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ABSTRACT

Twelve multi-media adult education projects in nine countries are described in this 250-page book. The projects include England's Open University, Japan's Broadcast Correspondence High School and University of the Air, West Germany's Telecolleg, The Netherland's TELEAC, France's RTS-Promotion and Tele-CNAM, Poland's Politechnika Telewizyjna, and in the U.S., the Chicago TV College. The first section of the book outlines eight steps for building an efficient out-of-school instructional media project. The steps are: formulation of the educational problem, definition of the instructional objectives, definition of alternative media systems, identification of limiting conditions, evaluation of alternative media systems, planning the hardware and software, implementation of the project, and continuing evaluation and modification. Each of the case studies includes data about the background, organization, and current operation of each project. One of the case studies, Japan's Broadcast Correspondence High School, also includes data about costs. (MG)

Multi-Media Systems in Adult Education

Twelve Project Descriptions in Nine Countries

Internationales Zentralinstitut
für das Jugend- und Bildungsfernsehen

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Introductory Note

Together with the Council of Europe, the Internationales Zentralinstitut für das Jugend- und Bildungsfernsehen (International Central Institute for Youth and Educational Television) organized a Study Course held in the Munich Broadcasting House from April 29 – May 5, 1971, dealing with the subject: "The Application of combined Teaching Systems and the New Aspects and Functions of Education which depend upon them – Methods of Total and Partial Programmed Instruction".

On the occasion of this conference, the participants were presented with an initial version of the present compendium, intended to serve as a basis for their work. In the meantime the national reports submitted by the countries represented at the Study Course, the latest information on the projetcs already described in the initial compendium, as well as the results reached by the working groups during the conference have all been applied for revising the initial version and have been included in the present final compendium.

We would like to take this opportunity to thank the persons in the many countries concerned who assisted in this careful and precise revision of the individual projects. Our sincere thanks also go to the Bundesministerium für Bildung und Wissenschaft (Federal Ministry of Education and Science, Federal Republic of Germany) and to the Council of Europe for the funds they contributed to the republication and printing of the compendium in English, French, and German.

Munich, December 1971

Internationales Zentralinstitut
für das Jugend- und Bildungsfernsehen

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Preface

The initiative for the publication of the present compendium came from the many studies and statistical surveys that indicated the problems to which the educational system in our modern industrial society is subject. The principal problems described in this publication are the unequal chances of education in regional and social terms, the very rapid increase in the number of students and young people still attending school, the shortage of classroom facilities and funds for enhancing school capacities, the need of the economy for better and more versatile educational opportunities, the lack of teachers and effective further training schemes for teachers, and last but not least the insufficient flexibility of the traditional curricula in view of the constant change of society and its consequential demands and requirements.

Attempts made at improving this situation in the 1950's and 1960's showed clearly that society cannot expect the traditional methods alone — construction of a greater number of educational and training facilities, improvement and expansion of the institutions for the training of teachers — to suffice in solving these problems rapidly and effectively. This in turn is precisely why modern educational technology has become more and more significant and plays an increasingly important role both in the light of public interest and educational policy. The carefully planned utilization of the new instructional media and technologies, especially educational television and radio projects linked with traditional methods of instruction and learning, appears to be a possible approach by means of which the educational system of our modern society will be able to avoid this critical situation.

It is this concept that underlies the present compendium. In the first section of this publication titled "Systems Approach and the Development and Planning of Media Systems" it is shown which systematic considerations are required in the preparatory and realization phase of media systems in order to guarantee that media-oriented instruction schemes will be successful in terms of their organizational structure and in view of the learning situation. As, when planning media systems for school education, the variables to be considered are different from those applicable in out-of-school education (adult education and vocational training), the models presented here are confined to the latter field, i.e. out-of-school education. Nevertheless, the basic steps and concepts naturally also apply to the planning and development of media systems for school and university education.

In the principal section of this compendium, the planned utilization of television and radio at various levels of the educational system is demonstrated by 12 project analyses carried out in 9 industrial nations. The majority of the projects described have passed the experimental stage and are at present making definite contributions to solving problems of the educational systems in the countries concerned. In presenting these projects, mention has not only been made of the success they have had and the advantages they offer, but also of the difficulties that had to be overcome in the phases of organization and realization. The experience gained in this manner will be of great use for the development, planning, and realization of similar schemes in other countries. The projects presented here are impressive and convincing proof of the fact that educational television and radio have stood the test. There can be no doubt that television and radio combined with traditional styles of teaching and learning are just as effective — or even more effective in certain fields of application — as conventional instruction, while simultaneously providing the possibility of being able to reach a greater number of learners at less cost.

To prevent any misunderstanding, it should be emphasized at this point that the media approach is by no means intended to replace the teacher and conventional instruction methods and would indeed not even be able to do so. In accordance with

findings established in the theory of learning and developmental psychology, instruction within a media system is based on a distribution of functions between the new media and the conventional teaching methods, each type of instruction being applied in the teaching process in line with its specific potential. Thus, direct contact between the teacher and the learner is a central aspect of the instructional strategy even in a media system. This specific part played by the teacher is shown and analysed in a special paper prepared in connection with the report on "Telekolleg".

The compendium comes to an end by providing an impression of how the modern communication media will develop in the future in the light of satellite technology. The paper "Communication Satellites and Education" first describes the various stages of satellite development and then discusses the communication potentials made available to the educational cause by the virtually enormous propagation capacities offered by satellites. Finally, this paper deals with the difficulties of economic, political, and instructional nature which will arise from these developments and which must be solved before satellites can be used to meet the constantly increasing need for communication in the fields of education and science.

I sincerely hope that the present compendium will encourage educators, producers, and politicians to utilize the new communication media and technologies both at schools and universities, and in vocational training and adult education. I am convinced that the close cooperation of the responsible persons in government offices and educational administration, in the broadcasting organizations and educational research institutes, as well as the international exchange of experience and international collaboration, will serve to solve a great many of the problems inherent in today's educational system.

Munich, December 1971

Helmut Oeller
Television Director of
Bayerischer Rundfunk

I.

The Systems Approach and the Development and Planning of Media Systems

Some considerations for planners

Toward a definition of the "systems approach"

The systems approach is not a set, established thing with clear cut rules to follow in dealing with all problems. It is rather *one* way of thinking than *the* way of acting. A way of thinking, which since long is common with engineers and all others in applied science concerned with the solution of real world problems. Generally speaking, the systems approach includes the following features or elements (see 19):

1. *Design of action*

Scientists have long known that in research finding the right questions to ask, i. e. formulating the hypothesis, is half the battle, the idea being that only after you know clearly just what it is you want to learn can you proceed to come to grips with your problem. An analogous principle holds when it comes to shaping administrative policies. The first job in dealing with such problems is to identify exactly what has to be done, which means defining objectives and more than that — defining objectives in operational terms, in ways that demand concrete action. Criteria are then selected which measure how well the objectives are being met and determine when those objectives have been reached.

2. *Seeking alternatives*

So once objectives and criteria have been determined the next step calls identifying and spelling out different methods of meeting them. Concentration on alternative methods for achieving the objectives often has resulted in the invention of cheap solutions which would not otherwise have been thought of. This step demands creativity, open-mindedness and readiness to discard preconceived notions. Even in cases where the general strategy for achieving certain objectives is predetermined by given unchangeable conditions, alternative solution models should be developed by relating the elements of this solution strategy in different ways to each other, resulting in different combinations, each having specific advantages and disadvantages to reach the desired set of changes.

3. *Evaluation*

One mark of a really complex problem is that it generally involves a number of objectives not all of which can be fully attained. This means that a realistic plan depends on trade-off and compromises. The "system" part of the systems approach comes in most strongly at this stage. A full-fledged analysis will attempt to evaluate the different alternatives by maximizing the benefits or utility to be obtained for a given cost or by minimizing the price which must be paid to achieve specified changes. Alternatives are generally evaluated in numerical terms indicating e. g. how much money will be spent in a certain period of time. But qualitative factors are always to be considered along with quantitative factors. There are always political implications, questions of morale and other factors which may not be readily measurable but must

be taken into account to find a workable solution for the stated objectives. Finally evaluation is a repetitive process. A plan must be monitored to check its current effectiveness, modified if necessary, checked again, remodified, and so on. Continual assessment involves sensitive feedback, cycles of evaluation which permit prompt readjustment of tactics to make sure that the system is moving toward its objectives.

Systems approach is not the answer to a problem, but it represents an orderly scientific way of finding the best answer. It is a well-arranged procedure which is structured in such a way prejudiced opinions are minimized and the objectiveness necessary for finding a reliable scientific solution to a problem is maximized.

Originating from engineering, systems approach has in the meantime been taken over by the planners and decision makers within many other areas of society. Only recently, systems approach was being discussed in respect of its application in education, especially in connection with the *new media*, for the purpose of solving problems we are faced with at present.

The application of systems approach to "media systems" (see 14 and 15)

What does the new cryptic term "media system" mean? Media systems are instructional systems which by the use of media provide instruction at a distance from the original source of the materials.

The media utilized in media systems include printed materials, sound film and tape recordings, radio broadcast and closed circuit television, picturephone, telephone, talking book, sound page, and the like. They all have in common that they are able to represent a complete body of information and by virtue of this make verbal explanation of the instruction by a teacher unnecessary. The idea of the media system assumes that the best results of learning are obtained when, in accordance with specified instructional objectives and characteristics of the target audience, media are combined in a deliberate way with each other and with lectures, seminars, tutorials, laboratory experiments and field experience. The teacher and conventional forms of instruction, as pointed out, are not excluded in media systems but a deliberate division of labour between these methods of instruction and the instructional media is tried. This view stresses that some tasks the teacher traditionally performs can better and more economically be achieved by instructional media, whereas for other specific functions within the system, the teacher is optimal.

The large number of instructional media and the great variety of teaching forms and learning aids that can be combined with them makes careful planning for media systems necessary. There is not only one combination which can be utilized in meeting a specific set of instructional objectives and to serve a certain student population, but many. Thus, the problem is not only to choose a possible combination from the various solutions applicable, but to choose the most effective, economical and — within the framework of a definite structure of society — most practical combination.

A second set of problems for the planner arises when the decisions are made, which media to select and with what other teaching forms and learning aids to combine, how the reception situation should look and which function tutors or teachers have to assume. Whether or not the students will reach the instructional objectives for which the media system is designed, will depend to a large extent on its completeness and on how well the several elements are fitted together.

All the requisite components of an instructional system must be there, available to a sufficient extent, must function perfectly and be well adapted to each other. A powerful television signal and a poor programme, or a good programme being presented to participants not knowing what to do with it, are conditions that will quickly subdue all the expectations invested in a given project. In many cases, when a project turned out to be a failure, it later became obvious that a significant component of the media

system was either missing completely or did not function properly. Either the various resources were not allocated correctly among the decisive components — in this way creating a kind of disequilibrium — or the feedback system for revealing and eliminating difficulties and errors did not operate as it should. It is true that it is possible to correct and improve on all these factors; if however, they are anticipated by a systematic planning work the system will function with fewer problems from the beginning.

The procedure for solving problems on the basis of systems approach ensures

1. that, when developing, planning and carrying out media systems for defined instructional objectives and a certain target audience, the best combination of media and other teaching forms and learning aids is selected within the context of a given society, and
2. that the individual components of the media system are combined to a dynamic, well-arranged integrated whole, in which the entire scope of single endeavours to reach the specified objectives and to serve the target group are co-ordinated in the best possible way.

Next, we will indicate the most important steps and questions involved in developing, planning and carrying out media systems for out-of-school instruction with the help of the systems approach. Media systems can be used for in-school or in-university instruction, as well as for out-of-school education (e. g. adult education, vocational training). Because different variables will have to be considered in planning a media system for the two different settings, we will concentrate in the following discussion on the latter.

1. *Formulation of the education or training problem*

The first step to be taken when proceeding on the basis of systems approach is to define the problem. In so doing, not only the concrete educational problem should be taken into consideration, but also the general social problem underlying it, for which the instructional system to be developed constitutes at least a partial solution. Furthermore a rough outline of the content and the target audience of the proposed instructional programme is presented. Essentially, the first step of the systems approach presents the general idea of the project to be developed and its political "rationale".

2. *Definition of the instructional programme*

Once the problem has been formulated the next step is to define in detail the instructional programme, which will solve it. The two defining characteristics of every instructional programme are its instructional objectives (knowledge and skills to be imparted) and the target audience, that is the group of people which after having completed the course successfully will solve the stated problem by applying the knowledge they have acquired and the skills they have learnt. The definition of the instructional programme in terms of the major instructional objectives and of the target audience is the most important step, because all consequent activities developing the media system will be controlled by it. The definition of the instructional programme determines to a large extent the media requirements of the instructional system to carry it through. This interaction will be discussed in the following sections.

a) *Instructional objectives and media requirements*

The nature of instructional objectives (see 4). The term "instructional objectives" refers to the performance of the student upon having successfully completed the programme of instruction. If they are to be of practical use and suitable for application, instructional objectives must be phrased in definite observable and measurable terms: what must a student do to show that he has studied successfully and can finalize the programme? Stated differently, it may be said that acceptable statements of instructional objectives contain two principal elements, the "do" (say, do, state, compute, explain,

define) and the "what" (area of a circle, diameter of a cylinder, verbs in sentences) element. These may be labelled the behavioural and the content elements of the statement of the objectives. In some cases the statement also would indicate the acceptable standard of student performance; these are cases in which performance other than all correct or all wrong may be anticipated, or cases in which time limits should be set.

The knowledge, skills and viewpoint held by the students on commencing the instructional programme must be taken into consideration when the instructional objectives are formulated. The instructional objectives should be built on prior educational experience which are common with all students, so that all of them have the same chance from the beginning and no group is disadvantaged.

In summing up, it can be said that the thinking in terms of instructional objectives rather than in pure subject matter categories implies a new view of education. When instruction is approached in this way the focus is shifted from process to product and from teacher-teaching to learner-learning.

Instructional objectives, type of learning and media requirements (see 3, 4 and 11).

Instructional objectives can be formulated on different levels. For system design, with which we are concerned now, the major instructional objectives of the programme defining and describing the role or task the student will have to perform upon completing the total programme is sufficient whereas on the materials production level (see p. 18) the major instructional objectives have to be broken down to the level of every programme unit stating exactly what has to be achieved in every half hour of a television course or a certain chapter of the accompanying written material.

The practical value of the instructional objectives is, beside specifying how the students' learning can be evaluated that they provide guidance for the design of the instructional system, because they carry the basic information needed to identify the required type of learning (e. g. learning of factual information, learning of principles, rules or concepts). The required type of learning to realize the instructional objectives in turn determines the media requirements of the instructional system, because the type of learning is closely related to the mode of information representation which is a defining characteristic of the instructional medium. Media research indicates that, although all media can be successfully applied for instruction, some classes of media are more effective for certain types of learning than others. The empirical findings on the relationship between type of learning and instructional media classes are tentatively summarized in Table 1.

The relationship between the instructional objectives and the type of learning involved on the one hand and the type of learning and the mode of information presentation on the other leads to the definition of media requirements for the particular instructional system. The class or combination of classes of instructional media which *best and most economically* meet the demands should be selected.

It can also be seen in Table 1 that, although media can do most things, they cannot do them all. If the realisation of the instructional objectives involves to a large extent the learning of motor skills or changes of attitudes, opinions and value orientations, mediated instruction must be supplemented. Laboratory work or field experience is best suited for the learning of motor skills whereas teacher guided group discussion seems to be most conducive to personality development. Thus, from the analysis of the instructional objectives not only the media requirements can be inferred, but also the requirements for supplementary non-mediated instructional activities.

