aspects.

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The general and methodological questions of educational technology and the nature of demands that can be raised in connection with the teaching aids/ /hardware and software/ are, as a rule, dealt with by the pedagogical research institutes. Fairly frequently the organs of mass communication also join in. The work of the development of teaching aids and the media of educational technology is often performed by factories producing teaching aids and commercial organizations on the basis of directives issued centrally. Both research and development are tasks to be accomplished, above all, by researchers. However, teachers and the schools often participate in development activities. Those engaged with experimenting enter competitions, submit innovations and studies which are often displayed at an exhibition. They are commissioned to design materials /software/ write studies giving their opinion on software that has been made available already and publish their own experiences carried by special periodicals. Participation of experimenting people and specialists is highly successful in particular in the examinations of effectiveness.

Regular statistical assessment of the use of the media is part and parcel of the research and development work. Knowledge of statistical data and their analysis enable the planning of the minimum of the media of educational technology and the norms /list of teaching aids/ of the relevant equipment in the schools. This sort of activity is directed and organized, as a rule, centrally. Production development is then planned on the basis of demands.

The subjects of research are of a wide range. Examinations calling attention to the correlations between the objective of teaching and the character of the medium used are fairly frequent.

The application of the means of educational technology makes it possible to elaborate hypotheses in education which can subsequently be verified scientifically and it is also made possible to shed light on the conclusions that follow from them which may, in turn lead to either the verification or the dismissal of a hypothesis.

The use of the media of educational technology and audio-visual aids promotes the development of the students' ability to take notice of things, enables them to acquire knowledge on their own and, as a result, they will learn how to find their way independently along the paths of scientific information. Demonstrated knowledge will be made increasingly concrete, it will be used more intensively in both theory and practice; this will naturally lead to the broadening of the students' scientific, political and cultural world outlook, and the range of their horizon will widen. The machines and devices applied in education such as the closed circuit television, the video recorder and other technological media and aids can largely contribute to raising the standards of the direction of pedagogical processes and their immediate correction if need be. The positive part played by slide strips, slides, magnetic tapes and recordings of other kinds, transparencies, records is actually invaluable in the language laboratories, with programmed materials and teaching devices and machines. As a result of research carried on to this effect evidence is on hand to the effect that the media of educational technology and audio-visual aids contribute to raising the cultural level of the teaching and education of students, to bringing about a rise in the quality and efficiency of education. They also have a stimulating influence on the traditional methods of education and the development of traditional means and media. New educational technology brings about novel ideas and gives rise to new thoughts and approaches in the teachers.

Researches of this kind indicate, among other things, that the pedagogical importance of the media of educational technology and audio-visual aids has not as yet been clarified in every case. Only those technological media are of importance in actual teaching and educational activities which correspond to the appropriate scientific, pedagogical, ergonomic, technological and economic requirements. In effect it would be unfounded to argue that each of the media and aids have the appropriate and desirable properties.

manufacture devices and media that are safe and comparatively easy to operate.

In Hungary, research designed to serve the long term development of the system of public education is one of the main lines of outstanding importance in the national development programme /it is often referred to as the sixth main line/. Research on educational technology is part of this main line. Perhaps the most important is the research programme the objective of which is to elaborate the system of educational software /within the scope of this the planning of educational packages/ adjusted to the new curricula of public education. Modernization of training and in-service training in educational technology, analysis of the teacher's activities /micro-teaching/ and comprehensive research on the system of facilities available in the school /including the school building/ constitute the integral part of research on educational technology. Research in the above listed fields is carried on by the researchers of the National Centre for Educational Technology

Expanded
NAEP will
cover all
these
areas

4. International Cooperation

There are innumerable areas of international cooperation in reserve. UNESCO's participation and guidance in international cooperation are reasonable above all in drawing up subjects free from ideological implications. They are : the organization of exchanges of information, shows and exhibition, training of researchers and specialists of educational technology, elaborating recommendations for the typification of media and aids, circulation of economy calculations, the further improvement of the special questions of evaluation /testing in practice, efficiency examinations, and so on/, elaboration of the problem of school buildings, etc.

Three important tasks must be pointed out here. They are as follows :

- a/ Coordination of the concepts of long term development followed by a uniform arsenal of hardware and aids and specialization of production.
- b/ Organization over a very wide range of the development of software, its specialization and the establishment of an international software bank.
- c/ Studying the questions of the educational technology and the methodology of teaching.

Within the frame of international cooperation endeavours must be made for bilateral and multilateral interstate relations while further developing the existing ties /for example, the scientific conferences of the socialist countries on teaching aids such as the one in Brno in 1975 and in Budapest 1977 and the conference on programmed learning sponsored by UNESCO and held in Tbilisi in 1976/.

There are inherent difficulties of international cooperation such as the language barrier and the fact that a considerable proportion of the software bears marks of content characteristic of the school system of the country by which it has been produced. (U.S./SOV ed agreement

is taking care of this problem!)

The execution of the accurately defined production processes which calls for very thorough professional skills leads to ever increasing requirements to be satisfied by the working people. The structure of employment becomes more changeable along with the vocational and re-qualification structure of the labour force.

At the same time the society as a whole becomes more active in the development of democratism and questions associated with human relations /such as the development of general culture, the problem of adult education, what to do in one's leisure time and so on/ come very much into the picture side by side with finding a solution to the problems of civilization.

Evidently, under the new conditions the introduction of those alternative strategies of educational technology which are more effective than the others, enable acquisition of skills at a faster pace and of a higher standard from qualitative aspects in the field of vocational basic training and the in-service training of workers.

Along with several authors Bertrand Schwartz pointed to this question at the Seminar. This is what he wrote in his contribution to the debate circulated beforehand :

"In a certain number of countries, the development of AV aids was started in vocational training. Why ? For simple reasons : firstly, media was more necessary there than elsewhere as it is difficult to liberate workers frequently. Secondly, there were not any educational traditions. Moreover, the topics taught seemed to lend themselves easier than others to the use of media".

In the countries of the region under examination /East Central Europe/, above all in the socialist countries the new reform of vocational training /training of skilled workers and technicians/ that follows compulsory general education took place in the 1960's. As a result of the scientific and technological revolution and in the interest of increasing the productivity of the national economy of the individual states and making them more competitive economically the in-service training of workers and the further training of specialists holding a secondary school certificate or a degree of higher education came into the focus of attention in the early 1970's.

It must be noted, however, that the demand for a more effective training and management of manpower was established as early as the turn of the 20th century under the prevailing capitalist conditions. By applying the different psycho-technical methods this particular strategy of educational technology emphasized the point of the selection of manpower on the basis of abilities. In other words it was based on what are termed ergonomic viewpoints, but from the aspect of educational technology the conservative methods and means were left virtually unaffected.

*same words now
in U.S.A.*

The fact that the division of labour becomes increasingly differentiated and complicated and that there is a growing demand for manpower in terms of numbers makes it less and less possible to elaborate the indices of the psycho-physiological implications to the minute details and referred to each of the jobs. It is an additional problem that the reliability of the methods with which suitability is diagnosed has not reached the required standard.

The concept of the strategy of educational technology connected with the training of manpower places increasing emphasis on training far more effective than the traditional one and corresponding to the average person and ignores the examinations focused on "suitability".

Meanwhile, the economy has also undergone changes : there has been a gradual switch-over from extensive development to the model of intensive development.

Examinations of the economy in the socialist countries have proved that under certain conditions the standards of the labour force, its level of training become the vitally important factors of progress.

Some of the examinations concerned with the economy of the effectiveness of education have revealed that damages and losses arising from the inadequate training and skills of manpower may well amount to 10 thousand British pounds per annum in the case of plants of medium size /employing 5 to 6 thousand people/.

For this reason it was the major economic units and enterprises that called for the development of vocational training and in-service training and they were the first to introduce more intensive and more effective educational technology. It is fairly frequent that certain companies and enterprises allocate as much as 2 per cent of their total turnover and 10 per cent of the total of working hours to organized training and in-service training even under capitalist conditions.