Table 1: *Instructional Media and Types of Learning*

Major Classes of Media by Mode of Information Representation (see B)	Major Types of Learning						
	Learning of Factual Information	Learning of Visual Identification	Learning of Principles, Concepts, Rules	Learning of Procedures	Learning of Verbal Skills	Learning of Skilled Perceptual Motor Skills	Learning of Desirable Attitudes, Opinions, Motivations, Value Orientations
Audio-Motion-Visual Media (Television, Picturephone, Sound Film, Video-Tape, etc.)	Medium	High	High	High	High	Medium	Medium
Audio-Still-Visual Media (Still-Picture Television, Sound Filmstrip, Sound-Slide Set, etc.)	Medium	High	Medium	Medium	High	Low	Low
Audio-Semi-Motion Media (Telewriting, Recorded Telewriting)	Medium	Medium	Medium	Medium	Medium	Low	Low
Still-Visual Media (Facsimile, Printed Page, Filmstrip Picture Set, etc.)	Medium	High	Medium	Medium	Low	Low	Low
Audio Media (Telephone, Radio, Audio-Disc, Audio-Tape)	Medium	Low	Low	Medium	Low	Low	Low
Print-Media (Teletype, Punched Papertape)	Medium	Low	Medium	Medium	Low	Low	Low

b) *Target audience and media requirements (see 7)*

The characteristics of the target audience are the second set of information defining the instructional programme. Besides the entry behaviour of the students which was already utilized in formulating the instructional objectives, the following information on the target audience is relevant for the system design:

- Number and regional distribution of students in the country. Size and geography of distribution area.
- Age, sex, family status, education and socio-economic status of the students.
- Vocation; profile of an average work day; satisfaction with the work; vocational plans.
- Leisure time activities; membership of clubs, associations and other organisations; activity profile of an average weekend.
- Living conditions and equipment; space; communication facilities like radio, telephone, television, etc.
- Attitudes toward newer media (television, radio etc.) as instruments for instruction.
- General level of learning motivation and level of learning motivation concerning the specific subject matter.

The size and the regional distribution of the target audience, the social and psychological characteristics of the students and their living circumstances are decisive factors for further specifications of the media requirements in the instructional system. In the foregoing step, the modes of information representation required by the instructional system were delineated, now the required mode of information distribution and the type of information reception will be identified. This is done by relating characteristics of the target audience to the different systems of information distribution and to the type of information reception. What is meant by "systems of information distribution" and "types of information reception" will be explained in the following paragraphs.

There are two types of information reception; these are individual reception, if the student receives the instruction apart from other students, and group reception, if he receives it together with other students. These two types of reception situations relate to the nature of the target audience. If the target audience consists of highly motivated students, individual reception is adequate whereas with low motivated students group reception seems to be required. When mediated instruction is received at home, learning depends heavily upon individual internal motivation. In these cases we find high non-start and drop-out rates; only highly motivated students survive. In spite of all efforts, guidance and inspiration of students with weak learning motivation has not yet been achieved. It seems that only the group with its morale building capacities can stimulate the students sufficiently and keep up learning motivation in these cases. Therefore in many projects either group reception of the mediated instruction or occasional resident periods with group activities, in cases where the student population is dispersed, are included not only because, as has been pointed out earlier, certain types of learning cannot be sufficiently achieved by instructional media, but because of the increasement of the holding power of the instructional system when group action is built in.

According to their mode of information distribution, instructional media can be categorized in tele- and recording media. Telemedia are media like television, facsimile and radio, which are capable to transmit electronically information in real time. The important implication of this type of information distribution in our context is that the scheduling of the information, i. e. when (day and time) the information can be

received, and the pace of information processing by the receiver is *externally regulated*. Recording media are media like video-tape, sound-slide-set, printed page and audio-tape, which are capable of recording information, storing it and playing it back at later times and at different places. The implication of this type of information distribution systems is that the scheduling of the information and the pace of information processing by the receiver can be *individually or group specifically controlled.*

The different types of media have different implications as far as their logical power and their adaptability to individual differences are concerned. On the other side, the characteristics of the target group determine the media requirements in terms of logic and adaptability. If we match both we can read the type of media which is most adequate for a certain target audience.

In Table 2 the relationship between selected characteristics of the target audience and the type of media and nature of the reception situation, which best meet them, are shown. This is only *one example* to illustrate the interaction between target audience characteristics and the choice of media and reception situation. In real world situations much more variables will enter the picture in this decision making process.

Table 2: *Relationship between selected characteristics of the Target Audience, the Information Distribution System (Telemedia or Recording Media), and the Nature of the Information Reception (Individual or Group Reception)*

Composition of the target audience concerning intellectual, social and psychological characteris'ics		Geographical distribution of the target audience[1])	
		Students are widely dispersed in the country	Students are concentrated in a number of places
Homogeneous student population (similarly in scheduling time for the programme and similar pace of learning within certain tolerance limits can be assumed)	Motivation: High	Telemedia Individual reception	Telemedia Individual reception and/ or group reception
	Motivation: Low	Telemedia Individual reception + occasional resident periods	Telemedia Group reception
Heterogeneous student population (scheduling time and pace of learning can be assumed to be widely different)	Motivation: High	Recording media Individual reception	Recording media Individual reception and/ or group reception
	Motivation: Low	Recording media Individual reception + occasional resident periods	Recording media Group reception

[1]) Size of target audience and size of distribution area is held constant.

Where do we stand now? What have we inferred from the definition of the instructional programme for the design of the instructional system to carry it through? We know which class of medium according to the nature of information presentation and the type of information distribution system is most adequate to carry the programme through. We do not know the exact medium or media to be selected but we know the range of media which are applicable. Furthermore, we know how the reception situation should look; we know if or if not the mediated instruction should be accompanied by face-to-face instruction and what function the direct teaching situation will serve within the system. We know quite a bit but our knowledge is still too vague to make final decisions.

3. *The development of alternative media systems*

The boundaries within which the solution for the instructional problem has to be found are delineated in the preceding step. The step that comes now is to formulate the different solution alternatives or model media systems which all would satisfy the outlined media requirements of the instructional programme. At this stage in the problem-solving procedure there are no limits whatsoever to the creativity and imagination of the planners. Since this is not the time to discard or evaluate any solutions, and since this is the time to generate all possible solutions within the stated limits, so as not to miss the really good one, this step should be done in an atmosphere of complete intellectual freedom and with participation from as many different groups of people as possible (broadcasters, teachers, politicians, administrators, etc.).

The base for this brain-storming process is formed by a catalogue of instructional media organised in such a way that the logic, adaptability and learning characteristics (refer to Table 1) of the several media can be readily determined. The instructional media organized in such a way that the logic, adaptability and learning characteristics (electronic transmission = telemedia, transportation = recording media) and the type of information representation (audio, picture, line graphic, print, motion):

- *Audio-Motion-Visual Media.* These are the most universal media. All information which can be represented in audio and visual categories can be communicated via these media with the addition of motion (see 3):
  Telemedia: television (open circuit, closed circuit), picturephone
  Recording Media: recorded television (video-tape, video-disc), film-TV recording, sound film (8 mm, super 8).
- *Audio-Still-Visual Media.* These media are capable of everything Audio-Motion-Visual Media can do except the representation of motion.
  Telemedia: still-picture television
  Recording Media: recorded still-picture television, sound filmstrip, sound-slide-set, sound-on-slide, sound-page, talking book.
- *Audio-Semi-Motion* Media. Media of this class are called semi-motion because they are capable of pointing and build up but do not include the capacity to transmit or record full or realistic motion.
  Telemedia: telewriting
  Recording Media: recorded telewriting.
- *Still-Visual Media.* These media represent information with all the visual methods, but do not represent sound information and motion.
  Telemedia: facsimile (book, correspondence course)
  Recording Media: printed page (book, correspondence course), filmstrip picture set, microform (microfilm, microfiche), video-file.
- *Audio* Media. These media are using only sound for information presentation.
  Telemedia: telephone, radio
  Recording Media: audio-disc, audio-tape.
- *Print-Media.* These media can represent information only on alphanumerical or symbolic terms.
  Telemedia: teletype
  Recording Media: punched papertape

In the course of this brain-storming process several media system alternatives will be presented. Among other items the individual presentations would provide the following data on the alternative instructional models:

- Which medium or media are to be used as carriers for instruction? Why were these media selected and not a different constellation? State the reasons herefore,

both in terms of theoretical and practical considerations. If there is more than one instructional medium applied, what different functions do they serve and how do they relate to each other?

- By which type of direct teaching activity or group work (if any) and to what extent is the mediated instruction supplemented in order to provide learning situations not sufficiently covered by instructional media? State the reasons.
- What is the structure and function of the reception situation for the mediated instruction (individual or group reception or both)? State the reasons. How does it look like in terms of equipment and space; where should it be located and how dense will the net of viewing centres in the country be?
- Which are the qualifications the technical and pedagogical staff required must have for carrying out the project?
- What should the organisation of the project be like? What are the initial launching costs and the maintenance costs for the project? How much time must be allocated for project realisation (timetable)?

In order to make this step within the systems approach successful, much more information should be available on the media as has been provided on the above classification. We so far lack an important auxiliary instrument, namely a so-called "media taxonomy". "Media taxonomy" refers to a compilation in which the major communication media on the market and in the developing stage are listed, defined and described both in terms of their mode of function and in terms of semiological, psychological, social, economic and planning considerations. In addition the mutual relationships of the various media, and the relationships between these media and other teaching forms and learning aids should be indicated in this compilation.

As long as such a "media taxonomy" is not available, educational planners have to depend on their experience in developing alternative media systems for a certain instructional problem, an experience which has in a number of cases turned out to be too one-sided, not detailed enough and not sufficiently reliable.

4. *The identification and description of limiting conditions*

The world in which we live does not permit the implementation of just any solution. The tolerance limits within which the media systems must remain in order to be realistic are formed by the respective ecological, technical and economic possibilities and the political situation of a given society. In this context, the following aspects are of importance:

- The size and geographical structure of the country;
- The structure and the organisation of the existing educational and training system;
- The density and state of development of the communications network (radio, television, telephone, postal services etc.);
- The long-range educational goals and the communication policy of the country;
- The potential of teachers or tutors and technicians available;
- The financial situation of the country at present and in the long range.

From the outlined limiting conditions we can now deduce the social requirements that must be fulfilled by a solution to the problem, as long as this solution is to be realistic. Some details as to the structure of the media system, which result from the characteristics of the society, are as follows:

- The instructional media which can be used (television, radio, video-tape, disc or other tele - or recording media) and to what extent (broadcasting time, length of broadcast);
- The form of organisation which is possible for the reception situation (individual or group reception or both, and in the case of group reception: where, i. e. in co-operation with which organisation, associations or school, can group reception be organized?);
- The potential of teachers or tutors available, if any, to be employed for the students;
- The amount of money available to launch the project and to maintain it over a certain time;
- The time which is available for project realisation;
- The demands concerning the technical apparatus involved, both as regards to the degree of standardisation and regarding maintenance.

5. *Evaluation of alternative media systems and the selection of the most efficient and practical one (see 14 and 15)*

Now our systems approach has reached a stage where we must be very critical. Our task is to find the best and most realistic solution among the variety of stated possibilities. This step must be taken in a disciplined manner and with scientific thoroughness, as there is otherwise the risk that errors and distortions will arise, making the entire systems approach useless. The requirements which the solution chosen by society will have to comply with have been presented under 4 and the structure and qualities of the alternative instructional model were shown in step 3. Now these two steps must be brought together. Statistics have worked out numerous mathematical models for the purpose of rating various alternative solutions to a problem and selecting the most effective solution. However, the drawback in this case is that the mathematical model is usually more exact than the data compiled on the individual solutions. Thus it is sufficient for our needs to evaluate the individual alternatives on the basis of a +, 0, — pattern in view of the limiting conditions. After this semi-quantitative rating the possibility provided by each solution is to be observed and examined critically. It is not sufficient to merely add up the + and — marks, and to select that solution which has the most + ratings, as the individual selection criteria are of varying importance. At this stage of the decision procedure, consideration should also be placed on experience, common sense and a good and objective judgment. Every year millions are wasted, simply because the result of a radical mathematical analysis is considered to be the ultimate truth. In doing so, it is forgotten that the calculation may be correct, but the data applied were not exact or sufficient. On the other hand, numerous executives have ruined their companies because they failed to rely on objective analyses and made all decisions by solely depending on experience and intuition. The best method of finding the best possible solution among the alternative solutions available seems to be a well-balanced mixture of rigorous statistical analysis providing objective evidence and information, and of a judgment made on the basis of previous experience.

6. *The planning of the media system and the production of its soft ware*

The media system, which may be regarded as the best and most economical one to carry through the instructional programme in the defined social setting, has now been identified in its overall organisation and structure. The next step is to plan both the sending and the receiving end of the instructional system, and also to do the preparatory work necessary for a detailed implementation of the whole project. The main planning components are:

a) The technical equipment — operation and maintenance;

b) Production of the instructional material and organisation of the reception situation;

c) Supporting communication and evaluation;

d) Training of the pedagogical staff.

Although the focus on the planning work will vary according to the medium used and the other structural parts of the instructional system, the components will remain essentially the same.

a) *The technical equipment — operation and maintenance*

This heading refers primarily to the production and broadcasting equipment and to the facilities at the broadcasting station and for reception (i. e. the various facilities linked with the task of receiving the programmes). It also relates to the problems connected with providing, installing, operating and maintaining the technical instruments and apparatus. In addition, this item also includes the task of recruiting and training the personnel which is to operate and service the technical facilities. It is true that educational planners and educators must rely on the technicians and engineers in the planning team as regards the questions of providing, installing, operating and maintaining the technical equipment.

Nevertheless, it is advisable for the educators to inspect some similar media systems in other countries and to compare the experience made there with their own considerations before giving their consent to the implementation of the technical part of the project.

b) *Production of the instructional material and organisation of the reception situation*

Let us recall shortly what decisions are already made up to this step and how much leeway is left. The major communication channels in the instructional system — the type of media, the nature of the reception situation, the amount of direct teaching and group work necessary — have been determined and the instructional functions of these different system parts, as well as the content they should cover have been defined.

Although it might seem that much has been accomplished, the major job to be done is still left. Now the television programme, the correspondence course — if they are part of the media system — must be produced, the guidelines for the teachers or tutors for their role in classroom work have to be prepared, the work to be done by the students in self-study must be outlined, the interaction between these various channels of learning organized and the test programme worked out.

There are so many decisions in the production process involved that, if we do not proceed in a systematic way in taking them, the whole approach we have followed so far will be useless. That is why the systems approach should be followed also on the micro-level that is in producing the instructional material. A team of experts from different fields should co-operate in the material production phase, also the students, the ultimate consumer, and the teachers who will have to use the material, should take part in the production phase, in order to secure later acceptation. The following steps are relevant in producing a course either on tape, on film or on paper.

— Specification of the instructional objectives[1]) in terms of what responses the student is expected to be able to make when he has completed the programme or programme unit. This is a job for subject matter experts;

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[1]) The instructional objectives which have been outlined in sufficiently precise terms to structure the overall media system are not formulated so as to be of use in the programme production phase. For programme production the major instructional objectives have to be broken down to the level of every course or programme unit; furthermore the acceptable standard of student performance has to be stated and tests to be developed to evaluate student performance.

- Then a strategy of learning is devised: where does the student begin, what logical paths will lead him most efficiently toward the desired goal, how much repetition will be needed, what kinds of examples, etc.;
- Programmers then fill in this outline by writing a series of stimulus-response items — questions which the student is expected to answer, blanks he is expected to fill in, and the like;
- Now the media specialist comes in and rewrites together with the subject matter expert the manuscript in the language of the respecting media, that is, e. g. the manuscript is remodelled into a filmscript whereby best use of all film production techniques for the presentation and communication of the content is made;
- Then the programme is produced, edited and duplicated;
- Section by section, the programme is now tested on students, first on individuals, then on a group. If they make too many errors, or find it too easy, or become confused at any point, the items are revised. Finally, the programme is tested on a large number of students. A psychologist who is specialized in testing will in this phase co-operate with the subject matter expert.

Every course which is produced in this way whether on film, tape, or paper is in the genuine sense of the word a programmed course, because it carries all the characteristics of programmed instruction or programmed learning, as there are:

- the instructional objectives are clearly defined;
- the learning material is carefully sequenced;
- the learning steps are kept simple and short;
- the student responses or participates in the instructional process;
- responses receive some kind of immediate feedback;
- thus, the student is corrected immediately and frequently given advice on how to correct his errors or he is reinforced immediately for his correct answer and motivated to continue.

But in your concern with producing excellent instructional materials and to provide efficient technology to deliver these products, do not loose sight of the receiving end of your system. The main purpose is not merely to deliver good teaching and good materials to the student homes or study groups but to make learning occur there. This does not happen without being carefully planned. As pointed out earlier, instructional media in almost any case are notably more effective if they are received in a well-advised learning group. The teacher or tutor who will supervise the study group will need exact instruction and guidance and probably some training on what he should do and how he should behave and how his instruction is to be related to the instructional media. If relatively untrained tutors or unqualified teachers are used, then it is advisable to build an in-service training programme into the system. If the students receive the instruction individually in their homes, then other two-way communication possibilities should be planned — correspondence study perhaps, or an opportunity to send in papers to be graded or telephone consultations or itinerant teachers.

The result of this stage is, apart from tapes, films, written programmes, tests, information and instructions for the teachers, an exact *project schedule* for the students and the teachers and tutors, showing the interaction of the individual components within the instructional system. This project schedule must inform the students of the objectives and the contents in each individual television programme, tell them when the programmes will be broadcast, and, in the case of group reception, where the programmes can be seen, when and where supplementary discussions and lectures will be held in conjunction with the broadcast instruction, which section of the written accompanying material or of the correspondence course must be studied in connec-

tion with each respective programme, when excursions are planned, which purpose these excursions serve and how they will be organized, which books the students must use and, last but not least, when and to whom they are to submit certain exercises. In addition, the project schedule must provide information on when the teachers or tutors can be consulted and when and where the examinations will be held.

c) *Supporting communication and evaluation (see 7)*

In order to enable the instructional system to operate well, certain provisions must be taken so as to ensure an undisturbed flow of information. Insufficient or incorrect information on the function of a media system have often rendered the system unsuccessful. This communications system should perform the following tasks and functions:

- It should inform the public, the potential participants and other teachers and tutors, whose co-operation is desired, of the purpose and objectives of the project. This should be done several months prior to the start of the project. In this way it is possible to reach a larger audience and to make the teaching staff more willing to co-operate;
- It should stimulate constant consultation and co-ordination between all the parties who must collaborate in the project so as to ensure that it turns out successful — politicians and educational planners, programme producers and technicians and the programme directors of the radio and television stations. In this way it is possible to avoid errors and to prevent that the same work is being done twice;
- It serves to form a continuous flow of information between the broadcasting headquarters and the conveyors of knowledge, that is, the teachers and tutors, who have the task of co-ordinating the learning resources and activities in the reception situation. This information refers to notifying the participants of the contents of of a programme and the broadcasting period, and also includes advice and tips as to how they should prepare for the programme and do the follow-up work. Naturally, it is possible to fulfil the same task by means of a detailed written timetable or schedule of the programmes and broadcasting periods, but it must not be overlooked that this additional information repeated at short intervals gives the tutors and teachers the feeling of belonging to a team and not being isolated, which will of course have a positive influence on their work and endeavours. Moreover, periodical visits paid by inspectors from the broadcasting headquarters can be of great help in maintaining the motivation of the teaching staff operating in the reception situation at a high standard. In fact, the questions as to whether the programmes will be effective depends to a great extent on the transformational abilities and the standard of motivation of the teachers and tutors in the reception situation;
- Feedback of data from the learners and teachers in the reception situation to the station; this data being usable for judging the performance and efficiency of the system and for making improvements. In this connection, we refer both to comments made by the teachers and students on the instructional broadcast and on the accompanying material, and data on the motivation, interest, attention and achievements of the students and on the functioning of the technical apparatus. This information should be compiled at the shortest possible intervals and should be as comprehensive as possible. Apart from written reports and statistics, it is very important for the studio teachers and programme writers to attend the reception situation repeatedly, so that they can judge for themselves how successful their programme is. In fact, such visits can often be even more informative than the reports and statistics mentioned before. In addition to all this, working meetings attended by tutors and teachers should be held at various places.

The logistics for the various forms of supporting communications will require careful planning. Some can be done by mail or over the phone, whereas some necessitate, as mentioned, personal visits and periodical seminars.

d) *Training of the pedagogical staff*

Within the framework of a media system, the performance of the persons collaborating in the project is of greater significance for the success of the project. Thus is very important for all the persons and groups concerned with the project to attend specific introduction courses. Especially the teachers and tutors operating in the reception situation or in other joint teaching ventures and on whom the success of the project depends to a great extent must have intensive training.

7. *Implementation of the media system*

Now that the individual lessons have been recorded on video-tape, the accompanying material has been printed and is ready for being mailed out, the technical facilities have been provided for, the staff of technical and pedagogical collaborators have been made acquainted with their tasks, and the potential participants have been addressed to and informed about the project — all the substantial preparatory work has been done and the project can be launched.

8. *Evaluation and modification of the media system*

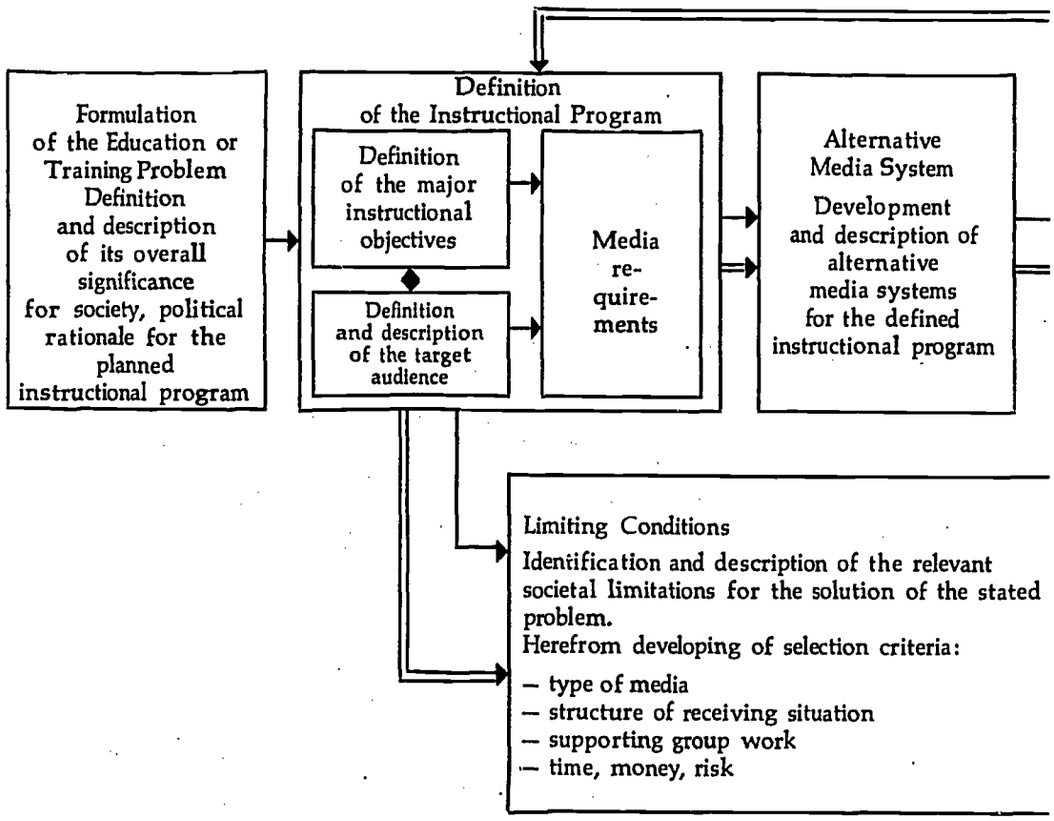
Once the project has been carried out in part or completely, the project achievements must be evaluated in the light of the objectives included in the definition of the instructional programme. The facilities used to compile the data necessary for this purpose form an integral part of the media system (cf. item 6 c)).

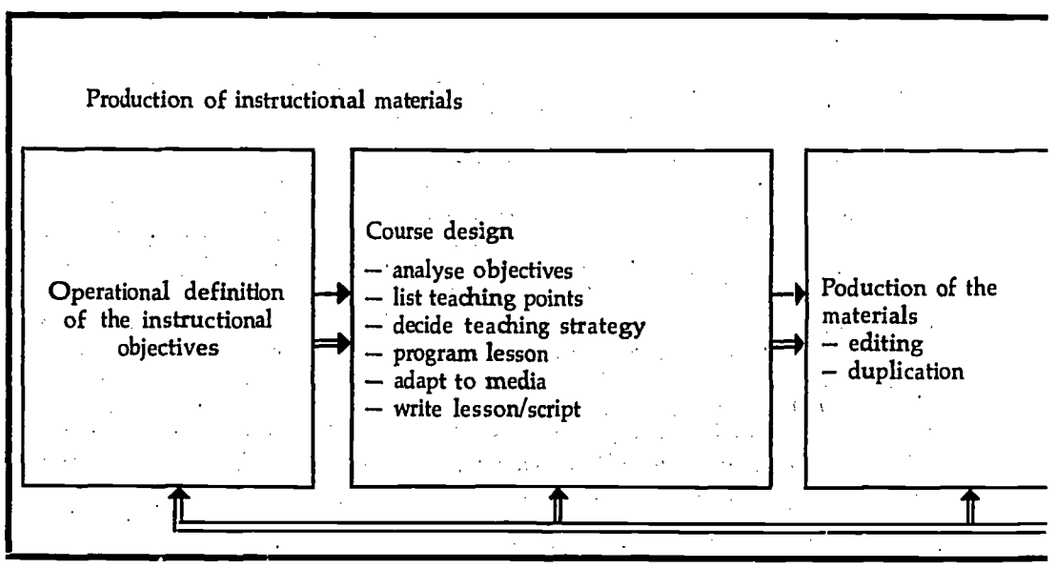
The evaluation work will be carried out on two levels. First, the project achievement in reaching the target audience will be evaluated by comparing the definition of the target audience with the student population, the media system factually serves. Second, the achievement of the project in regard to student learning will be determined by comparing the instructional objectives with student achievement.

The successes and the shortcomings of the media system in terms of instructional objectives and target group are then assessed in quantitative and qualitative form.

In principle, the cycle of the systems approach is now complete, but because it cannot be assumed that the project has reached all the objectives formulated in the definition of the instructional programme, a second cycle must be added. The following measures must be taken in view of the objectives or part-objectives not reached in the course of the initial set of actions: first, the reasons must be analysed for the failure of the media system as regards the target audience and instructional objectives. The basis for the analysis of reasons is constituted by the data compiled in addition to the actual appraisal of the project achievements, such as the reports of the inspectors on the work done by the tutors or teachers, or the written and oral comments and opinions of the students on the programme and material they work with, or a comparison between the distribution of the study centres and the regional origin of the students. Are the reasons for failure found on the basis of this information, then the revisions of the curriculum in respect to method and contents are carried out and necessary changes concerning the distribution and operation of the study centre for the next study period or study cycle are made. Then, in the next run, the revised

Table 3: *Systems Approach and the Development and Planning of Media Systems.*





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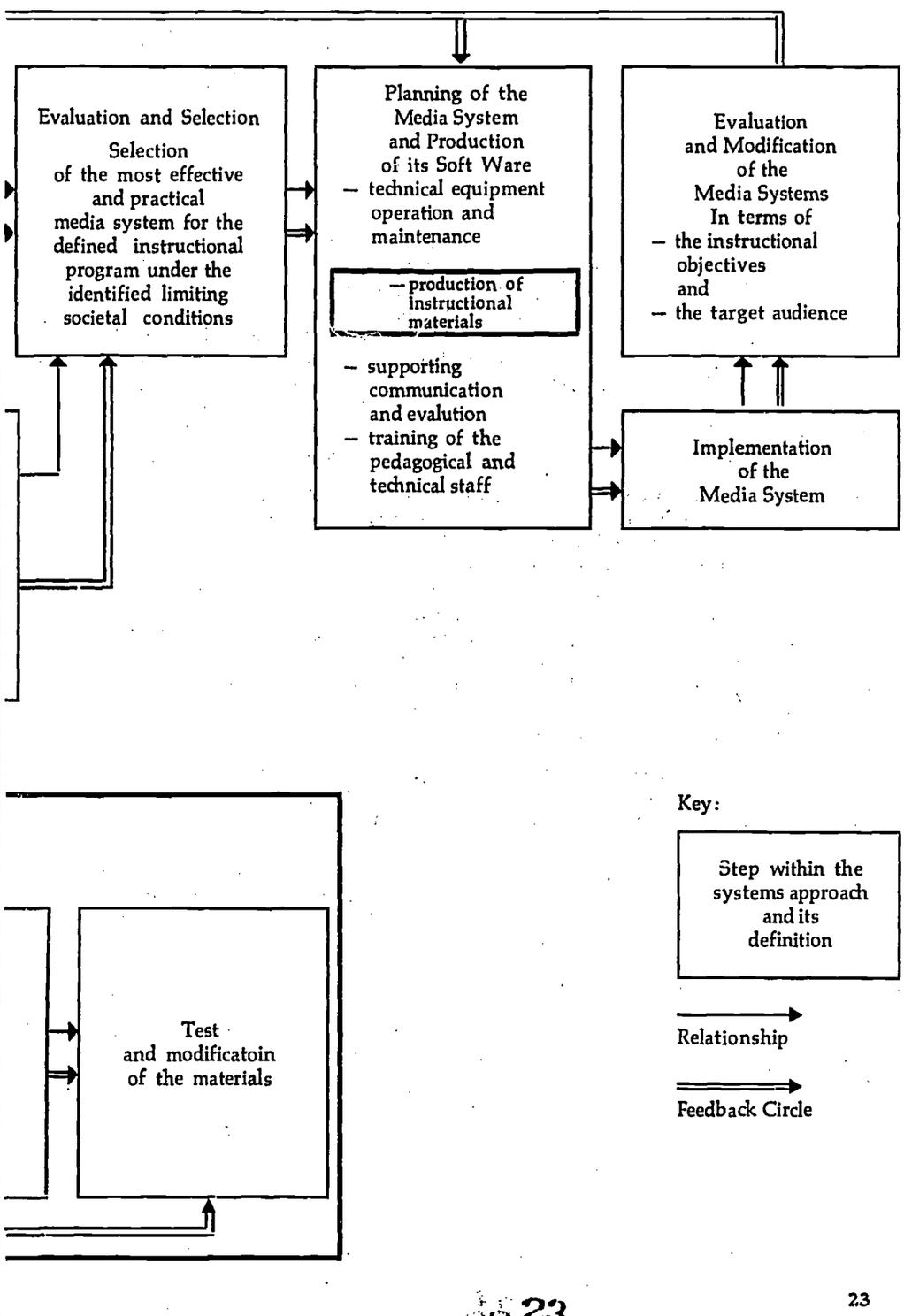
Evaluation and Selection
Selection of the most effective and practical media system for the defined instructional program under the identified limiting societal conditions
Planning of the Media System and Production of its Soft Ware
– technical equipment operation and maintenance
– production of instructional materials
– supporting communication and evalution
– training of the pedagogical and technical staff
Evaluation and Modification of the Media Systems In terms of
– the instructional objectives and
– the target audience
Implementation of the Media System
Test and modificatoin of the materials
Key:
Step within the systems approach and its definition
Relationship
Feedback Circle

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media system is again rated in the light of the stated objectives. This circular procedure should be continued until the objectives of the project are reached to a satisfactory extent, both in terms of student achievement and coverage of the student population. Since the goals themselves are subject to a constant change stimulated by external pressure and alterations of the surrounding society, this repetitive procedure of appraisal and improvement will go hand in hand with the media system as long as the latter remains in existence.

Summary

Now we have formulated the eight steps of systems approach and have indicated a few of the essential aspects and questions arising when media systems are developed, planned and implemented with the help of this problem-solving procedure. Nevertheless, such a descriptive presentation of the procedure only gives an insufficient impression of the systems part that is the dynamic character and self-controlling capacity of this procedure. For this reason, we have summarized the systems approach in Table 3 in a flow diagram. This diagram underlines the continued evaluation of each step taken, the feedback to preceding steps and the consideration of the limiting conditions, which influence the decision procedure at each point. In other words, the diagram stresses the characteristics typical of this problem-solving procedure.

In conclusion, it should be pointed out once again that systems approach is not the answer to a problem, but rather the well-structured scientific method of finding the best answer. The way in which this is done is by no means new. In science, in everyday life, rational people faced with problems always have applied this approach. We often make use of the systems approach without even knowing it, for example, when buying a car, aiming at a new position or when we make vacation plans. That is, we at least should make use of it. If we ignore this rational procedure for finding the correct decisions and make our decisions on an emotional basis or on inadequate alternatives, we will often regret the decision taken and the consequences originating therefrom. Systems approach is used by industry and government in areas where the penalty of a wrong approach is too costly to conceive.