At the same time the settlement of issues relating to human aspects have come into the foreground in the socialist countries in the interest of attaining higher culture and the reasonable use of increased leisure hours. This brought about further progress of training designed to promote general culture within the framework of in-service or further training. This is based principally on the use of the media of mass communication, above all the radio and television.

At the moment coordinated development of the socialist countries, planned economy and the international division of labour /integration/ call for the optimization of manpower reserves of appropriate vocational content and standards /vocational training/ and the in-service training of the labour force.

In the following the situation of the in-service training of workers will be described in accordance with the aspects outlined above.

2. The Objective, Principles, Content and Major Organizational Forms of the In-Service Training of Workers

The objective and system of content of in-service training include the brushing up, modernization and further development of the vocational skills of the workers in order to enable them to do their job more effectively; training them to be able to cope with the duties of related professions and trades; training them to acquire a second or further trades and training them for new trades that emerge. This system of in-service training extends to the initial training of workers as well.

In view of the fact that increasing the professional abilities of the workers is a considerable resource of the development of the national economy, it is necessary for the enterprises and plants to give in-service training to their workers periodically /in general in every 5th to 8th year/ while taking into consideration the objectives of economic policy, the specificities of the different industrial branches, and the production and development plans.

In addition, in-service training provides a framework for the training of foremen and team leaders /working team leaders, foremen of brigades and groups/ designed to enable them to acquire and effectively translate into practice in the course of their activities the knowledge necessary for the direction of working teams of a smaller or bigger size and use their knowledge of organization, industrial /workshop/ management, the organization of labour and labour safety.

The content of the courses of in-service training is composed of the following parts :

- a/ brushing up and complementing general and fundamental culture acting as a basis of modern vocational knowledge, with special regard to natural sciences;
- b/ vocational /theoretical and practical/ training;
- c/ increasing fundamental culture serving the deepening of political knowledge.

While establishing the system of in-service training and determining its content measures are taken to make in-service training to act as an integral complement of vocational training carried on in a school system.

USA

To offer in-service training is a fundamental task of a company, that is why the organization of in-service, training, creating the necessary conditions and covering the inherent costs are tasks to be accomplished primarily by the enterprises.

- tut, tut!

The right is guaranteed for every worker to participate in in-service training provided he satisfied the specified requirements. In addition participation in in-service training can be made to be the duty of the workers in case this is required by the interests of the national economy. The method of financial incentives can also be adopted. Part or the whole of in-service training made compulsory for the workers for the sake of instructing them in the theme and practice relating to their jobs can be held during the working hours.

Based on its production and technological development plans and coordinated with their respective periods every enterprise should draw up a plan for in-service training which should contain the list of people to be included in in-service training, the object, most important topics, duration, personnel and material facilities as well as the budget of in-service training.

The organizational forms of in-service training are as follows :

- a/ courses : this is the most widespread form of in-service training and contains either merely theoretical sessions or both theoretical and practical ones;
- b/ Guided individual learning : it can take different forms such as consultations, or perhaps programmed materials, reports, the application of different media and hardware facilitating education or training with the aid of the radio and television;
- c/ special forms, for example, sessions of professional exchanges of views, lecture combined with practical demonstration, further training abroad.

The most expedient form of in-service training ensuring maximum effectiveness must be selected by the company concerned according to the content of training, the composition of the participants /preliminary training, sexes, age brackets, and so on/ and with the well tested educational methods in adult education taken into consideration. The content of in-service training can also be determined by the Minister in charge or a centre of in-service or further training.

It is the duty of the Ministry or centre in charge of in-service training to elaborate the educational documents of in-service training such as syllabuses, textbooks and booklets, guides, methodological aids, AV aids and materials, and so on and to supply them. This activity is financed in the socialist countries from the funds made available by the state budget for this purpose. Of the educational documents determined to be used centrally,

for example, the syllabuses and methodological guidebooks are available for the enterprises at a certain cost. There are low charges for the textbooks and booklets, as well as the guides to be paid by the workers.

The in-service training of workers can be stimulated in different ways; the incentives can take the form of moral distinction, extra pay or other methods can be adopted either individually or combined.

The company must make sure that the workers attending in-service training offering higher qualification stay with the enterprise even after completing their training. To this end a special contract can be signed in which it can be stipulated that the worker participating in any form of in-service training will stay with the company for an agreed period.

3. The Major Types of the Courses for the In-Service Training of Workers

/the structures and duration of training/

The types of the courses of in-service training are determined, as a rule, by the demands to be satisfied by the labour force and the standards of its preliminary training. Accordingly, the following types of courses can be held for workers:

- a/ Courses offering basic training : they are of the most general types because in several enterprises the prerequisite of obtaining a job is the successful completion of a course of this kind. They are generally attended by unskilled workers or those who need to be retrained, because there is no longer any demand for them for reasons of their jobs having been discontinued following changes in technology and therefore they have to be given new sort of employment. Such courses are, as a rule, also held for purposes of introducing a new technology or process. The duration of these courses can vary from some weeks to several months.
- b/ Specialized courses run for skilled workers in case new machines are installed or new production processes are introduced /their period varies between 50 to 150 hours/.
- c/ Courses training their participants for a higher qualification or standard. They provide for the training of foremen, outstanding skilled workers, and so on. The period of training can extend to several hundreds of hours on terms. Instruction is given in subjects independent of one another and a certificate is awarded after the course.
- d/ Courses preparing workers for a second trade, for example, the in-service training of workers in the related trades of machining such as turning, milling, planing chipping, and so on.

e/ Managerial courses.

f/ Refresher courses or those offering a broader range of knowledge /80 to 120 hours per course/. They do not give any qualification but offer new knowledge arising from technological development and the progress of natural sciences simultaneously with the brushing up and standardization of old knowledge.

g/ In-service training designed to raise the general cultural standards. Courses of this type are run mainly for people who have not completed the general /primary/ school, especially the upper 6th to 8th grades/. There are also courses held for the workers to enable them to complete institutes of secondary education /to take the matriculation exam/, thus preparing them to enter higher education.

h/ Training designed to achieve new objectives and to meet new requirements /training of a sociological aspect/

For example, - preparation of people to enable them to participate in further education, to learn independently and take part in "distance" education;

- preparation of people to develop a labour process /technological process such as rationalization, optimal management of the workshop, moulding their economic outlook/.

- courses designed to achieve better working conditions /courses on labour safety, accident prevention, ergonomic problems, and so on/;

- preparation for the democratization of labour /development of factory democracy, preparation of group decision-making, development of the technology of communication/;

- preparation for the internationalization of labour /understanding technological descriptions and instructions for maintenance if they are written in a foreign language, becoming familiar with the conditions prevailing in another country, and so on.



4. The educational bases and system of media and facilities of in-service training

/specialized classrooms, training workshops; the media /hardware/ of educational technology used and provision with software/.

The content of the in-service training of workers can be divided into theoretical training /education in the classroom/ and practice sessions /training in workshop/. In trades where practice is more essential than theory their

Development of the educational technology described above calls for pedagogical and cybernetic approach founded upon the system theory and requires designing, planning and experimenting on an interdisciplinary basis /for instance, on an information theory, algorithmic, operation research, etc. basis/.

In practical training, models and the method of screening slides and film strips is used :In 15 to 20 per cent of the cases/ along with closed circuit television /1 or 2 per cent/, the demonstration of machines and tools and practising the different operations on them /75 to 90 per cent/.

5. Methodological Training of Educationalists in Charge of In-Service Training

At the courses run within the framework of the in-service training of workers, in the overwhelming majority of cases the teaching staff /80 to 90 per cent/ are recruited from the specialists of the factory or enterprise concerned /engineers, technicians, mechanics, and so on/. Methodological courses are run for them periodically and according to the courses at which they teach in the centres of in-service vocational training.