In the strategic area of education and training, society cannot afford any longer to do without this effective and efficient procedure for solving problems, a procedure guaranteeing the best application of the funds and human resources available.

Michael Schmidbauer
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II.

Media Systems in Adult Education

Austria

The Radio Course "Lebendige Wirtschaft"

1. *General Remarks*

In the 1960's the Austrian Association of Adult Education Schools (Volkshochschulen) attempted several times to organize courses in economics. As these attempts were not very successful the secretary general of the Association decided in 1968 to invite various institutions that also showed an interest in running courses in economics and had even started such courses with varying success to take part in a joint campaign. Accordingly, the Chamber for Wage Earners and Salaried Personnel of the Economic Development Institute, the Association of Austrian Industrialists, the Federal Ministry of Education, the Association of Austrian Savings Banks, the Economic Society of Lower Austria and ORF (School Programmes Department) got together to collaborate in this campaign.

1.1 *The subjective and objective need for training in economics*

It soon became clear that there was an objective need for providing training in the field of economics. Whenever significant economic events had occurred in the past few years — such as the devaluation of the pound sterling or the revaluation of the deutschmark, price and wage increases, forecasts on the growth of the economy or other outstanding factors influencing the economic situation — observation of the population's economic behaviour and opinions and comments on the events involved revealed how very little people knew about economics in our modern world. This insufficient knowledge on the part of the population makes it much more difficult for banks, the president of the national bank, and politicians to take rational decisions of national economic importance. The facilities provided hitherto for teaching economics do not appear to have generally increased the population's knowledge in this field.

It also became obvious that teachers had a similar objective need for training in economics. Although this subject had been included in the school syllabus following the reform of the teaching system in 1962, the teachers giving lessons in economics had so far received instruction in this field only very sporadically.

The fact that there was a definite objective need did not necessarily imply that enough people would feel a subjective need for improving their knowledge in economics. It did however appear that a sufficient number of persons would be interested, and this was substantiated by various factors: The Austrian Economic Society had organized several courses for teachers every year, and these courses had invariably been attended by a great many participants although they had been run during the holidays and the teachers taking part had to pay an enrolment fee. Banks noticed the same high degree of interest in the courses they organized, and

adult education institutes always had full classes whenever the lecturer in a course was a well-know expert in economics. Thus, it was justified to assume that the numerous articles published by the press, the ORF programmes on economic topics and the new syllabus had created a general atmosphere making a relatively large number of men and women willing to try hard in studying certain economic subject matters and unwilling to accept the stereotyped knowledge most people have in this field.

1.2 *The reasons for the media compound*

The situation described in the foregoing gave rise to the decision to carry out an experiment with a radio college in economics, to be conducted within a media compound consisting of the following elements: The radio programmes, the accompanying material in the form of books or scripts, and group meetings held at regular intervals of four weeks. In addition, it was intended to organize a final examination.

ORF was prepared to carry out the experiment as it could be assumed that the course would reach a relatively large number of listeners, although it was naturally a minority programme. This assumption was supported by the results of a sociological study conducted by Paul Lazarsfeld, who proved that although radio is not able to convey new attitudes or new knowledge unless a way has been paved herefore by society or a corresponding feeling among the population, it is able to intensify and promote knowledge if conditions are suitable, and this seemed to be the case both in objective and subjective terms.

Written accompanying material was necessary, as experience showed that adult education courses are very easily regarded as a pleasant influx of information, but not as a genuine learning procedure. It was evident that real success could only be hoped for if written study material were offered in addition to the radio programmes in the form of scripts and books, and if the students were constanly required to use this material. Nobody could expect the students to have such a marvelous memory that they could retain what they had heard only once, or that they could concentrate so effectively that they would listen with utmost attention to a half-hour radio lesson, even if this lesson were interrupted by "relaxation breaks".

The group meetings also belong to the media compound and – speaking in theoretical terms – constitute the necessary social phase in the teaching programme.

1.3 *The final examination*

The examination was not intended as a genuine element of the media compound, but rather as a kind of final step. Its purpose was to provide additional motivation to prospective students for taking part in the course. In our society somebody who has passed an examination with a good mark is considered to have a good knowledge of the subject concerned. Whenever a listener decides to enrol in the course for reasons of professional advancement, the examination certificate serves to prove his qualifications in the subject to his superiors, such as school administration boards or staff managers. Other students may in turn regard the examination as a confirmation of their own achievements and accordingly their self-confidence increases. Over and above this may be assumed that the very existence of such an examination gave prestige to the course, in this way recruiting an additional group of students who took part in the work but possibly did not even sit for the exam at the end.

1.4 *The organizational structure*

The course was run under the name "Lebendige Wirtschaft" ("The Living Economy") taken from the textbook of the same name by Kutschera-Nitsche, which was also used within the media compound.

In view of the objective of the course to reduce stereotyped thinking in economic matters, Professor Horst Knapp was requested to compile the radio script. Professor Knapp is well known in Austria as a brilliant journalist and an impartial economic expert, and he could be expected to accept other opinions and viewpoints even in the case of disputable economic issues on which he had his own personal ideas.

The series was made up of 32 programmes, nos. 12 and 24 serving the purpose of recapitulation.

Two books were used as study material: "Wirtschaftsfibel" ("A Guide to Economics") by Horst Knapp and "Lebendige Wirtschaft" by Kutschera-Nitsche, which has already been mentioned above and has been acknowledged by the Federal Ministry of Education.

The "Wirtschaftsfibel" by Horst Knapp was chosen for the course because the individual sections of the book corresponded roughly to the radio script, thus making this publication suitable for repetition and revision purposes. The book written by Kutschera-Nitsche was used as a study basis because — being acknowledged by the Ministry of Education — it contains the subject matter taught in grades 7 and 8 of general secondary school. And it was this subject matter that was required in the examination. Scripts were then compiled in addition to the textbooks. They were made up of three parts: A short summary of each programme, an explanation of the economic terms and material with references to the textbooks, and questions intended for self-testing (with the answers included). The purpose of the questions was to enable achievement-oriented listeners to measure their achievements with the help of the marks they had grown accustomed to at school, and to show students who did not work very hard where they should concentrate a bit more.

The summaries of the programmes were written by the script author. The explanations and references were compiled by another economic expert, and the self-testing questions were drawn up by an assistant working at the Teacher's Training Institute of Vienna University. The group meetings were organized by various adult education institutes and by companies within their own individual regions. ORF assumed the expenses for the script and the production of the radio programmes, and also paid for the enrolment procedure and the costs arising for organizing the students' work. The Association of Austrian Saving Banks paid for the compilation and printing of the scripts, and also remunerated the teachers working at the group meetings, which were organized by adult education institutes. The Federal Ministry of Education published an examination schedule, had the questions prepared for the examinations, organized the exams, and issued the diplomas. The listeners paid for the books and also had to pay a small fee for the scripts.

1.5 *The advertising and promotion work*

A lot of advertising was done for the course on radio and television. In addition, various adult education institutes carried out advertising campaigns and prospectuses were made available at a great many savings banks. The Austrian Economic

Society requested its members to organize company courses, which was in fact done by a considerable number of companies. The Federal Ministry of Education instructed the state school authorities to inform teachers of the course and to encourage them to enrol therein for receiving further training in the field of economics.

1.6 *The accompanying research*

By carrying out the accompanying research, an attempt was made at examining at least some of the theoretical considerations so as to verify their justification.

Four sources of material were available for research purposes: Information on personal data based on the enrolment cards, 2,030 filled-in questionnaires and 536 questionnaires filled in by examinees, and 14 reports on group meetings including discussions with the teachers and the students.

2. *A Description of the Students*

The total number of enrolments was 8,000. The composition of the student body clearly reflected the success of the advertising done: The courses run by companies were backed up by staff managers or members of the works council, teachers had been encouraged to enrol by school administration offices and school children by their teachers who considered the subject to be an important one. For many people an additional motivation for enrolling was the possibility of getting a positive remark in their personnel sheet. Perseverance of the students and the rate of attendance was certainly increased by the fact that they did not want to make a bad impression by being absent too often. This applied especially in the case of company courses. The material available does of course not make it possible to say in how far these factors — which must be regarded separately of the desire for more knowledge — were the decisive motivation (and if so, in how many cases) for participating. But it may definitely be claimed that these advertising impulses played a significant part, as is shown by the composition of the student body.

2.1 *The social data*

Austria is made up of nine states. The state with the largest number of enrolments was Lower Austria. We are aware of the fact that it was in this state that the most companies encouraged their employees to enrol in the course. In Burgenland 60 % of the students were teachers. Here, the state school board had taken special efforts to promote the course.

All in all only 14 % of the students were female. (Economics is still not considered a subject that should be included in a woman's education.) In Burgenland the percentage of female students was somewhat higher, a considerable number of these women being teachers. The female participation rate was also above average in Salzburg, and it is again interesting to note that in this state the adult education school ("Volkshochschule") had advertised for the course more intensively than elsewhere and that there has always been a large percentage of women in "Volkshochschul"-classes.

Eight-tenths of the students were employed or self-supporting. Of those who did not have a profession, housewives, old-age pensioners, and school children from upper secondary school classes or similar schools formed the principal group. One-

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quarter of the employed persons were teachers, and almost 50 % of the other three-quarters had jobs at medium executive levels, while 4 % belonged to the upper executive level.

Half of the students were in the 30—50 age group, whereas one-eighth of them were more than 50 years of age. 50 % had taken the "Maturität" exam (secondary school leaving examination), while the others had attended vocational training school for 2—3 years after having left elementary school.

2.2 *The students' motives*

More than half of the students having passed the "Maturität" exam and somewhat less than half of those with a lower level of education were of the opinion that they had good or fair knowledge of economics, which they wanted to perfect. A relatively large number of the students in this group had acquired their knowledge by attending courses in this subject, so that it was obvious for them to enrol in a further course.

40 % stated that they needed a knowledge of economics in their professions, this being an important reason for enrolling. This applied above all to students with high-level positions. The other 60 % took part in the course in order to improve their general knowledge as voters and citizens of Austria.

3. *Listening Frequency*

It is claimed in hypotheses that the advantage of the media compound is the fact that the learning material is conveyed to the students through three channels, in this way enabling the students to retain the material more efficiently. Naturally, this theory is based on the assumption that the students use the three media elements equally.

The listening frequency is regarded as the most important element of the media compound. After all, the accompanying material must be geared to the radio script (and not vice versa) and — by definition — the group meetings have the purpose of intensifying and clarifying what the student has already heard on the radio.

However, it became clear as early as February that 4 out of 10 students listened to the programmes only irregularly or not at all (this applies to male and female students alike), and that 1 out of 3 students who took the examination later did not listen to the programmes either. The most regular listeners were the housewives and old-age pensioners who had enrolled in the course. Young people still attending school did not switch on their radios very often, possibly because most of them are used to having the material presented in a "digestible" way. The young employees, on the other hand, who took part in company study groups and listened to the programmes together, proved to be regular listeners. There is doubtless a certain connection between a student's existing knowledge and his listening frequency. Only a few of the students who already knew quite a lot about the subject listened to the programmes regularly.

The fact that a large number of those students who considered the course to be difficult only listened to a few programmes was not surprising. We were not able to determine whether they found the course difficult because they listened to the programmes irregularly or whether — vice versa — it was the difficulties they encountered in the course that resulted in a decrease of their listening frequency. When asked why they listened to the programmes either irregularly or not at all, only very few students said it was because they did not like the course.

The reason for irregular listening stated by ¾ of the relevant group of students was that they had "other work to do or were not at home". The students who attended the group meetings gave very similar reasons for their bad listening frequency, and also raised an additional problem of principal significance: "If you stop paying attention to the programmes just for a very short time it's almost impossible to follow the speaker. You can't relax and sit back for a minute when you're listening to the radio programmes." Some of the students who took part in the group meetings also said: "The teachers at the meetings explain the important things better."

These comments show that it is not possible every week to renew the students' motivations for enrolling in the course and that other factors must be added to make them listen to the programmes regularly.

4. *The Study Material*

Of the 6,400 students who enrolled on their own, 5,069 — i. e. 80 % — ordered the scripts. The total number of scripts sold was about 1,000 more than this, as cooperative societies, companies, banks, and the army also ordered large numbers. The scripts were not expensive — they cost 25.— Austrian shillings for all the 32 programmes together.

The number of books ordered was far lower: 1,779 of the students — i. e. 28 % — were prepared to pay 69. — Austrian shillings for the "Wirtschaftsfibel" 58. — Austrian shillings for "Lebendige Wirtschaft".

The number of books ordered varied from one town or state to the next. For example, 84 % of the students in Burgenland ordered the books, whereas this was done by only 11 % of the students in Salzburg. Incidentally, we heard that the organizer of the course in Salzburg had been rather irritated by the publishers of the books, who had started their own advertising campaign.

4.1 *The scripts*

Orders for the scripts were received from all of the towns where students had enrolled, and there were scarcely any deviations in the subscription percentage (80 % of the students ordered the scripts).

When asked whether the scripts had made it easier for them to understand the subject matter presented, 75 % of the students answered in the affirmative. Male and female students both young and old agreed in this respect. Listeners who had already had a good knowledge in economics prior to the course did not attach so much importance to this learning aid as the others. The students attending the group meetings also said the scripts were good, but only very few of these students had really used them seriously. Nevertheless, all the students were of the opinion that studying the scripts thoroughly was necessary for making the programmes a complete success. They explained this discrepancy between what they considered necessary and what they actually did by saying: "Unfortunately we haven't got enough time for that kind of work."

Other comments made by students in this respect, such as: "I'm not used to learning anymore" — "Learning like that doesn't fit into my daily schedule", are probably more realistic and truthful.

The students who sat for the final examination were also asked in what way they had used the study material. The answers given showed that 3/4 of the examinees had used the books and the scripts to prepare for this examination, which indicates quite clearly that books are important for studying efficiently and successfully.

4.2 *The self-testing questions*

Like the scripts, the students also regarded the self-testing questions as necessary and important for their work, and these questions were in fact read regularly. In discussions held at the group meetings, the students present also said that they looked at the self-testing questions very often and that they checked questions they could not answer in the scripts, so as to find the correct solution. For many students the self-confidence they gained by giving the correct answer to a self-testing question was a very important factor, as we realized when attending one of the group meetings.

In the Austrian town of Ried the teacher decided to hold an intermediate test. When the test questions were discussed afterwards he sometimes forgot to tell the students how many points were awarded for the respective answers. The students complained immediately and said they wanted to know the number of points for each answer. Then almost all of the students told the group how many points they had reached, which obviously made them feel very satisfied. The student with the highest number of points was able to win a book, this presumably being an additional stimulus.

Quiz-type questions also proved to be very popular and were therefore included in the material accompanying "Lebendige Wirtschaft".

5. *The Group Meetings*

The experience gathered at the group meetings was of special importance to adult education. It was hoped to receive information from these meetings along the following lines: In how far is it correct to assume that group meetings are especially important as the third element in the media compound? (The frequent arguments that group meetings reduce the feeling of "being alone" on the part of the student and that this direct relationship between teachers and students is necessary for emotional reasons were not regarded as wholly acceptable. Similarly, the argument that these group meetings are the students' only possibility of asking questions and getting answers — i. e. of taking an active part in the learning process — was not accepted in full either. It is also claimed that the specific needs of the individual can only be taken into consideration at the group meetings. But if all these assumptions were correct, the group meetings should be very popular and have very high attendance rates and low drop-out rates. This does however not comply with the results of empirical studies carried out abroad, which have in fact indicated just the opposite: The group meetings always appear to be the most problematic element of a media compound.) It was therefore attempted to find out what the reasons are for this discrepancy between theory and practice. Is the subjective motivation for attending a group meeting not sufficient, or are the forces counteracting such attendance especially strong? Which part is played by the teacher at a group meeting and what efforts must he make to maintain the student's original motivation for attending the meetings? What benefits do

the students expect to derive from the group meetings? Which organizational requirements are necessary for ensuring functionability and continuity of such meetings? And last not least, how important is the distance from a student's home to the place where a group meeting is held?

Originally, 90 group meetings were planned for the "Lebendige Wirtschaft" course, 80 of which were actually held. One group meeting was to be held for 4 programmes. It turned out later that this 1:4 ratio was insufficient. We were informed at all the group meetings we attended that a four-weekly interval was too long, and that a group meeting should take place at least every other week, as otherwise there was not enough time to deal with all of the learning material presented. In these discussions it became clear that the subject matter broadcast on the radio had to be repeated by the teachers at the group meetings in a compact form, because a number of students had either failed to listen to the programme or had not read the scripts.

5.1 *The students*

60 % of the students who had enrolled for a group meeting when the course started actually attended the first such meeting. Of these 60 %, about 1/3 to 1/2 stayed in the course, i. e. 12–18 students.

The analysis of the students attending the group meetings as to their social characteristics revealed that attendance of the meetings does not depend on age or sex (once women have become interested in the meetings they attend them just as often as men), neither does it depend on the students' school background (the number of students at the meetings who had taken the "Maturität" exam was the same as the number of students who had not taken this examination). The attendance rate of single and married students also complied with the overall representation of such students in the course. This applied in the same way to the employers and employees who had enrolled in "Lebendige Wirtschaft".

When analysing the student body as to the representation of individual professions, it became clear that an exceptionally high percentage of the people working in trade and industry attended the group meetings. In fact, 40 % of the students with trade or industrial professions enrolled for these meetings. The reason for this was that a number of companies organized the meetings on their own premises.

Persons deciding to give up their old profession and start working in a completely new field — and who therefore showed an interest in the course — did not necessarily attend the group meetings.

Students who had already acquired some knowledge in economics tended to join the meetings more readily. Similarly, students already having attended other adult education courses were also more willing to take part in the meetings.

It soon became obvious that the students who were prepared to attend the group meetings took their studies more seriously than the others.

The listening frequency of the group meeting participants was above average. Those students attending the group meetings who did not listen to the programmes regularly said the reason for this was that "everything is explained more clearly at the meetings".

In addition, the group meeting participants thought they were more successful in their work than the other students did.

The number of group meeting participants who sat for the final examination was again above average.

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5.2 *The group meeting teachers*

The teaching methods applied by the individual teachers were very different. The following method proved to be the most sucessful: The teacher gives a short summary of the subject matter presented in the programmes. The group then listens to the most important parts of the programmes, which have been recorded on tape. Before this is done, the teacher points out the items which are of special importance. After the tape has been played to the group the most significant terms are discussed. In the last quarter of the evening the subject matter the students have learnt so far is dealt with once again in connection with the week's topical events. If the teacher has enough time after the meeting and is able to go and have a glass of wine together with the students this will help greatly in securing the group, which in turn will considerably improve the students' sucess, as the students will do their best to reach the achievement standards set.

It was possible to gather some information on the question why certain students did not attend the group meetings by asking these students outright. 20 % of them said that no group meeting was held near where they lived. However, the interpretation of the word "near" was often very different. There was one group of students, for example, that had to travel 30 miles to attend the meetings. These students came together by car. The comment: "There are no meetings near where I live", was sometimes also made by a student when he would only have had to go by bus for 10 minutes. Only 5 % of the non-participants regarded the group meetings as superfluous, 8 % said they were too tired and did not want to go out in the evenings, and the rest had other commitments.

6. *The Students' Learning Sucess*

In order to judge the students' learning success we applied two factors: The students' self-assessment and the success of those students who sat for the examination.

6.1 *Self-assessment*

Only 2 % of the students said the course had been a failure for them, while 50 % were of the opinion that it had been a partial success. 44 % stated that their expectations had been fulfilled. This assessment of their own success does not depend on the students' age and profession, neither are there any differences between male and female students. School background also had no influence — or only very little influence — on the students' assessment of their learning success. On the other hand, however, prior knowledge in economics did affect the students' self-assessment: The better their knowledge before enrolling in the ORF course, the more superior they considered their additional success. Here again it became evident that the benefit a person is able to derive from a course is greater if this person already had a knowledge of the subject beforehand: The better the prior knowledge, the greater the benefit.

It seemed likely that there was a positive connection between listening frequency and the student's success. Nevertheless, almost 33 % of the students only listened to the programmes very irregularly but still considered the course to be a definite success. This implies that the other two elements in the media compound, the books and scripts on the one hand and the group meetings on the other, provided the principal impulse for learning success. The students who had attended the group meetings said that the course had been a success somewhat more often than the students who had not attended the meetings. This shows once again that

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some students considered attendance of the group meetings to be one of the success factor but this does certainly not apply to all of the students.

The purpose of the course was to provide information in the field of economics, in this way attempting to eliminate stereotyped viewpoints, i. e. opinions not based on realistic subject matter but rather resulting from emotional feelings. Two questions were asked in this context: "Did any of the viewpoints presented in the course appear to be incorrect?" and "Did the course make you change any of your own opinions?"

A considerable number of the students stated that the course had made change their opinion on a certain issue. The following changes in opinion were quoted by the students:

- "I got a new idea of what the economy really looks like";
- "The course made me change quite a few superfical opinions";
- "I used to hate statistics, but now I can judge those things better";
- "There were many things I didn't understand the right way because I didn't know enough";
- "Now I can judge both sides much better";
- "I'm much more tolerant now concerning the difference between employers and employees";
- "The course taught me how to think in terms of economics";
- "I was able to understand that it's not possible to take the entire increase of productivity and demand that wages go up at the same rate."

The higher a student's position in the company he worked at, the less often he changed his opinions. We cannot say whether this was because the author and executive-level students had more views in common or because the students working in executive positions had a better knowledge of the subject before the course started. It must be considered that the listeners who did have a better prior knowledge of economics also tended to change their views often. Only 8 % of the students regarded an explanation given by the author as incorrect.

The following examples illustrate what was considered to be incorrect. Obviously, these judments are due to the fact that the author and some listeners had different opinions on questions of life and the world of today:

- "The course almost makes you think you're living somewhere behind the Iron Curtain";
- "People in the top income brackets don't run top risks";
- "The information was too one-sided. The Eastern system has its advantages too";
- "Wage increases don't necessarily mean that prices must go up";
- "They made modern suggestive advertising appear as if it were harmless";
- "Calculation of prices."

6.2 The final examination

The final examination was organized as planned. By passing a degree, the Ministry of Education made it possible for successful candidates to receive a state diploma. The Ministry was also in charge of the examination sessions.

Different opinions have been voiced on the value of the examination. A positive factor is that the possibility of acquiring a diploma improves the image of the

course. In our world of today, in which an individual is able to gain certain rights and improve his social prestige by taking an examination, it appears quite obvious that the prestige of new teaching methods will be increased by an examination held at the end of a course. And by awarding a diploma to successful "Lebendige Wirtschaft" students we had this possibility of bettering the reputation of the course. In fact, a number of companies promised their employees that examinees having received the diploma would be given preference in the case of promotion, and teachers realized that acquiring the diploma would make a good impression in their staff members' file.

In opposition of these positive factors attributed to the examination it was stated that many people are afraid of sitting for exams and even suffer from a kind of "examination neurosis". Opponents of the examination system said that more people would enrol in the course if there were no examinations. Some data were then compiled to provide an answer to this question:

When enrolling, 23 % of the students (2,554) said they wanted to take an examination. In February — after 18 programmes had been broadcast — 52 % of these students still intended to do so. The final number of examinees was 579, i. e. somewhat less than one-quarter of the initial number of students who had wanted to take the exam when enrolling.

All in all, examination sessions were organized in 35 towns. The number of examinees in these towns ranged from 8 to 69. The number of students who intended to take the exam when enrolling and the number of students who actually took the exam differed from one state to the next. Several factors were of significance in this respect: Students sat for the examination more readily if, for example, they worked for savings banks, the managers of which encouraged their employees to acquire the diploma. The same applied if the members of works councils were able to convince students working for their companies of the significance of the examination. A great many companies in Lower Austria, Tyrol and Vorarlberg had integrated the course in their own training programmes and had allowed students to work shorter hours so that they had more time for studying. In return for this, the companies expected the students to take the examination. It had been promised to teachers that the diploma awarded for passing the exam would be accepted as evidence of their further training. Accordingly, the number of teachers who sat for the examination was above average.

In one state teachers were encouraged to take the examination by the school inspection board, and the number of teachers who initially enrolled for the exam was in fact relatively large. However, as no other stimulus was provided after the enrolment phase and no group meetings were organized, only a few teachers finally sat for the exam.

The instructors at the group meetings were also able to encourage students to take the examination. In Upper Austria, for example, only a few students initially wanted to acquire the diploma, but when the examination was held a relatively large number of students were present.

This was the achievement of an excellent instructor who prepared his students for the examination by holding intermediate tests and giving a special preparatory lesson for the examinees.

Only 5 students failed the examination out of the total number of 579 examinees. 53 students — i. e. 9 % — passed with the grade "fair", while 82 % had average marks.

The examinees' self-assessment gives some indication of what they thought about the exam: After having sat for the examination they had been asked which mark they would give themselves. Of the examinees who passed with a "very good"

mark one-third had expected to be successful. Of those who received a "good" mark 60 % had expected to reach that grade, 21 % had thought they would be better, and 19 % had expected to be worse. Of the examinees who passed with a "satisfactory" mark 35 % had thought they would have this grade, 61 % had expected to be better, and 4 % had expected to be worse. Of those who passed with a "fair" mark 12 % had expected to have this grade while all the others had expected to be better. In fact, 5 % of the examinees in this last group had thought they would be able to manage a "very good" pass.

7. *Summary*

This attempt at running an instruction course on radio and within a media compound – which was the first such attempt ever made in Austria – was considered so interesting by approximately 3,000 Austrians that they decided to spend the money required and buy the accompanying material (books or scripts).

Among those students who had a profession there was a considerable number of "superiors" (i. e. employees giving orders to others) in various positions. These students wanted their staff to acquire a higher standard of knowledge in economics and thus took this opportunity of showing their staff how important they considered this subject to be.

In the eyes of these students in superior positions the examination held at the end of the course was of special significance. They did not only regard it as a criterion for confirming an individual's success in his studies, but also as evidence that each student really took the course seriously.

At the end of the course approximately 9 % of the interested persons took the examination. It will not be possible to say whether this figure is satisfactory until future courses provide material for comparison.

When trying to judge the merits of the course, it must be considered that in the past few years economics was referred to as an important subject by numerous persons and institutions, which naturally created a positive atmosphere for the course among the population and made people willing to accept it.

Speaking in general terms it may certainly be claimed that "opinion leaders" also play an important part in instruction courses run within a media compound. This applies especially if such opinion leaders have a possibility of organizing student groups, etc. and if they have a certain position in the vertical hierarchy of the professional world. In other words it might be said that instruction courses run within a media compound will be all the more successful if it is possible to arouse the interest of the opinion leaders of potential target groups by means of advertising and promotion directed at these individuals. The more interested the opinions leaders are, the more successful the courses will be. This interest can then be supported by appropriate organizational measures.

The well-known fact that a person's interest in a certain item will be increased the more he knows about this item has thus been confirmed yet another time. It has also been confirmed that it is easier to arouse an interest in persons with a formal school background – in this case students who had taken the "Maturität" examination. One might mention here that although half of the students had not taken this school examination, they still had a school background higher than conveyed by elementary school alone. These factors comply with the findings made by Dr. Kutalek in his study of the persons attending the courses run by the "Volkhochschule" (adult education school with night classes) in Vienna. There can be no doubt that there are very many persons in these courses who are ready and willing to improve their level of education.

In our society economics is still regarded as a "men's subject", and the percentage of female students was relatively low.

It is very interesting to note — although we do not have definite figures to confirm this — that the three elements in the media compound were obviously not used as a whole but rather in an alternative manner. The alleged difficulties the students had in listening to the programmes regularly resulted from the fact that the importance of these programmes was underrated. It should be considered which ways and means there are of changing this attitude.

Scripts including questions for self-testing (with answers) maintain the student's interest in the course and in many cases even induce them to concentrate on the subject more closely. Regular study of the scripts and the books is prevented by a frequent lack of readiness to do tiring mental work.

The only possibility of measuring a decrease in the students' interest in the course was provided by the group meetings, where the instructor was able to observe the drop-out rate. Obviously, no check of this kind was possible in the other two elements of the media compound. The number of students who enrolled for the group meetings was dependent on the geographical conditions, the organizational possibilities of the opinion leaders and of the adult education institutes concerned, the drop-out rate, and the ability of the group instructor.

It was soon noticed that a part of each group meeting must be used for repeating the subject matter broadcast on the radio and that accordingly there should not be too big a gap between the individual group meetings: Discussing more than two programmes at one meeting is impossible. The theoretical concept that the students are able to ask questions at the group meetings so that the instructor can explain things they did not understand in the radio programmes turned out to be unrealistic. In subjects like economics where the student must be able to grasp a certain context and not just one isolated item, beginners are simply not able to ask questions in an appropriate way. This may possibly be different in courses conveying purely factual knowledge.

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Federal Republic of Germany **The Telekolleg**

General Remarks

The first TELEKOLLEG programmes were broadcast by the Studienprogramm of Bayerischer Rundfunk on January 2, 1967. TELEKOLLEG is a compound instruction system combining television programmes, written accompanying material, and group teaching sessions. The aim of TELEKOLLEG is to prepare participants for the so-called "Fachschulreife" examination, which corresponds roughly to GCE O-Levels in Great Britain but is intended for persons already having a profession. Anybody having attended elementary school up to the final grade is eligible to take part in the TELEKOLLEG.

"Fachschulreife" or "Mittlere Reife" qualify a person to attend a college for scientific, pedagogic, artistic, economic or domestic professions, etc. In addition, persons having acquired this level of education are able to attend institutes for training teachers for elementary schools, secondary schools and vocational training schools. Last but not least, "Mittlere Reife" is required for entering a so-called "Fachoberschule" (college) which leads to the "Fachoberschulreife" (college degree at a university level in engineering, economics, social affairs and artistic design) and for attending "Berufsoberschulen" (vocational training schools at a higher level) and colleges leading to a higher level of education equivalent to GCE A-Levels in Great Britain (engineering, economics, domestic science, social welfare).

The fact that television was to be added to the existing educational system offered considerable advantages as compared with the conventional facilities for further education. The initiators of TELEKOLLEG wanted to provide better possibilities of education to those people who so far had been unable to attend secondary schools. Thanks to its broadcasting capacity, television can reach all those parts of the country that do not have enough secondary schools.

In Bavaria, approximately 50% of the population (4.7 million of 10 million people) live in communities with less than 5,000 inhabitants, 21% live in villages with less than 1,000 inhabitants, and only 20% live in cities. This population structure constitutes a good starting point for educational television in general, and especially for TELEKOLLEG.

Moreover, television is characterized by its ability to do its own advertising for the educational facilities it propagates.

The situation was also favourable from an economic point of view. The breakdown of responsibilities between the Free State of Bavaria and Bayerischer Rundfunk ensured a good financial standing for TELEKOLLEG.

TELEKOLLEG is based on a state contract between the Free State of Bavaria and Bayerischer Rundfunk. A contract of this type is necessary, as the broadcasting stations in the Federal Republic of Germany are not subject to state influence or interference and are not obliged to assume duties otherwise performed by the state. If state certificates are to be given to persons using educational facilities provided by a broadcasting organization, a legal agreement must first be laid down in this connection.

The TELEKOLLEG contract is the first contract of its kind in the Federal Republic of Germany.

The Organizational Structure

Bayerischer Rundfunk has the task of conveying to the participants the entire syllabus of the German "Berufsaufbauschule" by means of the methodical and didactic facilities at its disposal. The programmes are produced and broadcast by Bayerischer Rundfunk, which also prints the written material needed for intensifying the programmes and mails this material to the students.

The Free State of Bavaria offers the help of the "Berufsaufbauschulen" and other suitable institutions. The State fulfils the necessary school and organizational requirements, such as paying the teachers, making the classrooms available for the groups, organizing group work on the so-called "Kolleg" days, and providing general pedagogic assistance to the TELEKOLLEG participants. In addition, the correction and evaluation of the written work submitted by the participants is likewise done by the State, which also makes sure that the necessary examinations are held in accordance with the regulations laid down by the Bavarian Ministry of Education and Culture.