In general the curricula of the courses of in-service training contain methodological guidance for the teachers /for instance, information is supplied as to the means and aids of demonstration at disposal, the ways in which learning should be guided, and so on/.

In the in-service training centres of the different industrial branches special methodological materials or those of educational technology are issued which are intended at present mostly for teachers and special instructors responsible for vocational basic training.

/At the moment they are also intended for the teachers and instructors engaged with in-service training, but they are supplemented with the methodological specificities of the training of adults./

The other major group of teachers engaged with in-service training is recruited /10 to 20 per cent/ from those active in vocational basic training.

Full time teachers and instructors of in-service training /for theoretical and practical training/ are employed in most of the cases by the centres of major enterprises or industrial companies.

It is increasingly frequent that the staff are given training in educational technology in addition to instruction in methodology. There are considerable differences in this respect even within one country.

6/ The System of the In-Service Training of Workers
and the Centres of its Organization and Direction

In the socialist countries, the development of the system of the in-service training of workers is specified, as a rule, by a government decree. In the following the system that was developed in Hungary will be presented as a possible example.

On the basis of a resolution passed by a higher body in 1971 the Minister of Labour issued a decree in 1973 specifying in detail the content, forms and organization of the in-service training of workers and the methods and ways of incentives.

In-service training that was laid on brand new foundations began in 1973 and its organizational framework had to be established at the individual ministries by 1975, the closing year of Hungary's 4th Five Year Plan.

The ministers in charge of the different industries issued their own specific decree concerning the in-service training of workers and subsequently established the educational and methodological centres and institutes providing for in-service training.

(This is under way in USA with school/business partnerships etc)

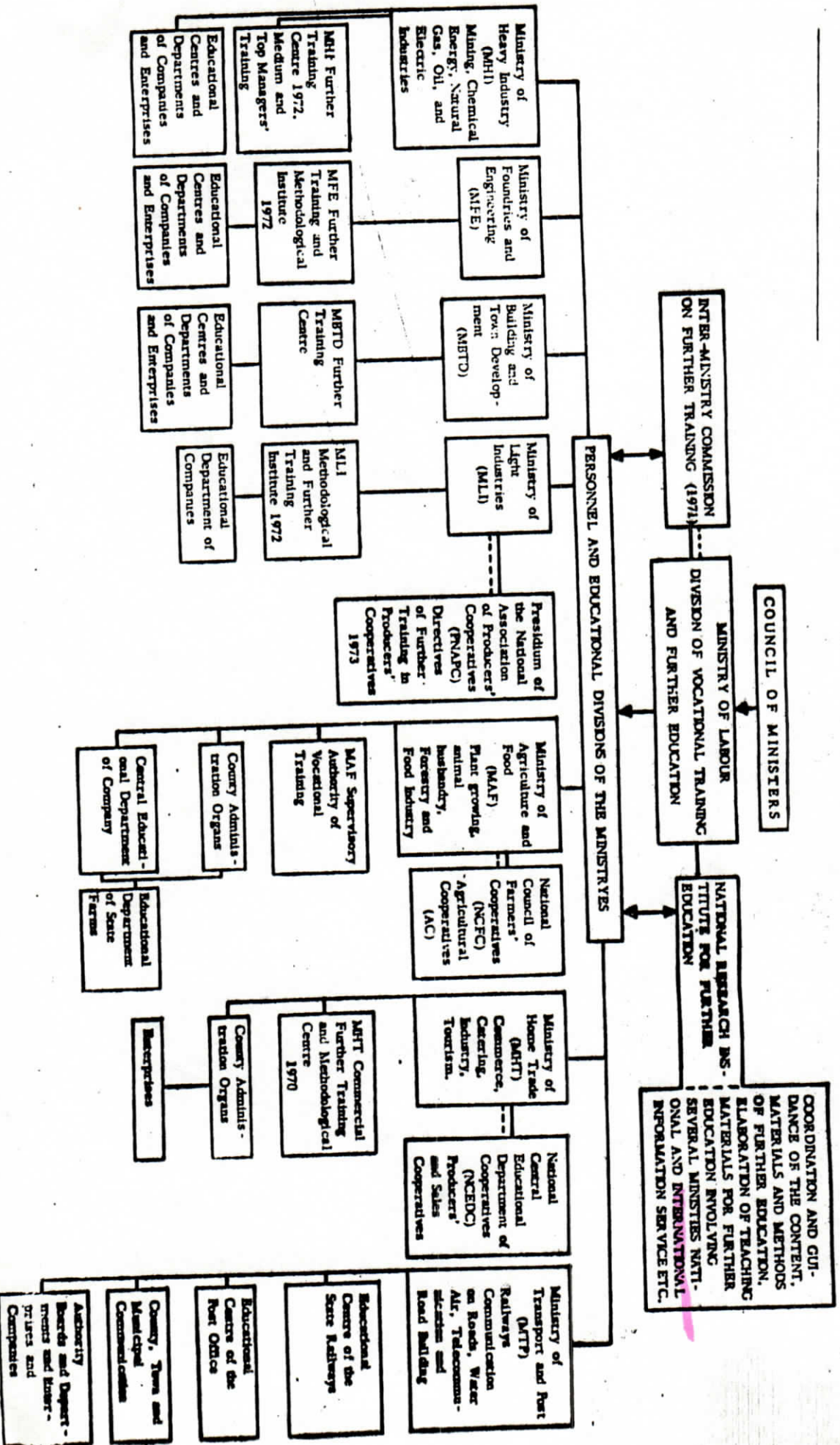
A committee /Committee on In-Service Training/ was set up to coordinate the tasks connected with in-service training. The Research Institute for the In-Service Training of Workers and Medium Level Specialists offers assistance in the accomplishment of the tasks of in-service training involving trades belonging to more than one ministry by making available teaching materials and guidebooks on methodology.

Most of the ministries possess a centre or central institute the basic tasks of which include activities such as organizing and coordinating the in-service training of workers and their leaders, supplying this activity with the necessary documents /software/, conducting relevant research, offering special advisory service and assistance to the local /company/ training organs. The system of the further training centres referred to above is contained in Figure 1., while their addresses are given in Appendix No.1.

In each of the centres there is a section of educational technology in charge of the educational technology aspects of training. In order to increase the effectiveness of training a special regional further training centre has been set up for experimental purposes. It does not attend to duties relating to a specific industry, but it offers assistance to several plants mainly small ones belonging to one industry in accomplishing their tasks of in-service training.

In our opinion the elaboration of a uniform concept of educational technology which can universally be applied to the whole system of the in-service training of workers in one country /or a group of countries/ is only possible in case the prevailing situation and the detectable trends are appropriately taken into consideration.

Figure 1



trained at the teacher training colleges for four years, while teachers for the secondary schools are trained either at colleges or universities, in particular at the faculties of art and liberal arts, natural sciences of the art and science universities, at the technological, economic and agricultural universities.

1.2 The Organizational Conditions of Pedagogical Training

Instruction in the teacher training schools in psychology and pedagogy is composed of lectures which are followed by relevant discussion group and practice sessions. The students listen to lectures on logic, general, development and educational psychology and special methodology for the different subjects.

Partly parallel with the lectures and in part after them the students have to participate in practice sessions in the schools and kindergartens, respectively, at which their task is to complete the theoretical knowledge they have acquired with observations made in practice and their application in practice.

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Career
adders,
merit pay,
master teachers.

In general, the number of lessons allowed for teaching in every type of institute make it quite possible to apply theoretical knowledge in practice. The curricula /programmes/ of the teacher training schools set the practical application of theory as an objective. Four countries possess what is thought to be appropriate description of practical pedagogical abilities and skills; in two countries the existing system of objectives is not regarded to be adequately operational, while in another country of the region examined such list of the skills is not available. Considering the fact that those responding to the questionnaire failed to attach a description of skills, it was impossible to state on the basis of the replies sent in whether or not the existing descriptions of skills can actually serve as "measurable objectives of practical training".