The decision to take the "Berufsaufbauschule" as the basic model for TELEKOLLEG was made after a number of studies had been conducted on the need for advancement of the sectors of the population to be approached and on their readiness to improve their education, and following further studies on the obvious shortage of persons with medium-level qualifications in industry, commerce, and administration. These studies were supplemented by empirical surveys on the socio-educational localities of various types of schools and on the nature and character of the existing types of schools as regards their flexibility towards new types of education and training, especially in connection with teaching by television. Additional empirical surveys were aimed at finding out the learning habits of people taking part in remote study courses and those of persons taking the so-called "Zweiter Bildungsweg" (the "second education channel"), which provides access for employed persons to secondary schools other than the regular "Mittelschule" (secondary school leading to a GCE O-Level equivalent) and "Gymnasium" (secondary school leading to a GCE A-Level equivalent = grammar school in Great Britain).

The results of the preparatory work and studies showed that it would be most convenient to apply the "Berufsaufbauschule" as the model for the TELEKOLLEG project. A "Berufsaufbauschule" can be attended by anybody who has completed elementary school and is at present receiving vocational training. Normally, the students are from 15 to 25 years of age. They attend the school for two years in evening classes, and then have full-time classes for one year. After three years they take an examination to acquire "Fachschulreife".

In TELEKOLLEG, the participants sit for the "Fachschulreife" examination after about two and a half years, and do not have to interrupt their professions in any way. There is no maximum age limit for participants.

TELEKOLLEG is broadcast in Bavaria on Channel Three, the so-called "Studienprogramm". One 30-minute television programme is broadcast every evening and is repeated at a later date. The output rate in each main subject is one new lesson a week. When TELEKOLLEG was started the programmes were also transmitted on Channel One. However, as broadcasting times have constantly decreased from one course to the next, course No. IV can be received on Channel Three only.

It was not decided to break TELEKOLLEG down into groups with varying modes of participation until the beginning of the second course. This categorization resulted from the different objectives the individual participants had. The principal group is category A, which corresponds to the original concept of the TELEKOLLEG planners, i.e. it continues up to the "Fachschulreife" standard. TELEKOLLEG categories B and C do not allow the participant to attain "Fachschulreife".

Persons enrolling in category B only take selected subjects. The existing adult education institutes run special courses in which the contents of the programmes are discussed and intensified. In Bavaria, 25 "Volkshochschulen" (adult education schools with

night classes) organized a total of 58 courses for TELEKOLLEG. The English language course is the most popular one.

Persons taking part in category C only receive the accompanying material, for which they pay a somewhat higher fee than the other participants. No further steps have been taken to organize this group in any other way.

The ratio of participants in categories A and C is approximately 2:3 in favour of category C, i.e. there are more people in the less formal group. Very many viewers in Bavaria take part in TELEKOLLEG on a completely informal basis by watching the programmes more or less regularly, but without enrolling or registering in any way. When the programmes were still broadcast on Channel One at 6 p.m. an average number of 160,000 sets were switched on every evening. The lessons in physics and history proved to be the most popular.

The Programmes

In terms of the programmes broadcast, TELEKOLLEG is made up in the following way:

German language		78 lessons
English language		78 lessons
Mathematics		78 lessons
Practical mathematics		13 lessons
History	52	
Economic geography	13	78 lessons
Sociology	13	
Physics	65	78 lessons
Chemistry	13	
Biology		13 lessons
Economics and business administration		13 lessons

In addition, there are the special subjects relating to certain professions, which TELEKOLLEG participants can choose according to their professional objectives:

Technical drawing	26 lessons
Technical chemistry	5 lessons
Accounting	8 lessons

The participants may also enrol for electrical engineering (13 lessons) and Bavarian history (6 lessons). Both of these subjects are voluntary. All in all, the TELEKOLLEG curriculum is made up of 487 lessons.

The following chart shows the breakdown of these lessons in Course No. IV:

First term Jan.–April 71	Second term April–July 71		Third term Sept.–Dec. 71	Exam. term 1 Jan.–April 72
German L 1–13	German L 14–26	S u m m e r h o l i d a y s	German L 27–39	Programmes re-broadcast and exercise programmes for intermediate examination
English L 1–13	English L 14–26		English L 27–39	
History L 1–13	History L 14–26		History L 27–39	
Maths L 1–13	Maths L 14–26		Maths L 27–39	
Physics L 1–13	Physics L 14–26		Physics L 27–39	
Biology L 1–13	Technical drawing I L 1–13		Technical drawing II L 14–26	Bavarian history L 1–6

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Fourth term April–July 72	Fifth term Sept.–Dec. 72		Sixth term Jan.–April 73	Exam. term 2 April–July 73
German L 40–52	German L 53–65	S u m m e r h o l i d a y s	German L 66–78	Programmes re-broadcast and exercise programmes for main examination
English L 40–52	English L 53–65		English L 66–78	
History L 40–52	Chemistry L 1–13		Techn. chemistry L 1– 5	
Maths L 40–52	Maths L 53–65		Accounting L 1– 8 Maths L 66–78	
Physics L 40–52	Physics L 53–65		Practical maths L 1–13	
Sociology L 1–13	Economic geography L 1–13		Economics and business admin. L 1–13	Electrical engineering L 1–13

Prior to the first transmission in January 1967 sample programmes were taken from the main courses and checked as to their qualities. 140 pupils from "Berufsaufbauschulen" met at the premises of Bayerischer Rundfunk from June 27 to July 12, 1966 and watched the programmes. Afterwards they were tested to see how good their knowledge was of the material presented therein. The results were quite satisfactory.

The programmes were produced in the Bayerischer Rundfunk studios in Unterföhring near Munich. Most of them are in black and white. They were shot with the help of automatic cameras and recorded on video tape. Normally three cameras were used, and each 30-minute programme took an average of one day to produce.

In TELEKOLLEG individual teams are in charge of the various subjects. The director of the entire project was a psychologist with special knowledge in the field of education. He was assisted by an expert for the scientific subjects and an expert for the humanity subjects. The instructors were mostly teachers who had passed the state examination and had a certain amount of practical teaching experience.

The Accompanying Material

The accompanying material is sent to each participant for each term in advance. The material for the entire course consists of about 5,000 pages.

In the English language course records are also used. The accompanying material is made up of worksheets presenting a clear and understandable summary of the contents conveyed in the individual lessons. It also includes so-called "Lektionspässe", i.e. printed sheets with gaps to be filled in by the participants during the television lessons. In addition, there are preparatory drills for the following programmes and a number of exercise and self-testing sheets. Certain programmes are also accompanied by examination sheets which are filled in by the students taking part in category A and submitted for correcting.

As from course No. III onwards the accompanying material is placed at the participants' disposal in the form of books. This is necessary if the State is to assume the costs for the accompanying material in future.

At present, the only expenses the participants have to pay are for the material accompanying the courses. The 34 books cost 6 times DM 24.–, i.e. a total of DM 144.–. The material used in the vocational subjects must also be paid for by the participants.

The "Kollegtag"

The Ministry of Education and Culture is also in charge of the so-called "Kollegtage" ("college days"), and must ensure that they take place as planned. The "Kollegtag" is held every two to three weeks at a school which can be reached conveniently by all the TELEKOLLEG participants living in a certain area. When TELEKOLLEG was started, there were 120 locations where a total of 286 working groups got together for the "Kollegtage". At present (end of 1971) there are 60 locations and 95 groups. At the schools where the "Kollegtage" are held the TELEKOLLEG participants meet in groups of 10—15 persons for five hours on Saturday mornings.

The purpose of the "Kollegtag" is to provide answers to questions having arisen in the last three programmes and to intensify the knowledge acquired by the participants. Another aim is to counteract possible negative consequences caused by the television lessons. These gatherings help to avoid a feeling of being isolated and "all alone" on the part of the participants, and prevent them from retaining material they have understood wrongly. In addition, the participants are able to ask the television teachers and the instruction staff questions by telephone on certain days. These questions are then answered direct on the screen.

Within the framework of the TELEKOLLEG system it is considered absolutely essential for the participants to attend the "Kollegtage". In fact, attendance of these meetings is obligatory.

It should be mentioned in this connection that the "Kollegtage" are the only possibility of determining the current number of people taking part in category A of TELEKOLLEG.

The group lessons are supervised by teachers specializing in the various subjects who work in the towns where the "Kollegtage" are held. In most cases these teachers are from "Berufsschulen" (vocational training schools). They also have to correct, mark and discuss the exercises and examination papers submitted by the candidates, as well as the 27 short exams held in the courses. The annual grade of each participant, which is calculated on the basis of the marks he receives in the exams, is valid at a factor of 33⅓% in the intermediate and final reports. In TELEKOLLEG there are two intermediate examinations and one final examination, i.e. the "Fachschulreifeprüfung".

The Final Examination

The standards applied in the "Fachschulreifeprüfung" are based on the teaching aims and examination requirements of "Berufsaufbauschulen". In the case of mathematics, the theory of sets and affine geometry were added to the normal curriculum, and additional methods were also applied in chemistry that have not been used so far at regular schools. The final examinations were held on the premises of "Berufsaufbauschulen" along the lines of a uniform exam schedule and with standardized papers and marking and evaluation procedures. They were supervised by the headmasters of the respective "Berufsaufbauschulen".

The first and only final examination so far was held in November 1969 for courses Nos. I and II. 96.5% of the 2,983 candidates passed. By comparison, a total of 1,951 pupils at 90 Bavarian "Berufsaufbauschulen" attained the "Fachschulreife" in the 1968 school year.

With the exception of English and mathematics (average grades 3.23 and 3.14 respectively) the average grades achieved by the TELEKOLLEG participants in the final examination were all better than 3.00 which compares very favourably with the results of the regular "Berufsaufbauschulen". (26% of the 11,044 participants who had originally enrolled for TELEKOLLEG passed the final examination.)

The Cost of TELEKOLLEG

In 1967 and 1968 a sum of DM 2,344,000 was spent from the funds made available by the Free State of Bavaria. The estimated amount spent in 1969 was DM 1,400,000, so that the overall expenditure for all of the courses should total approximately DM 3,744,000. If this sum is converted in terms of the number of participants who passed the final examination (2,878), the costs per capita and per annum are DM 434. By comparison, the Free State of Bavaria spends DM 1,070 a year for one elementary school pupil, DM 2,240 a year for one secondary school pupil, and DM 2,280 a year for one grammar school pupil.

During the same period, Bayerischer Rundfunk spent a sum of DM 14,000,000 on the TELEKOLLEG productions, on the compilation and distribution of the accompanying material, for staff and administration, and for carrying out the accompanying research projects. This figure does not include the transmission costs.

The Volkswagen Foundation supported TELEKOLLEG with an initial donation of DM 3,000,000. This money was intended to be spent only on projects aimed at providing the theoretical and didactical fundamentals for TELEKOLLEG, and on the accompanying research.

In the meantime, the investments made by Bayerischer Rundfunk have started to pay off in financial terms as well. Other broadcasting organizations in the Federal Republic of Germany consider the overall concept and the results of TELEKOLLEG to be so successful that they are purchasing the programmes for their own purposes. TELEKOLLEG is to be taken over either completely or in part by the German federal states of Baden-Württemberg, Rhineland-Palatinate, Saarland, Hessen and North-Rhine-Westfalia.

But TELEKOLLEG has also met with interest outside of the Federal Republic: Switzerland has taken over the entire programme with the exception of the lessons on Bavarian history.

The royalties received by Bayerischer Rundfunk for the programmes have not been taken into consideration in the overall cost calculations.

The Accompanying Research

Empirical research projects aimed at providing the answers to a number of questions linked with the usage of television as an educational medium have been—and are being — carried out parallel to the courses.

In the following we should like to report on the most significant results of the research projects accompanying TELEKOLLEG. (It might be pointed out in this context that there is a series of publications issued by the Studienprogramm of Bayerischer Rundfunk, which provide information on the results of the research work and on the experience made.) The present report deals especially with the persons taking part in category A of TELEKOLLEG and with the problems connected with these participants. In introducing the individual research projects we have chosen a general form of presentation. A headline indicates roughly the field concerned. Next, the research object and the hypotheses connected therewith are formulated, and finally the method is described in brief and the results are discussed.

Extent of Information on TELEKOLLEG

The research project was carried out by the Wissenschaftliches Institut für Jugend- und Bildungsfragen in Film und Fernsehen (Research Institute for Questions of Youth and Education in Film and Television), Munich: Extent of information on TELEKOLLEG, August 1967.

Authors:	M. Keilhacker, W. R. Salzmann, R. Kerler, J. Lukatsch, K. Ulich.
Number of research project:	U59, U60.
Research object:	The public response to TK (TELEKOLLEG).
Hypothesis:	Cognitive dissonance theory, selection process.
Sample:	Munich households (senior persons in family) with telephone and television set; random sample.
Test indicators:	● Do you know who runs TK? ● Do you know the standard you can reach in TK? ● Do you know the individual TK subjects?
Moderator variable:	● Level of education (elementary school, secondary school, Abitur = equivalent of GCE A-Levels in GB) ● Age ● Sex
Method:	Direct interview (informed beforehand: 50% answer rate), telephone (not informed beforehand, 78% answer rate).
Statistic selection sample:	Chi-square, contingency coefficient 5% level.

Results:

The following findings were established among others:

1. There is a connection between age and education on the one hand and extent of information on TK on the other. Senior members of households who are relatively old and have VS (elementary school education) are not informed of TK as well as younger senior household members with MR ("Mittlere Reife" = German equivalent to GCE O-Levels in GB). "If one applies the . . . theory of cognitive dissonance and if it is pre-supposed that VS and MR education are connected with a group of dissonances, MR conveyed by television will become a new dissonance for television viewers with VS education, and a consonant occurrence for television viewers with MR education. However, in accordance with the findings made by Festinger there is a tendency towards reduction of dissonance and concentration of consonance. Speaking in naive terms, that would imply that persons with elementary school education will "avoid" TELEKOLLEG due to the reduction of dissonance and will also "avoid" information relating to TELEKOLLEG, whereas viewers with MR education will feel a closer relationship towards TELEKOLLEG due to a concentration of consonance."

2. If one compares the informedness indicators with each other, it becomes clear that there is a positive correlation between knowing the organizer of TK and knowing the standard of education TK leads to.

   The data compiled gives reason to believe that there are two levels of informedness. The first level is knowing the organizer and the TK education standard. The second level is acquiring information about individual TK subjects. This is done in some cases by the persons concerned watching the programmes. This bi-level procedure is also noticeable in the sub-samples taken in the research project.

The Sociological Facts and Circumstances

So far, three TELEKOLLEG "generations" have taken part in the courses broadcast. Two courses were finished in November 1969 when the final examination was held. Course No. III was completed in autumn 1971, and course No. IV commenced in January 1971.

Chart 1 shows the number of persons who enrolled in the individual courses.

	Course I	Course II cat. A	Course II cat. B	Course II cat. C
absolute number	7,448	3,452	1,414	4,631
in %	100.0	36.3	14.9	48.8

	Course III cat. A	Course III cat. B	Course III cat. C
absolute number	2,586	1,262	3,762
in %	34.0	16.6	49.4

Chart 1: The number of participants in the three TELEKOLLEG courses, structured according to the mode of participation.

The further data supplied in this section should be regarded as statistically proven on a 1% basis, unless other standards are expressly quoted.

First, we attempted to determine the population groups showing an active interest in TELEKOLLEG. In how far would the target groups working in agriculture and manual professions respond to TELEKOLLEG? In what way would girls and women exploit this novel education facility?

The following charts 2–5 indicate that most of the TELEKOLLEG participants do not come from the target groups aimed at.

Size of community	Course I	Course II	Course III
1 – 999	1,261 u	457 u	418 u
1,000 – 4,999	1,576 u	666 u	524 n
5,000 – 9,999	833 o	301 n	251 n
10,000 – 19,999	587 o	282 o	297 o
20,000 – 49,999	459 o	262 o	250 o
50,000 – 99,999	321 u	171 n	121 n
100,000 and more	1,873 o	743 o	496 n

Chart 2: Size of community and number of participants for courses I, II, and III, category A
o = over-represented
n = normal
u = under-represented

Chart 2 shows the relationship between the size of a community and the number of TELEKOLLEG participants. Communities in rural areas with up to 3,000 inhabitants are under-represented to a very considerable degree. Participation in large cities has dropped from one course to the next, while the significance of medium-sized towns with 10,000 to 49,999 inhabitants has increased.