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The replies sent in concerning the principles and organizational viewpoints of teacher training reveal that most informants have elaborated the first stages of a competency based teacher training programme.

Although not all the countries replying to the questionnaire supplied detailed information on the types of institutions in charge of teacher training it appears on the basis of information made available that the programmes of teacher training are conventional and have shifted, to a certain extent, in the direction of training based on performance.

1.3 Selection of Future Teachers

Knowledge acquired in the secondary school in the subjects concerned serves as the primary basis of selection made at the entrance examinations to higher education. Aptitude tests are adopted to prevent candidates unfit for health or physical reasons for the job being admitted to kindergarten nurse and primary school teacher training schools.

In giving instruction in the individual subjects such as biology, chemistry, the mother tongue, foreign languages, history, and so on the media of educational technology have a highly important role to play. Software made for public educational purposes is taken advantage of in training and the staff of the schools of teacher training also design and produce slide series, transparencies for the overhead projector and programmes for the teaching machines on their own in fairly large numbers.

* We are not going to enter into details of the media of educational technology used in the teaching of the individual subjects, but this does not necessarily mean that we ignore the double importance of educational technology applied in the field, for it is quite obvious that in addition to promoting more effective instruction in a certain subject, up-to-date methods of teaching would the students outlook and orientate their methodological knowledge and culture.

2.1 The demand for the Use of the Media of Educational Technology in Teacher Training

The major defects of teacher training bringing about an internal demand for the use of modern educational technology were as follows :

1. It was difficult to ensure basis laid on appropriate empirical and practical foundations for the lectures on theory. References to the students' experiences gained previously and to the benefits involved in group visits to classes taught by another teacher and the talk given by the instructor or teacher failed to provide for an appropriately concrete, adequate and uniform basis founded upon experiences. Theoretical training was not adequately demonstrative either.
2. The different subjects /psychology, pedagogy, the didactics of the individual subjects/ of theoretical training were not always in complete harmony with one another. They frequently overlapped one another and practical orientation was virtually missing.
3. Complete accord between theoretical and practical training could not be established. There were always differences of time and sometimes of approach and outlook between lectures on theory and experiences gained in practice.
4. Difficulties were often encountered in the event of the practical organization of group visits to other teachers' lessons that offer practical experiences /this means that it was not always possible to find a lesson of adequate standards to be visited at the time set for such a visit by the curriculum of the given training institute. It was also frequently impossible to send the students to visit training schools because they were too big in number and for this reason they disturbed the smooth run of teaching work. Considering the

* fact that a live lesson is highly varied and quite incalculable it was impossible to call the students' attention to events that were important to them.

5. Teaching performed by students /practice teaching/ posed too complicated a task to the student teachers to face.

2.2 AV Materials Used Most Frequently in Teacher Training

We set off from the assumption that the use of the media and means of educational technology in teacher training contributes to shaping the student teachers' outlook and attitude towards educational technology. It came to light that the media of educational technology encountered by the teachers in the course of their educational activities are used over a fairly broad range in the training of future teachers.

The audio-visual aids were the first to contribute to making theoretical training more demonstrative.

Films and film strips have now been used for a considerable period for giving instruction in the different pedagogical subjects. In the early stages the parts of feature and popular science films that were of interest from a pedagogical point of view were screened and subsequently analysed by the student teachers. Later on several special educational films were made to assist in teaching psychology, didactics, the theory of education and the history of education. The new method of teaching mathematics is illustrated by a series of film strips.

The series "Educational Situations" presenting situations briefly for purposes of facilitating aptitude tests at the entrance examination and made by OOK.

/National Centre for Education Technology/ constitute a separate group of pedagogical films. The applicants must find a solution to a situation or problem or problematic situation presented in 1 to 3 minutes. From the replies they supply conclusions can be drawn as to their ability to solve pedagogical problems, their imagination and the extent to which they are devoted to the children. The extent to which the applicants prove suitable in practice and their ability to solve the different situations were found to be closely correlated. /Mrs. Ungár, 1974/.

Slide series is used extensively in all the responding countries, while the use of slide series accompanied by sound, sound recordings, transparencies for the overhead projector and sound films is less frequent. Video-recordings are not used in two countries while in the others only some institutes rely on them in training.

The use of programmed materials and teaching machines is far from being widespread, while television transmissions and radio broadcasts are used on a broader scale especially in Bulgaria, Czechoslovakia, Finland and Rumania.

(U.S.A. will provide.)
& don't already have.

1977

The methods of demonstration outlined above did not bring about a change in attitudes and outlook nor did they lead to a breakthrough in teacher training. Films that are most complete in terms of the values of reality could not spread over a wide range first of all because of the high costs of production involved.

2.3 Television in Teacher Training

Because of their inherent technical qualities closed circuit television and video recording offer the most varied possibilities for giving instruction in pedagogy. Television has created more favourable conditions than any of the media for illustrating theoretical training, made it possible to narrow the gap between theory and practice, eased the tension referred to earlier in connection with group visits to a class to study classroom activities, enabled a more effective direction of practice teaching carried on by the student teachers as well as the recording and subsequent evaluation of the activities performed by the students subject to training. As a result there is need for the more accurate planning of the whole system of teacher training and the transformation of educational technology as a whole.

2.3.1 The Part Played by Television in the Modernization of Group visits to Classes

Television was first used for purposes of modernizing group visits to classes or substituting such visits. So-called studio classrooms were established from which a teaching lesson could be televised for a very large audience outside the particular classroom involved in the process. The principal advantages involved in closed circuit television were ascribable to the fact that a very large audience can watch the teaching-learning process during the lesson, a running commentary can be given on the lesson while it is in progress, several pictures can be televised from the different positions the cameras are situated and the cameras constitute a less disturbing factor than the presence at the lesson of student teachers in large numbers. Subsequent research revealed that live television transmissions by the closed circuit TV system are not more effective than the traditional group visits by student teachers to classes provided the advantages lying in the possibility of recording the transmissions are not utilized. The only advantage of live transmission along the above described lines but without video recording over the traditional group visits is that the latter is more economic.

/Encskó, P., Falus, I., Petri, A., 1972/

Closed circuit television transmission is a method adopted even today in the institutes of teacher training. In some places this is the only method of being "present" at a lesson for reasons of the very high number of student teachers.

Closed circuit television systems reveal highly varied technical solutions. There are no reliable data on hand for a comparison of the pedagogical effectiveness of the different technical solutions.

Over the past few years the closed circuit television systems in the countries of the region have been complemented with video-recorders. In Hungary, the Ministry of Education and the National Centre for Educational Technology have elaborated a joint plan under which the video recorders constitute the organic parts of the newly established television centres at the colleges of education. The teacher training schools are being equipped with the same facility right now. The television centre of the Szombathely College of Education possesses outstanding technological facilities even by European standards.

2.2.2 The Use of Television for Illustrating Lectures on Theory

Closed circuit television systems fail to make it possible to illustrate lectures on theory systematically and appropriately, that is to say the incorporation of demonstration into the process of the lecture is out of the question. As a result of the use of the video-recorders, however, this difficulty has been overcome and the types of video-recordings that can be used most expediently have been developed. They are as follows :

- a/ recording of a complete lesson;
- b/ experimental processes, recording serving the purposes of presenting new and complicated methods /they illustrate the essence of the novel process, perhaps the 20 to 40 minutes to be presented are selected from a material recorded over several months;
- c/ archives of the different themes constitute a collection of recordings of different lessons to illustrate the individual psychological or pedagogical concepts or processes;
- d/ problematic and critical situation are films of a duration of two to three minutes which can be used quite effectively to illustrate a problem and to check the application in practice of the student teachers' pedagogical knowledge in addition to testing the applicants pedagogical aptitudes; besides they can also be used to the best advantage for launching a debate;
- e/ the so-called model-recordings serve the purposes of illustrating the individual teaching abilities isolated from one another
/Palus, I., 1977/.

2.2.3 The Use of Television for the Modernization of Practical Training

The video recorder offers immense possibilities for raising the effectiveness of practical training. It is capable of giving a more accurate and more complete picture than any previous media to the student teacher about his or her own teacher activities.

The method of micro-teaching ensures the modernization in a complex manner of practical activities and the acquisition of the different teaching skills. When this method is adopted the student teacher is first made acquainted with written material and this stage is followed by making him familiar with the teaching skills to be acquired with the aid of model recordings. Then he has

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to design a comparatively brief class to practice them; this is followed by the holding of the lesson he designed, it is recorded on video tape which is subsequently analysed and he has to design new drills to eliminate the errors revealed by the recording.

/Detailed description of the method is given by Ivan Falus in a paper published in 1975./

Closed circuit television and video recorders are comparatively widespread in the countries participating in the Seminar. The fact that while in certain countries closed circuit television systems were introduced over a very wide range and video recorders are used on a comparatively smaller scale, in other states the situation is the reverse reveals interesting differences lying in the approach. Of the video recorders used the most common make are Sony and Philips but there are also Lomo, Elektronika and Ampex video recorders in use, too.

The method of microteaching is adopted in six countries with more or less frequency and with an experimental character in the majority of cases.

The method of microteaching is adopted in Hungary with experimental character and under the guidance of the National Centre for Educational Technology at the Eger College of Education, at the Szombathely College of Education, at the Esztergom Teachers' Training School and at Lorand Eötvös University, Budapest.

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Educational packages of microteaching are being developed in the above listed educational institutions. At the Eger College of Education, educational packages designed to promote the ability to formulate elementary questions are being developed; at the Szombathely College of Education packages designed to develop the ability to ask questions provoking the person responding to think are elaborated, at Lorand Eötvös University packages designed to promote the ability to direct individualized labour are developed while at the National Centre for Educational Technology experiments are made with teaching packages designed to develop the verbal abilities accompanying the demonstration made by the teacher. At the Esztergom Teachers' Training School the possibilities of fitting the technology of microteaching into the system of primary school teacher training.

In making model recordings and in the elaboration of slips of evaluation there is room for cooperation. Only Finland and Czechoslovakia possess archives of video recordings illustrating educational and teaching methods. They also have archives of sound recordings which also exist in Hungary and Rumania. The opinion given by the head teacher in charge of the student teachers activities is the most frequent feedback for their educational activities. An objective system of observation is used only incidentally as a source of feedback.

Half of the responding countries said that they use magnetic tapes and video tapes for purposes of feedback at least on certain levels of education. It is interesting to note here that the views of the head teacher in charge of

the student teachers' activities, a point which American researchers found to be comparatively ineffective, is the most frequently adopted method of feedback in the countries of the region under review. It would be quite instructive to find out the methods that were found to be effective by the responding countries.

2.4 Supplying the Schools of Teacher Training and Colleges of Education with Software

The frequency of teachers, institutions and university faculties producing software for teacher training is roughly the same. Since teachers are very rarely trained, find time or have the technological facilities available for producing teaching materials /software/ by using the media of educational technology interpreted in the strict sense of the term, it would be interesting to find out more about the extent to which the teachers in the responding countries can contribute to the development and evaluation of educational materials /software/ and, in particular, what kind of materials they can produce.

The replies given to Questionnaire No. 4 show that in the overwhelming majority of countries there is not as yet an appropriate standard of organization for making maximum use of the teaching materials already at disposal. Since the development of effective educational materials is quite costly, the expenses incurred by development can only be justified by use over a very wide range.

There are sources of materials available in the majority of institutions in four of the responding countries, while in another two such materials are at the student teachers' disposal only in some of the institutes.

There is, as a rule, one technician as per 50 to 400 students in the countries responding to the Questionnaire. Most of them possess medium or high level professional qualifications.

The different materials of educational technology /software/ serving the purposes of teacher training are produced by the individual teachers, working teams operating within one department, institutes and central organs. The opportunities lying in the exchange of materials among the different institutes is not as yet taken maximum advantage of in the majority of the responding countries.

In Hungary, software is also made centrally. Slide series, transparencies for the overhead projectors and programmes for the teaching machines are being produced and distributed by the Educational Technology Centre of the Nyiregyháza College of Education. Video-recording are made by the Educational Technology Centre of the Szombathely College of Education while educational films are made by the National Centre for Educational Technology.

In-service Training of Teachers and Educational Technology

There is institutional in-service training for teachers in every responding country. This sort of training is obligatory in the majority of cases. In Bulgaria and Rumania successful completion of the different courses is followed by pay increase virtually automatically. Promotion or a reduction on the number of obligatory teaching lessons, depending on performance, occur in the other countries.

* In the course of in-service training the teachers' professional knowledge in their specific subjects, their pedagogical, psychological and ideological knowledge are developed and they are assisted in improving their practical pedagogical activities and in being made familiar with the novel educational materials.

In-service training in special educational technology is performed by the National Centre for Educational Technology in cooperation with the in-service training institutes of teachers of the different countries of Hungary. The curricula of the courses of different levels can be compiled from the modules elaborated by the National Centre for Educational Technology and they can easily be adjusted to local requirements.

The use of film strips and films, slide series, radio broadcasts and television transmissions are very widespread in the teachers' in-service training, but video recorders are much less frequently applied.

5. RESEARCH AND COOPERATION

Research connected with the questions of educational technology in teacher training is carried on by the institutes listed below :

Bulgaria :

I. Institut usoversenstvovaniya uchitely
Nauchno-issledovatel'skiy institut obrazovaniya im.
T. Samodumova.

Czechoslovakia :

Institut pedagogiki Komenskovo
and certain university faculties and pedagogical research institutes

Finland :

Institute for Educational Research at the University of Jyväskylä

Hungary :

Országos Oktatástechnikai Központ /National Centre for Educational Technology/

Soviet Union :

N I I skolnovo oborudovaniya i TSO APN SSSR
Voronezhskiy pedagogicheskiy institut Leningradskiy pedagogicheskiy Institut
Kievskiy pedagogicheskiy institut.

When elaborating the questionnaire the overriding principle was to include questions the replies to which enable us to assess the prevailing situation and disclose the theoretical and practical possibilities of the spread of educational technology.

Our examinations were focused on analysing the following groups of questions :

- I. The concept of educational technology.
- II. The possibilities of the introduction of educational technology into higher education and the experiences gained with its application.
- III. Research on educational technology in higher education.
- IV. The organizational structure of educational technology in higher education.
- V. Training and in-service training in educational technology.
- VI. International cooperation in educational technology.

I. Concept of Educational Technology

"effective"
The ever accelerating pace of development of sciences and technology brings about tasks of increasing dimensions to be accomplished by every level of education including higher education. Today the intensification of the effectiveness of education and raising its standards assume the character of social demands.

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The higher educational systems of the individual countries can only satisfy increasing requirements in case they embark, parallel with the modernization of the content of education in the function of the expectations of the society, on bringing the applicable methods, means, media and systems more up-to-date. One of the essential preconditions of the success of work carried on to this effect is to accept and show a positive attitude towards educational technology on the theoretical basis of which the practical implementation or modernization can be performed.

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The organizational forms, content, methods and relevant technique of the educational process constitute a system on every level of education including higher education. It follows from this that the introduction of educational technology has an influence to exert on the modernization of the organizational forms and content of the teaching-learning process.

There are slight differences to be encountered in connection with the opinions on, approaches towards and the characteristics of educational technology, though these differences /detectible in Bulgaria and Czechoslovakia/ have nothing to do with the core of the problem.

The position that the present use of the different audio-visual aids or groups of aids is no more than the enforcement of one of the elements of educational technology in the teaching process is quite characteristic.