Chart 3 indicates the number of persons who enrolled in courses I and II, broken down according to the seven Bavarian governmental areas, and the percentage of persons employed in agriculture and forestry in these areas.

Area	Course I Difference	Rank	Course II Difference	Rank
Upper Bavaria (incl. Munich)	+ 915	1	+ 262	1
Lower Bavaria	– 94	3	– 52	6
Upper Palatinate	– 163	5	– 49	5
Swabia	– 128	4	– 26	3
Upper Franconia	– 200	6	– 39	4
Middle Franconia	+ 46	2	+ 50	2
Lower Franconia	– 375	7	– 146	7

Area	Number of persons working in agriculture and forestry (in %)	Rank
Upper Bavaria (incl. Munich)	11.2	1
Lower Bavaria	31.2	7
Upper Palatinate	19.7	6
Swabia	19.5	5
Upper Franconia	16.6	3
Middle Franconia	13.6	2
Lower Franconia	18.7	4

Chart 3: The difference between the actual and the anticipated numbers of TELEKOLLEG participants in the seven governmental areas of Bavaria, and the percentage of persons working in agriculture and forestry in these areas.
+ = over-represented
– = under-represented

Chart 3 makes it clear that rural areas where agriculture is the principal occupation are characterized by a constantly decreasing rate of participation. In the case of course I there is no relationship in ranking, whereas such a relationship has been established on a 5 per cent basis for course II.

Chart 4 deals with the TELEKOLLEG participants working in agriculture and forestry. It is also stated here how many fathers of the TELEKOLLEG participants work in these professions. This comparison makes it clear that TELEKOLLEG fills a gap here after all: The sons and daughters of persons working in agriculture and forestry regard TELEKOLLEG as possibility of advancement.

	Bavaria in %	TELEKOLLEG participants in %	Fathers of participants in %
Course I	21.8	5.3	16.7
Course II	21.8	3.3	14.8

Chart 4: The percentage of persons working in agriculture and forestry in Bavaria, the percentage of TELEKOLLEG participants and the percentage of fathers of TELEKOLLEG participants working in these professions, expressed in connection with courses I and II.

Chart 5 shows the number of female and male participants in courses I–III.

	Course I	Course II	Course III
female	1,478 (21%)	651 (21%)	449 (17%)
male	5,499 (79%)	2,424 (79%)	2,134 (83%)

This comparison shows that only about 20% of the TELEKOLLEG participants are female and that the number of female participants is still dropping: There were not so many female participants in course No. III as there were in course No. I.

A survey was also conducted with respect to the age of the participants.

Chart 6 shows the age groups of the persons who enrolled in the three TELEKOLLEG courses.

Age	Course I	Course II	Course III
15 — 19	1,950	677	578
20 — 24	1,065	599	624
25 — 29	1,744	853	720
30 — 34	1,109	499	383
35 — 39	624	222	121
40 — 44	385	110	63
45 and over	480	83	56

Chart 6 shows that TELEKOLLEG participants either enrol immediately after having completed their regular training and education, or after they have been employed for a number of years and have realized that a higher standard of education could be advantageous for them. As becomes clear in connection with other research findings, this group also includes participants working in professions with a certain standardized promotion system (salaried personnel and government officials).

Motivation Research for TELEKOLLEG

Published in:	TELEKOLLEG in the Studienprogramm of Bayerischer Rundfunk, Accompanying Research Booklet 5, Munich, 1972, Hans Schiefele, Fritz K. Bedall
Research object:	Which motives or combinations thereof make people enrol in TK? Are there motives that lead to successful completion of TK more often? Does TK appeal to new sectors of the population ("working class")?
Hypotheses:	TK fulfils its purpose only partially; the participants are a sample of the "middle class" Bavarian population; sectors of the population under-privileged in terms of education will not be represented sufficiently in accordance with their share in the overall population.
Method:	Open questions, questionnaire
Sample:	TK participants
Results:	10 motivation combinations for enrolling in TK.

1. Participants want to catch up with what they have failed to do so far. Unfavourable learning conditions (living in rural areas, very small schools, etc.) are also quoted as reasons for enrolling.
2. The participant wants to change his or her profession. The new profession requires "Mittlere Reife" or an even higher level of education. Possibly the participant does not want to change his job until he starts his TELEKOLLEG studies: TELEKOLLEG is the impulse.
3. Parenthood: Parents think there is too big a discrepancy between the things their children are taught at school and what they know themselves.
4. For these participants TK is a kind of hobby: They want to test their own abilities and perseverance.

5. The type of participant at which TK is actually directed: A person who wants to advance in the profession he has at present.
6. In this group the motivations are clear: The fact that television lessons are convenient and practical (the participants watch them at home in their own living room), that the presentations are entertaining and the teachers are friendly, makes taking part quite pleasant. Participants like the well developed presentation methods applied on television.
7. The motives in this case are that the participants are "eager to acquire knowledge". They want to have a good general education. An important argument is that they want to watch programmes no influenced by any political trends or preferences.
8. The participants in this group are of the opinion that their professions are slowly dying out in this age of increasing automation. By enrolling in TELEKOLLEG, they hope to find new jobs with better prospects for the future.
9. This factor arises due to a certain drawback in the conventional school system. Expansive and dynamic persons think that normal schools limit them considerably in their personal freedom. Accordingly, they like the learning situation in TELEKOLLEG, which is based on voluntary work.
10. This final group is made up of young people still attending school or some other kind of training facility. They expect TELEKOLLEG to support their learning efforts and assist them in preparing for examinations, etc.

An additional group of findings refers to the hypothesis stating that TELEKOLLEG participants are a sample of the "middle class" Bavarian population. It did in fact become evident that the comments made by the participants are orientated along the lines of values applied by the middle class: Ambitions, responsibility, visible achievements, rational thought, good behaviour, politeness, self-control of physical aggressions, constructive spare time behaviour and appreciation of property are approved of by the participants as society standards.

Manual workers and people living in rural areas were under-represented very considerably. Salaried personnel and government officials show special interest in TELEKOLLEG. They are therefore represented to a much higher degree than anticipated.

The Attitude Research Project Carried out in Connection with TELEKOLLEG

Published in:	TELEKOLLEG in the Studienprogramm of Bayerischer Rundfunk, Accompanying Research Booklet 2, Munich 1970, pages 116–146, H. Schiefele, F. K. Bedall
Research object:	What is the participants' attitude towards TK? How does their attitude change in the course of their TK studies? Are there differences in attitude between sub-samples of participants?
Hypotheses:	The participants' initial attitude towards TK is very positive. As time goes by, this positive approach is modified as critical factors become evident in TK. There are differences in attitude between the sexes, the age groups, and the population of rural and urban areas.
Method:	Parallel-type questionnaire for repeated application (parallel test reability: 0.90).
Sample:	TK participants from courses I, II, and III.
Results:	When TK starts the participants have a very positive attitude. This attitude deteriorates substantially towards the end of TK, but is nevertheless still positive.

The older a participant is, the more positive his attitude towards TK will be. This complies with the fact that the participants who watch TK merely in order to promote their general education have a much more positive attitude, as the participants in this group are older than the participants who want TK to serve as an aid in ensuring their professional advancement.

The participants' attitude towards TK does not appear to depend on sex.

The level of education of a participant is however connected with his attitude towards TK: People who have attended elementary school only have the best attitude.

The attitude values of the enrolled persons increase from course No. I (pioneer course) to course No. II and course No. III.

Participants who state that they want to improve their position in the profession they have at present have a more positive approach towards TK than participants who intend to start with a new profession. It is assumed that the two groups have different motivations for taking part in TK: Participants wanting to advance in their present profession are motivated by incentives.

The persons wanting to change their profession altogether are motivated by the fact that they have to avoid something. Participants in this group do not see any promotion or advancement prospects in their own job.

When considering the size of the communities, it becomes evident that participants living in medium-sized towns (10,000 – 99,999 inhabitants) have a very positive attitude towards TK, whereas participants living in villages of up to 1,999 inhabitants have the worst attitude. In general, it may be claimed that the demographical and sociological characteristics which induce high attitude values are also typical for high participation rates.

TELEKOLLEG and Group Dynamics

Published in:	TELEKOLLEG in the Studienprogramm of Bayerischer Rundfunk, Accompanying Research Booklet 3, Munich 1970, Fritz K. Bedall.
Research objects:	How does the participant regard himself while watching the programme? What part does he play? What relationship is there between the participant and the television teacher?
Hypotheses:	The television situation involving the teacher and the TELEKOLLEG participant creates a small group characterized by the classical features of such small groups, as are known from relevant research.
Sample:	TELEKOLLEG participants living in Rosenheim and Fürstenfeldbruck.
Method:	Questionnaire and semantic profile; t-tests, factor analysis, variance analysis.
Teacher as variable:	In the individual subjects the hypothesis is supported to a varying extent.
Results:	The hypothesis that TELEKOLLEG teachers and TELEKOLLEG participants form a small group during the programmes was verified clearly in almost all respects. In other words the participants most certainly have definite convictions concerning the programme, concerning the teacher, and concerning TELEKOLLEG as such. They feel that they belong together, and one member of the group thinks he knows the ideas and expecta-

tions of the others. Tendencies are developed, group integration becomes more lasting in nature, each member identifies himself with the others, and slowly certain parts are created for each participant. If such a small group develops as the participants want it to the student accordingly assumes the role of the hard-working and successful party, while the teacher plays the friendly and personality-orientated part. Should, on the other hand, the teacher contest with the TELEKOLLEG participants for the role of the hard-working and successful person the participant will regard him as a nuisance and will start to reject the subject, in so doing resorting to study methods which "by-pass" the programmes and not apply them as instruction elements. To be successful, lessons must be designed and given in such a way that teacher and the learners are brought together to form an integrated group, and the teacher must manage to make allowance for human weaknesses in his presentations. Women are especially sensitive to the characteristics of a lesson or of a teacher.

The following basic rules may be deduced from the results:

1. The fact that TELEKOLLEG is a study course must be emphasized. The small groups should be able to develop constantly.
2. Importance must be attached to the emotional factor in the lessons.
3. A quasi-personal relationship should be created towards the participants (welcoming, saying goodbye, jokes, relaxation phases).
4. The participants' self-confidence must be promoted.

Examination of the Course Effects in two TELEKOLLEG subjects: English and German

By the Institut für Unterrichtsmitschau und Didaktische Forschung der Pädagogischen Hochschule, Munich (Institute for the Observation of Teaching and Didactical Research at the Munich Teacher's Training College).

Authors:	Karl H. Bedall, Alfons Otto Schorb
Research object:	Are the TELEKOLLEG programmes (English and German) really characteristic of courses broadcast for study purposes? In order to find the answer to this question the integration of an individual programme in the overlapping context of the total course was analysed.
Hypotheses:	The number of instructions is reduced so as to increase the amount of material conveyed. Study units already acquired by the students should be integrated purposefully into the following programmes. The vocabulary taught should be broken down into difficult groups and easy groups. New vocabulary groups should first be practised intensively, and later more and more sporadically. (Hypothesis No. 3 applies only to English.)
Method:	Observation of the programmes, evaluation of the scripts.

Results: For English:

The contents of a geometric programme sample were analysed in order to determine in what way the structure of the individual programmes changed during the course. It became obvious that there was a distinct trend towards the application of a brief and restricted mode of speech:

1. The time taken for explanations, instructions, etc. decreases considerably during the course (25% of the broadcasting time at the beginning, and 2%—4% at the end).
2. The time used for conveying material to the viewers increases accordingly to approx. 25% (originally 14%).
3. The amount of repetition and summaries likewise goes up. (See diagramme on page 53).

Other variables limited in terms of contents do not change to the same extent due to the structural lay-out of the individual programmes, which is maintained more or less throughout the entire course. The possibility of increasing the participants' activity during the course was not applied. The number of words to be learnt by the participants goes up from an average of 29 per lesson in the first half of the course to 40 in the second half.

Observation of the material taught revealed that it is not attempted in the TK English lessons to indicate a certain item prior to its actual treatment. Although the programmes were repeated regularly, formation of contexts by means of implicit repetition, application and intensification of the respective language material following the introduction of this material was not attempted in the TK English course. Similarly, observation of the vocabulary used in two lessons did not show any significant results from the time when this vocabulary was introduced to the end of the course. Words just learnt are very quickly used completely at random (statistically expectable), and differences in the treatment of individual word groups (important — unimportant; heavy — light) could not be determined.

Results: For German

This subject is characterized by the breakdown of the overall contents into various groups (essay writing and the skill of expression, grammar, orthography, vocabulary, literature, history of the German language). It therefore appeared of special importance to examine the way in which the individual programmes are connected with the entire course, and to see how the sub-groups are integrated. In order to carry out this examination all implicit and explicit references to other programmes or other parts of the course broadcast either beforehand or to be broadcast in the future were counted during two phases of the course (phase 1: programmes 5—10; phase 2: programmes 40—45). The number of inter-connections determined in this way showed that the individual programme must be regarded in its context with other programmes, regardless of whether it is at the beginning of the course or at a more advanced point: A large number of references from one field to another indicate a high degree of integration in the case of the TK German course. Moreover, when the two phases mentioned above were compared, it became clear that the connections between individual programmes had increased considerably and that there was a trend towards implicit inter-connections. In phase 1 the average number of references was 4 per programme, whereas it was 16 in phase 2. The number of programmes referred to increased to about double as many in the second phase. The result of this section of the examination shows very clearly that the TELEKOLLEG German lessons are by nature distinctly a course for studying purposes.

Due to the fact that the German course is structured in a different way, the change in lay-out of the individual programmes was checked by means of an arithmetical programme sample (programmes No. 1, 7, 15, 21, 29, 35, 43, 49, 57, 63, 71, 77). At the

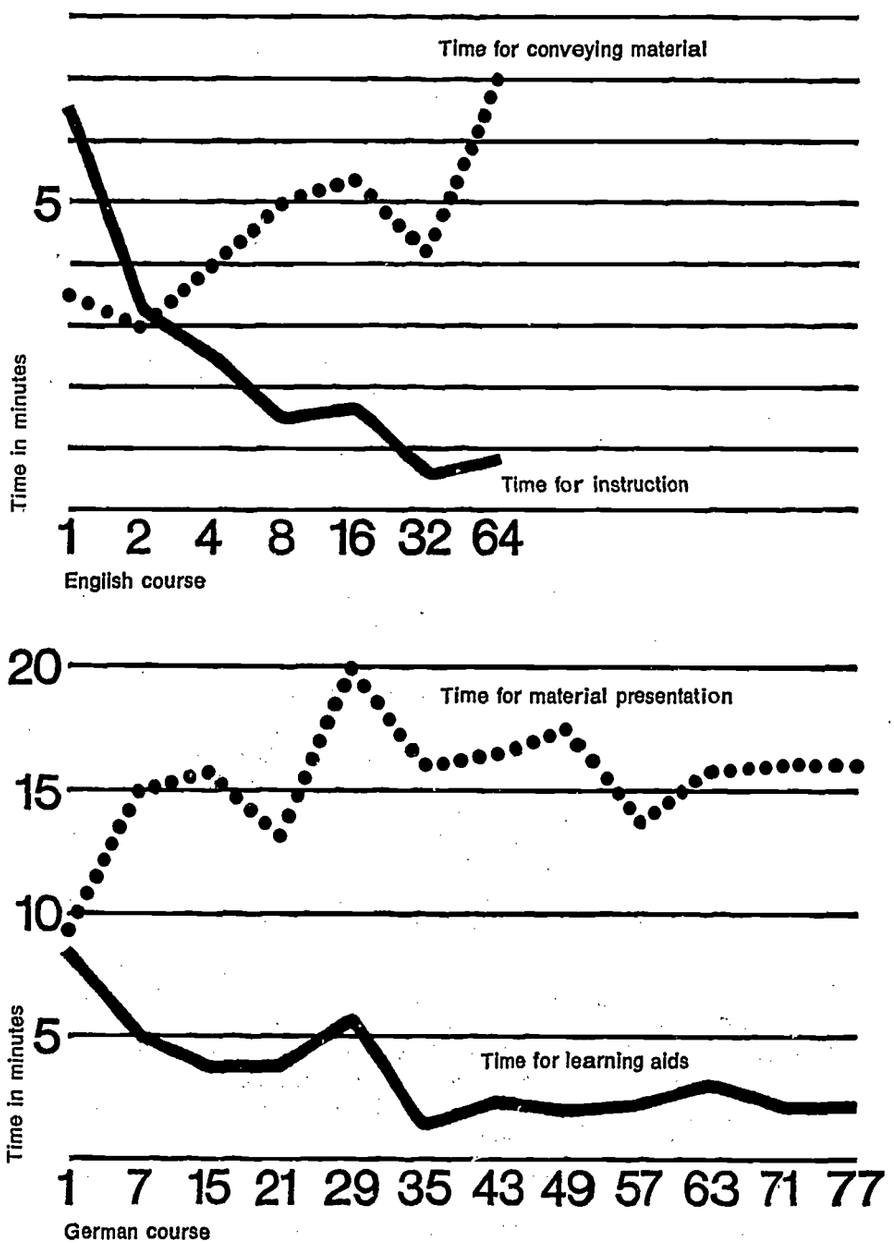

Fig. 1: The periods used for conveying the material to be learnt and for instructions and/or learning aids in selected programmes in the English and German TELEKOLLEG courses.

beginning of the course the amount of time used for applying aids was almost the same as that used for presenting the material. However, the duration of the presentation phases increases absolutely and relatively. The ratio between learning aids and material presentation is about 1:5 after the first third of the course. The trend towards increasing brevity is evident in the German course as it was in the English course. Cf. Fig. 1 in this connection.