* Educational technology cannot be confined merely to the application of the different audio-visual aids, because the essence of educational technology lies in the systematic planning, direction and evaluation of the teaching-learning process which are aimed at achieving accurately defined objectives based on research into human learning and communication. To this end the combination of human and non-human resources must be fully utilized.

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II. The Possibilities of the Introduction of Educational Technology into Higher Education and the Experiences Gained with its Application

1. Those responding to the Questionnaire offered different rational solutions to the introduction of educational technology into higher education. It is a general opinion /in Bulgaria, Czechoslovakia, Finland and Hungary/ that it is most expedient to embark on introducing educational technology if this venture is part and parcel of the reforms of higher education to be implemented on the basis of relevant government decisions and resolutions.

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mandates

In the course of this activity, however, the practical work that has been performed to date by the higher educational institute in question in the field of educational technology must be taken into account.

2. It is necessary to launch programmes of research and experiments coordinated and elaborated on the basis of a central development plan as the strategy of introduction /Bulgaria, Greece and Rumania/. In this activity a decisive role is played by the higher educational institute concerned /Bulgaria, Finland, Hungary and Rumania/ and the individual initiatives taken by the staff of the institute /an opinion voiced by Bulgaria, Finland and Hungary/.

It is most expedient to guide the introduction, in terms of the relevant concepts, by establishing a centre to be in charge of the work of coordination on a nationwide scale.

3. One of the preconditions of the success of the introduction of educational technology is to ensure that the teaching staff of the higher educational institute in question displays a positive attitude towards the method to be introduced. Regrettably, however, a considerable part of the educationalists in higher education /Greece and Finland/ is reluctant to make any

Teachers resistant! They have same problem, we have.

kind of "methodological" approach to the content of the special subject in question. This situation can be changed by launching different pedagogical courses /Courses on educational technology/ as is the case in Bulgaria, Czechoslovakia, Hungary and Rumania. In addition, a significant role must be attributed to be played by the different scientific and methodological conferences /a view submitted by Bulgaria, Czechoslovakia, Finland, Greece, Hungary and Rumania/ While in-service training on an individual basis also plays a remarkable part /as suggested by Bulgaria, Czechoslovakia, Finland, Greece, Hungary and Rumania/.

4. University students, as a rule, are ready to give unconditional support to the introduction in practice of educational technology /as stated by Bulgaria Czechoslovakia, Finland, Greece, Hungary and Rumania/; nevertheless, this alone is not sufficient for the introduction to be successful. There is more than the acceptance of the method in a passive manner. Contrary to previous practices the students must be required to show a more active attitude than before. The new situation of learning can, by no means, be successful without active cooperation between teacher and student. We must be prepared to face this problem.
5. It can be concluded on the basis of the analysis of the replies contained by the Questionnaire that the different responding countries have a better supply of media /hardware/ at their disposal, even if not completely sufficient, than software.

The table given below illustrates the prevailing situation.

	Supply of media		
	insufficient	average	good
a. Projecting stationary pictures accompanied by sound		H	E, Cz
b. Projecting movie pictures /filmstrips/	B	Cz	H
c. Television	E		Cz, E
d. Sound systems	Cz, E	B	
e. Teaching machines	B, Cz, E		
f. Multi-media systems	F, E	Cz	
g. Language laboratories		Cz	B, E
h. Computers in education	B	Cz, E	
i. Others			

Note : B for Bulgaria
G for Greece

F for Finland
Cz for Czechoslovakia

H for Hungary

6. In spite of this, however, some countries /Finland/ spend as little as 2 to 5 per cent of the budget allocated for higher education on the introduction of or support for educational technology. Other countries /Bulgaria, Czechoslovakia, Greece and Hungary/ could not determine the relevant percentage.
7. Software is produced or acquired by the different institutes of higher education in a most varied manner. In the majority of cases software/ /teaching material/ is produced within the premises of the institute concerned /as is the case in Bulgaria, Czechoslovakia, Finland, Hungary and Rumania, more exactly at one of its departments or with the assistance of the group of educational technology where there is one /Bulgaria, Czechoslovakia, Finland, Hungary and Rumania/. It is less frequent to purchase or obtain software from a central national institution /supplier or distributor/ as in Finland or Hungary or from the "free market" as in Greece. It is surprising that students are included in producing software in an increasing number of countries /Bulgaria, Czechoslovakia, Greece, Hungary and Rumania/.
8. It is revealed by the analyses that for accomplishing didactical tasks set in advance educational technology is used most frequently in the phase of imparting new knowledge /Bulgaria, Czechoslovakia, Greece, Hungary and Rumania/; it is used less frequently at the stage of drilling /Finland, Greece and Hungary/ and rarely (Czechoslovakia, Greece, Finland and Hungary/ or not at all /Bulgaria/ in the phase of checking the acquired knowledge.
9. The information provided by the software and hardware of educational technology is used

	generally	often	rarely	never
to supplement		B, Cz G, R	F	H
substitute or		H, R	B, F	Cz, G
illustrate	E	B, Cz F, R	G	

the material discussed during the lecture.

Note : In the table above and the one coming later the capital letters denote the following countries :

B - Bulgaria

Cz - Czechoslovakia

F - Finland

G - Greece

H - Hungary

R - Rumania

* The fact that the overwhelming majority of the countries responding to the Questionnaire use the method of imparting information by the media of educational technology comparatively rarely for substituting the lecture must be regarded in a positive manner. *Lectures still important.*

10. Projecting slides, screening films or film strips television transmission and language laboratories are the ones to be used most frequently out of the arsenal of the media of educational technology during the lectures, exercises, practice sessions and discussion groups in higher education.

	lectures	discussion groups	laboratory	individual work	Others
a. Projecting stationary pictures accompanied by sound	B, F, G, H, R	F, G, H, R	B, F, H		
b. Projecting movie pictures	B, F, G, H	G, H, R	H, R		
c. Television	B, F, H, R		F		
d. Teaching machines	R		B, R		
f. Multi-media systems			R		
g. Language laboratory		B, F, H, R	F, H, R	R	
h. Computers in education			R	H	
i. Sound systems	G, H, R	F, R	R		

11. Educational technology is used frequently in higher educational institutions offering different qualifications. It is quite striking, however, that in teacher training /Finland and Greece/ and in training agricultural specialists /Finland, Greece and Hungary/ the advantages inherent in educational technology are rarely used.

12. Some countries /Bulgaria, Finland, Greece and Rumania/ responding to the Questionnaire agree that educational technology has a decisive role to play in full time education. Others /Czechoslovakia and Hungary/ maintain that the use of the media of educational technology can largely assist students learning on their own in the case of attending evening or correspondence courses.

13. The media and methods of educational technology aiding teaching activities carried on at the different institutes of higher education are used in general within the teaching periods as stated by Czechoslovakia, Finland, Greece and Hungary. In Rumania, software that can be presented with different media are used even outside the classroom.
14. The importance of educational technology is given by the different higher educational institutions to be of the following sequence : in giving instruction in the basic subjects as stated by Czechoslovakia, Finland, Hungary and Rumania followed by the teaching of the special /vocational/ subjects as stated by Greece, with the sequence to be noted.
15. The countries responding to the Questionnaire recommend the use of the software and hardware of educational technology for the elaboration, naturally in the function of the extent to which demonstration can be used, of the selected chapters of the content of a subject /Czechoslovakia, Finland, Greece, Hungary and Rumania/ or for the elaboration of the content of the subject as a whole /a view proposed by Finland and Rumania/.
16. With the experience gained over the past decade taken into consideration it can be concluded that as a result of the experiments carried out with programmed instruction by Bulgaria, Czechoslovakia, Finland and Hungary that :
 - the teaching material of the basic subjects and those of a technological character is restructured;
 - the role played by individual work increases;
 - there is increased objectivity of the valuation in the process of control and checking;
 - the enforcement of the principles of programmed instruction is significant in training through correspondence courses.

In training based on correspondence courses a considerable measure of guided individualization can be reckoned with.

III. Research on Educational Technology in Higher Education

1. In the countries responding to the Questionnaire research on educational technology in higher education is carried on mostly on the basis of a central research plan /as is the case in Czechoslovakia, Finland, Hungary and Rumania/, or on the basis of the individual research plans of the different higher educational institutions /Czechoslovakia, Finland, Hungary and Rumania/, or it is coordinated within a given higher educational institution with research proper based upon initiatives taken by the individuals /Bulgaria, Czechoslovakia, Finland, Hungary and Rumania/ or no research work is done at all /Greece/.

2. Different examinations have been made in the responding nations. In Czechoslovakia, comparative examinations have been made with the effectiveness of the training of the students of the evening course, in Finland, the use of television in higher education has been studied, while in Hungary, research is being carried on in the following fields :

- questions relating to the content and forms of audio-visual software and the examination of the influence it exercises;
- the methodological and technical conditions of the use of educational films;
- disclosing the possibilities and methods of the application of closed circuit television systems in higher education;
- exploring the methodology and technical problems of modern media and software suitable for screening or being screened within the classroom.

It must be noted here that little is known of the research fields of the countries sending in the Questionnaire because few details were supplied in the answers.

3. There are plans for the international coordination of educational technology in higher education in Czechoslovakia and Rumania within the framework of the Council for Mutual Economic Assistance /Comecon/, or no such plans have as yet been drawn up /Finland, Greece and Hungary/.
4. Incidental relations between the commercial organs and enterprises producing media /hardware/ and materials and distributing them on the one hand and the institutions of higher education on the other are confined, in general, to purchasing one of the media or materials. In most cases there is no department, section or group of educational technology to mediate in this process. There is a certain measure of contact between the two sides in Czechoslovakia and Finland, but no ties have been indicated by Greece and Hungary, meaning that the results of research carried on by the higher educational institutions are only incidentally conveyed to the manufacturers.

IV. The Organizational Structure of Educational Technology in Higher Education

1. In this respect there are considerable differences among the countries having responded to the Questionnaire. Only one of the six nations, Hungary possesses a National Centre for Educational Technology, while in the other five countries there are either regional centres, departments or sections of educational technology attached to the universities as in Bulgaria, Czechoslovakia, Finland and Rumania or there are no centres or departments of educational technology as in Greece.

Conclusions :

Here are some conclusions that can be drawn concerning the conditions for the introduction and spread of educational technology :

- it is essential that the responsible state bodies and authorities should support in principle the introduction of educational technology in addition to giving it moral and financial support;
- it is necessary to launch coordinated research programmes and experiments elaborated on the basis of a central development plan;
- It is a fundamental precondition for the introduction of educational technology to ensure that the staff of the higher educational institutions show a positive attitude;
- * - it is important to establish a new learning situation, that is to say, active cooperation between teacher and student;
- * - it is an essential, but not the only factor, to supply higher education with appropriate software and media /hardware/ that correspond to the international standards and are operational;
- * - cooperation on an international scale is necessary in research.

VI

POSSIBILITIES OF ESTABLISHING AN INFORMATION
SYSTEM FOR THE EXCHANGE OF AUDIO-VISUAL
EDUCATIONAL MEDIA

by

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and

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Technology

The necessity of the establishment of a regional information and exchange system is raised in order to utilize the available audio-visual materials more effectively, to eliminate parallelism in the field of production and with regard to economic and other important aspects.

When a mechanism of such a system extending to several countries or perhaps to several activities is being elaborated it must be taken into consideration that in a number of respects, for instance, in terms of the structure of their educational systems and with regard to the organization of the system of production and distribution of audio-visual materials and aids there are quite a few differences among the countries of the region.

While examining the possibilities it is most convenient to seek what is in common and move forward step by step by relying on the existing national and international organs and organizations, the different forms of cooperation that have already been established among them and on the experiences gained and their utilization to the maximum. While doing so the demands raised by education - which is what is called actual practice - must be born in mind.

The development of education, supplying the schools with audio-visual materials and aids of appropriate quality and quantity constitute one of the most current issues in all the countries having attended the International Seminar. Accordingly, the system of research on, production and distribution of audio-visual materials and aids has undergone considerable changes in recent years and this process is far from being complete. The list of the most important institutions and companies as per country which are engaged with research on, production and distribution of audio-visual materials and aids is contained by the Appendix attached to Topic No.6. /Naturally, the list is not complete but it offers an appropriate basis on which further activities can be carried on./ In addition to the name and address of the institution or enterprise the list also contains the type of the audio-visual material or aid produced /or distributed/ and the educational level at which it is recommended to be used is also denoted. These two aspects are extremely important because when a regional

exchange system is being established the educational level and the kinds of audio-visual aids and materials with which the system should be concerned are questions of top priority. Truly enough problems of curricular development do not figure in the Appendix but it would be wise to consider this point before denoting the individual fields of activity. The experts of this particular field would have very important duties to perform if they were left with the job determining the subjects and themes for which audio-visual materials have been produced that could be used in other countries, or for which such materials could be elaborated jointly by several nations. [This would call for cooperation among the competent institutions of the interested countries followed by the setting up of a regional committee on curricular development. From the point of view of the character of the institutions responsible for this activity there are, at the moment, considerable differences among the countries involved. In Greece, the Ministry of Education, while in Rumania a special institute /ICPEP/ is responsible for the elaboration of the curricula for all educational levels and subjects instructed. In Finland and Hungary, there are separate institutions in charge of the problems of public education and vocational training.]

The Appendix reveals that the activities of some of the institutions extend to planning, designing, production and distribution, while others specialize only in one of these lines. This is probably ascribable to the fact that the audio-visual material and aids were introduced into the different countries of the region in a different manner and, accordingly, this brought about differences in the duties of the institutions concerned.

The complex process as a result of which the audio-visual material and aids reach the schools will be illustrated by the Hungarian example.

In Hungary, the National Pedagogical Institute /NPI/ is engaged with the elaboration of the curricula and the list of teaching aids and the relevant methodology attached to them. It is the duty of the National Centre for Educational Technology to produce the zero series of software made for purposes of public education along with the elaboration of teaching packages and the development of audio-visual materials and aids. The Teaching Aid Producing and Sales Company is responsible for the serial production and distribution of software, while the Textbook Publishing House is in charge of the duplication and distribution of textbooks.

There is a cooperation agreement providing for the coordination of the activities of the above given institutions in the field of research on and development and designing of the teaching aids used in primary and secondary education. Under the agreement the institutions concerned coordinate their plans, inform one another mutually and evaluate the accomplishment of the tasks jointly. A committee called Committee on Teaching Aids has been set up to coordinate the supply of teaching aids for public education.

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The organizational set up of the supply of audio-visual aids and materials of vocational training is also easy to describe. Relevant research and planning are the responsibilities of the Research Institute of Vocational Training while production and distribution are in the hands of the Centre Supplying Vocational Schools with Teaching Aids.

"Long distance" education is a comparatively new field and is the responsibility, in the first place, of school radio and school television, but the National Centre for Educational Technology is also engaged with relevant research.

The activities carried on by most institutes are of several direction. The National Centre for Educational Technology is responsible, for instance, for designing and producing the audio-visual materials, while the Centre Supplying Vocational Schools with Teaching Aids is in charge of their production and distribution. In the case of school radio and school television both planning, production and distribution are in one hand. In the case of audio-visual materials and aids designed for public education, more than one enterprise is engaged with production, since the production of the zero series is the responsibility of the National Centre for Educational Technology and serial production is in the hands of the Teaching Aid Producing and Sales Company. In the field of vocational training the Centre Supplying Vocational Schools with Teaching Aids is in charge of producing, distributing and borrowing teaching aids.

The schools are given credit centrally by the Ministry of Education for making their purchases on the basis of the list of teaching aids compiled by the Ministry of Education; they can also borrow audio-visual materials and aids from the Budapest Pedagogical Institute, the County Film Archives which are subordinated to the local municipal council.

In all the forms of activities the supreme body to which the different planning and producing institutes are subordinated is very important because if all of them belong to the same authority /for instance, the National Centre for Educational Technology, the National Pedagogical Institute, the Teaching Aid Producing and Sales Company and the Textbook Publishing House are all subordinated to the Ministry of Education/ it is much easier to establish cooperation among them. Most of the problems arise at the stage of production because there are overlappings that are difficult to eliminate because the enterprises engaged with production are subordinated to different ministries. For example, each of the film studios run by the different ministries make their own educational films and so it may occur that several films are made simultaneously about one particular subject or theme. In an effort to solve or eliminate such and similar problems the Inter-Ministerial Scientific Coordinating Council for Educational Technology /IESCOTEC/ was established by the Minister of Education in agreement with the other ministers. The National Centre for Educational Technology is in touch with all the ministries and a number of national institutions through IESCOTEC making it possible to coordinate the production of software not only within the sphere of authority of the Ministry of Education but also within that of the other ministries.

It was attempted in the foregoing to illustrate the system of research on, production and distribution of the audio-visual aids and materials in the countries of the region in question from country to country and through the example of Hungary in more detail. In the following we try, on the basis of a comparative analysis of the information obtained, to single out the major factors that can have a decisive role to play in the practical implementation of the exchange of materials.

Of the different educational levels most of the attention is devoted to meeting the requirements of public education, that is obligatory primary and secondary education. This determines, among other things, the character and content of research as well as the system of distribution. The use of audio-visual aids and materials look back on a long tradition in vocational training; that is why in several nations including Finland and Hungary there are separate institutions to be in charge of this field. There has been increasing interest in higher and adult education in recent years, and educational technology has a particularly important role to play in its newly established forms of education such as the "long distance" education.

In most countries of the region there is an independent institute or institutions engaged with designing and conducting research into audio-visual materials and aids and in general they are also concerned with a certain kind of experimental production. As a rule, these institutions closely cooperate with the organs responsible for curricular development which determine the teaching aids to be used along with the curricula in several countries such as in the Soviet Union, the German Democratic Republic and Hungary.

Centralization is of a lesser degree in the field of production. Even concerning nations in which there is a central body or institution responsible for the production of audio-visual aids and materials it is very difficult to give a complete list of the companies involved, not to mention local production carried on within the premises of schools, a trend coming very much into the picture. This picture drawn here applies, above all, to Yugoslavia, the country in which the picture is more complex than elsewhere because of the federal republics the country is composed of; institutions of a similar or identical line operate in each federal republic in Yugoslavia. In Finland, audio-visual aids and materials are supplied mainly by privately owned companies.

The countries having participated in the International Seminar reveal most similarities in respect of their system of the distribution of audio-visual aids and materials. Distribution, as a rule, is directed centrally. Yugoslavia is an exception to this because of the reasons listed above. There are, of course, certain differences to be detected from the point of view of the extent of centralization, the priority given to local demands, and so on. The organ to bear responsibility for distribution in the individual countries of the region is the Ministry of Education or its competent department, or an institution operating directly under the supervision of the Ministry. The audio-visual aids and materials are supplied through the local authorities corresponding to the units of local administration. In Finland, most of the expenses are born by the local municipal authorities.

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absence of any agreement to this effect. In general, the main areas of bilateral cooperation have so far been those of research and, to a lesser extent, propagation. There are examples on hand of joint production : Hungary and the German Democratic Republic made jointly some film strips and slide series about mathematics. Examples that are very isolated and few today can be given an impetus within the framework of regional cooperation. The objective is to build up relations extending to the other forms of activities, to the fields of planning and production, since their strengthening serves the purposes of preparing multi-lateral ties.

The International Scientific Conference on Teaching Aids held by the socialist countries in Moscow in 1974, the second one held in Brno, Czechoslovakia two years later and the third staged by Budapest in 1977 examined the possibilities of establishing multilateral cooperation designed to involve the countries of Comecon/Council for Mutual Economic Assistance/.

A certain kind of cooperation developed among the representatives of the countries attending the Seminar through the activities of international organizations dealing with audio-visual aids and materials. Finland, Poland, Hungary and Yugoslavia are members of ICEM /International Council of Educational Media/ the activities of which extend to ensuring the exchange of information, facilitating international relations, and training specialists of educational technology. Finland participates in the cooperation, educational and research activities of the Council of Europe. In certain special questions and fields the International Labour Office /ILO/ and CEBES, UNESCO's centre of higher education in Bucharest can also offer assistance for international cooperation.

From the point of view of international experiences that can be exploited special attention must be paid to INTEFILM-INFOFILM, an organization operating within the framework of the Scientific and Technological Information Centre /STIC/ of the European socialist countries, the basic institution of which is in Budapest. The organization comprises six members and processes the data supplied by some 4,000 scientific and technological films annually /made either by one of them or imported from other countries/. In a short time the organization will embark on the processing of data by computers and the exchange of the copies of the films is designed to commence in the near future.

While examining the possibilities at disposal the question was approached in the foregoing from the viewpoint of the existing and available organizational framework and experiences, but the audio-visual educational materials and aids constituting the object of the exchange and the practical problems associated with them were not dealt with. It must be underlined, however, that in the event of establishing an information system it can be considered as one of the fundamental questions to find a solution to the problems of uniform standards, special terminology and documentation /uniform files and records/.

*This already done in USA. Handbook Series.
All states mandated to use Handbook
II-R.*

Paris, November 1977

Original : English

It is quite obvious that the information system must be engaged with the software existing and used in the countries of the region. They include film strips, slide series, slide series accompanied by sound, sound and video recordings, school radio and school television transmissions and programmes. Materials that correspond to the demands of users in another country or can be used with little if any adjustment must be selected to act as the objects of exchange. On the basis of the Questionnaire sent out to be answered before the Seminar and what was actually voiced during the sessions at the Seminar it can be stated that 16 mm film strips, slides, slide series and slide strips are most commonly used in public education. Of the kinds of sound recordings, bands, cassettes and gramophone records are equally used.

Slide series accompanied by sound, transparencies for the overhead projector and video recordings are not yet adequately widespread although there is demand for the exchange of aids and media of this kind. Possible differences in the standards must be eliminated both on a nationwide and regional scale.

It is impossible to keep uniform files and records without a uniform special terminology. In this field, only the initial steps have been taken to date. Within the framework of the International Pedagogical Cooperation of the Socialist Countries /IECSC/ a multilingual dictionary has been compiled containing the terminology necessary for the subject of measuring performance and evaluation in the school. The elaboration of special dictionaries of a similar type is an item in the working plans for bilateral cooperation. In Rumania, for instance, a special pedagogical dictionary and an audio-visual encyclopedia have been compiled. In 1976, the first volume of the Hungarian Pedagogical Encyclopaedia - planned to run into four volumes - was published. Mi PP

The question of the documentation of the audio-visual aids and materials is another one awaiting a solution. In the countries of the region so far a uniform cataloguing system has only been worked out for the film strips within the frame of LIFE FILM-INFO, an organization mentioned earlier. Examinations conducted up to now and international experiences gained to date show that it is quite possible to elaborate a similar system of cataloguing for the rest of the audio-visual materials and aids, but this is a task needing maximum precaution which is one of the preconditions of establishing an information system.

1977! The problem of processing the data of an information system of such broad dimensions can only be solved with the aid of computers. Although this is an issue to be settled only in the long run, it is worth noting that in Czechoslovakia a system based on processing by computers and suitable for the documentary purposes of the audio-visual educational aids is already in service, and similar systems are designed to be introduced in the Soviet Union and in Bulgaria.

Different methods and systems have evolved in the individual countries in connection with research on, production and distribution of audio-visual educational aids and materials and with the related problems. Regional cooperation necessitates the establishment of a mechanism stimulating the organization of the national systems. At the same time it should make it possible to use the existing ones in the meantime.