As the course progressed, the units of material presented grew larger, which in turn counteracted the redundancies caused by the increasing integration.

Observation of a number of elementary teaching contents in essay writing and German literature from the very beginning onwards showed good results especially in the case of essay writing: The material acquired by the participants is intensified and used repeatedly.

Research on the Didactics Applied in TELEKOLLEG

TELEKOLLEG in the Studienprogramm of Bayerischer Rundfunk, Accompanying Research Booklet 2, Munich, 1970, A. O. Schorb, H. P. Deschler, K. Windisch, F. K. Bedall, Discussion in small groups of the didactics applied in TELEKOLLEG, pages 53–103.
TELEKOLLEG in the Studienprogramm of Bayerischer Rundfunk, Accompanying Research Booklet 5, Munich 1972, F. K. Bedall, H. P. Deschler, A. O. Schorb.

Research objects:	Which didactical methods are applied in the programmes? What does a comparison of the programmes in terms of didactics reveal?
Hypothesis:	The multi-media problem is solved in different ways in the various subjects.
Sample:	TK participants Selected programmes and subjects
Method:	Questionnaires on the programmes and the accompanying material; experts state their opinions on the programmes; temporal registration of objective factors while the participants are watching (duration of a glance, large shots as close ups, etc.); discussions in small groups (5–7 participants).
Results:	Questionnaires, experts' judgments, objective factors pertaining to the programmes.

The programmes in the three subjects examined specifically in terms of didactics revealed marked differences in their didactical structure and in view of the participants' reactions. The English programmes deviated the most from normal teaching patterns based on conventional school methods, while history and algebra served as comparisons. However, it has not been determined to what extent the subjects are characterized individually by the necessity to gear the didactics applied in the programmes to those used in conventional school teaching.

The subjects also differ as regards the manner in which the teacher approaches the viewers. The English teacher, for example, greets the participants and is very friendly throughout the lesson, whereas the history and algebra teachers use a formal style.

Linear structure:	A strict linear structure is applied in algebra and history. English is characterized by the systematic alternation from presentation in scenic form to explanation by the teacher. Repetitions are very frequent.

Focus on the teacher:	In algebra and history the teachers are "right in the middle" of the lessons. In English the teacher merely has the function of a presentator. He only appears if the material treated needs to be explained or intensified.
Emotionality:	In algebra emotional factors are not included in the lessons. In history, on the other hand, attempts are made at appealing to the participants emotionally. In the case of English emotional factors are consciously integrated in the lessons.
Differences in atmosphere:	While algebra gives a traditional impression, the history lessons appear sober and matter-of-fact. English is characterized by trying to make the process of learning become a game.
Media-specific presentation:	Algebra is like a normal lesson at school. In history the direct shots of the teacher are accompanied by static pictures and documents. In the English lessons a number of media-specific methods are applied, such as the skillful changes between a direct address by the teacher and an acted scene.
Language:	The language patterns used are most complicated in the history lessons. The language used in the algebra lessons is not so difficult as such, but is made more complicated by the numbers, formulae and specialized terms inherent in this subject. The English lessons are characterized by the fact that hardly any German is used.
Results:	Answers given in questionnaires

The participants have a very positive opinion of TK in all respects. Criticism of the individual subjects is to be found only indirectly in secondary factors. One of these factors is the intensity of the judgments given, according to which algebra is criticized the most, whereas English is commented on most favourably.

The most distinct differences between the subjects arise in connection with the teachers. The English teacher is regarded as pleasant, friendly and not impersonal, while the algebra and history teachers are not liked so much. The history lessons are considered too long.

A general complaint is that insufficient consideration is given to the participants' obligation to "keep the pace" of the lessons. The participants say there should be more breaks and pauses in the programmes. In addition, clear and descriptive presentations are asked for especially in algebra and history.

Results:	Group discussions

The participants are very much against criticizing TELEKOLLEG or the TELEKOLLEG teachers openly. They do not complain about any insufficiencies in the system, but say such insufficiencies are inevitable when teaching the subject matter involved.

It becomes evident in the discussions how important the teachers are. If a teacher is unpopular the participant will tend to dislike the subject. Rapid progression in the lessons is referred to as the main problem. Although the high standard of the programmes is admired (i.e. the difficulties to be overcome and the occasionally academic concept), it is this standard which often creates a demand for clarity and examples.

The participants believe that establishing work groups on a private basis would be a way out of this situation. Observation of the participants when watching the programmes showed that taking notes during the programmes — so as to retain the most important facts and contexts in writing — proves very difficult, and that brief notes alone are hardly of any help anyway.

It also became evident that the participants' concentration dropped considerably in the last third of the programmes (10 minutes).

Biology in TELEKOLLEG

The following research project was conducted by the Psychological Institute of Berne University: A Psychological Analysis of Learning Success in the TELEKOLLEG Biology Course, May 1970, K. Foppa, G. Fassnacht, L. Alberti, M. Wettler, R. Hayoz

Bayerischer Rundfunk commissioned a special research project for the secondary TK subject biology (13 programmes). Above all, this project was to provide the answers to the following questions:

- What type of biological knowledge is conveyed by the course?
- Which shortcomings does the biology course have?
- In what way do the accompanying material and the programmes influence learning success?
- Can usable examination questions be formulated?

Three test series were carried out:

1. Four groups made up of 12—15 participants were tested as to their knowledge in biology prior to the lessons: Before lessons 4, 7, 10, and 13 were broadcast, the knowledge the participants ought to have acquired in the preceding three programmes was estimated by means of additional examinations.
2. Certain types of examination questions were tested in four groups made up of 7—14 participants. The results were to enable the examiners to form suitable questions for measuring the participants' knowledge in biology individually.
3. Group 1 only watched the programmes and did not receive the accompanying material. Group 2 only received the accompanying material and did not watch the programmes.

Further data: Sex, age, education, profession.

Following each programme the test persons received a list of terms taken from the preceding lessons. They were then asked: Were these terms explained sufficiently or not?

In addition, the participants were requested to provide written criticism on each programme.

The programmes and the accompanying material were examined as to their vocabulary: Frequency charts of the vocabulary were used to provide a further analysis. The charts made it possible to prove that the programmes and the accompanying material do not always comply with one another. It became evident that names were used very often without mention being made of the functional context.

Sample: 133 persons from the Berne district.

Results:

Prior to the broadcasting of the programmes, 35% of the answers given by the participants in test series 1 were correct. Following the programmes the amount of correct answers rose to 57%. This extremely insignificant improvement caused by the programmes is attributed to the assumption that the producers did not exploit the potential of the audio-visual media in full. Most of the programmes are merely films of regular lessons. The above-mentioned assumption is supported by the fact that in test series 3 the comparison of the books-only group with the programmes-only group turned out in favour of the books group. There was no difference in achievements between the participants who watched the programmes and studied the accompanying material and those who only received the accompanying material.

A more exact analysis of the material retained by the participants provided a new aspect: " . . . superficial knowledge of the significance of some basic biological terms. The participants can, it is true, describe certain subject matter (e.g. cell structure, breakdown of plants), but their explanations are not based on an insight into the structure or procedure of the items concerned." Questions in examination papers are answered correctly if the formulations used are very similar to the wordings applied in the programmes. If this is not the case, the participants' achievements deterioriate substantially.

Proposal made by the research group: An analysis should be conducted first to find out which contents should be included in the programmes and which in the accompanying material.

The TELEKOLLEG Drop-outs

The research project examining the drop-out problem has been running since September 1968 and is to last until autumn 1973. It is being carried out by the Sociological Institut of Munich University: "Drop-outs in TELEKOLLEG. The Extent of and Reasons for Discontinued Study . A Sociological Examination."

Author:	Susanne Grimm.
Research projects:	What reasons do TELEKOLLEG participants have for discontinuing their studies before completion? Are there quantitative or qualitative reasons for this?
Hypotheses:	The drop-out rate differs in each of the seven governmental areas; there are also deviations between the individual places where the "Kollegtage" are held. TELEKOLLEG has a higher drop-out rate than the "Berufsaufbauschule". Dropping-out as such and the time thereof depends on the profession of a participant. There are characteristic differences between participants who drop out and participants who do not. There are behavioural determinants by means of which success or failure may be predicted already when a person starts studying in TELEKOLLEG.
Method:	Systems analysis of TELEKOLLEG. Written and verbal interviewing. Multiple regression, t-tests, profile analysis.
Sample:	All drop-outs and non-drop-outs in courses Nos. II and III. All leaders of "Kolleg" groups in courses Nos. II and III. A representative sample of drop-outs and non-drop-outs from Upper Bavaria for detailed interviews.

Discussion

The research done and the experience gathered confirm the assumption already mentioned, i.e. that TELEKOLLEG is an educational "adventure".

It became clear that it is not sufficient to establish a system like TELEKOLLEG and merely introduce it to the public. Rather, it is essential to first provide the basis required, so that the new educational offer can be received positively. The target groups must be approached by means of systematic information and well-conceived advertising and promotion. They must be induced to engage themselves actively in the project.

The new educational instrument should be geared to the characteristics of the target groups among the population in the best way possible. The technical potentials of the audio-visual media must be exploited in full to support a study programme, in which no significance is attached to the entertainment factor or to "casual" viewers watching the courses as a pastime.

Accompanying research projects and studies aimed at checking the system must also be incorporated. The results of such surveys should be integrated in the current lessons as quickly as possible. It is only in this way that the educational and economic risk can be kept to a minimum.

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Munich

The Role of the Teacher in Media Compound Systems

The Function of the "Kollegtag" Teacher in Telekolleg

When attempting to explain the specific function that teachers will have to assume to an increasing extent in the media compound systems of the future, and when considering the didactical consequences resulting from such functions, it appears necessary to analyse the role and the general functions of the media compound teacher in brief before dealing with the specific consequences.

I. The Implications of the Teacher's Role

Everybody has various different *positions* in society (as a son, student, and citizen), as we all belong to several social units (position systems; e.g. family, university, and the state). Each of these social positions is linked with a multitude of behavioural expectations determining the behaviour of the individual. In other words, each position is connected with a specific social *role*. Today, almost everybody in our society has to assume a professional position. Like almost all other positions, this professional position leads to contacts between the individual and a great many different groups (superiors, colleagues, and possibly also persons of lower rank). These *reference groups* require the individual to behave in a certain way and respond to this behaviour accordingly. If the individual behaves in accordance with the groups' expectations *(conformable to standards)*, they will "honour" his behaviour by taking various *positive actions* (sympathy, confidence, appreciation or promotion). However, if the individual does not behave in accordance with the groups' expectations *(deviation from standards)*, they will "punish" him for his behaviour by taking various kinds of *negative actions* (dislike, disapproval, reproof, discrimination).

We can therefore state that social roles are made up of a multitude of behavioural expectations, each of which is linked with the respective position, defined by certain standards and responded to either positively or negatively.

The success of the individual in fulfilling the expectations of the various reference groups by his *actual behaviour* depends on a number of circumstances: Are the expectations of the different reference groups compatible? Is the respective situation clearly defined in terms of expectations? Does the individual identify himself with these expectations as anticipated? Is he able to reach the achievements expected of him and does he put sufficient personal effort into the role he is playing?

In a general sense one might therefore say that *social roles differ according to the following aspects*: The number of behavioural expectations (i.e. the number of reference groups), the compatibility of these expectations (homogenous or heterogenous), the anticipated degree of identification (roles related to situations, organizations, or persons), the degree of personal achievement expected (to obey orders, to do work, or to make an independent effort), and the extent to which the expectations are defined (a description of the individual's general field of activity and his specific achievements, or a description of his activities only, or neither of the two).[1]).

[1]) For further essential information on the traditional role implications cf. *H. P. Dreitzel*, "Die gesellschaftlichen Leiden und das Leiden an der Gesellschaft", Göttinger Abhandlungen zur Soziologie, Vol. 14, Stuttgart 1968.

II. The General Functions of the Teacher

In view of the fact that the teacher's position is characterized by a large framework of individual positions, i.e. that a multitude of reference groups (pupils, parents, superiors and colleagues, and possibly also some more groups) expect him to behave along certain lines – which invariably leads to the risk of a conflict of his roles (intra-role conflict) – it is often only possible to reduce the risk of such a role conflict by the teachers giving various degrees of attention to the individual reference groups. The *pupils* naturally consitute the principal reference group for his teaching and instruction work. Nevertheless, the *teacher* has to perform a great many different functions for this reference group alone. In this case we can distinguish between: 1. the instruction function, 2. the socialization function, 3. the evaluation function.

The teacher must take all of these three functions into due consideration in all school inter-action processes. The question as to which *functions* must be given *priority* (priority of the socialization function as compared with the instruction and evaluation functions, or priority of the instruction and evaluation functions as compared with the socialization function) depends mainly on the *school level* at which the interaction process is taking place. In addition, the teacher will have to decide on various *orientation alternatives in the case of each function*. (In the case of the socialization function he must assume either a neutral-affective or a purely affective attitude, whereas in the case of the instruction function he must choose between the conveyance of specific or relatively unspecific skills.) Obviously, the orientation applied by the teacher will depend primarily on the *age of the learners*. (As regards the evaluation function the teacher must always attempt to be impartial towards all of his pupils and towards each individual pupil, independent of the age of the learners.)

This description of the teacher's general functions shows that the *role of the teacher* can be defined as a role which allows a lot of freedom to the teacher's own initiative and his individual style of performance (presentation standards). Accordingly, the teacher must make a considerable personal effort in handling the respective situation. (That means on the one hand that he must tackle each individual task with personal effort, and on the other hand that he must maintain a critical distance between himself and the expectations of the various reference groups.) It is also very important "that the teacher's personal achievements ... belong to the expected behaviour" in his role "and are not ... only ... part of the individual role implications"[2]), "because individual style and the ... (frequently) novel way of tackling a problem are precisely what the role requires of the teacher."[3])

In order to establish a *general path of orientation* for the teacher's work it is necessary to know both the *learners' requirements for studying* and the *teaching strategies* by means of which the teaching aims are to be reached.

Within the scope of his *instruction work*[4]) the teacher will invariably tend to pursue *two learning aims* independent of the learner's age and school level:

1. To improve cognitive styles so that information can be "processed" more easily, and
2. to establish an intrinsic system of achievement motivation (=related to the subject matter)[5]).

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[2]) *H. P. Dreitzel*, loc. cit. page 218.

[3]) *H. P. Dreitzel*, loc. cit. page 138.

[4]) For defining the teaching aims which the teacher must pursue within the framework of the socialization function, cf. *H. P. Dreitzel*, loc. cit.

[5]) Cf. *H. Roth*, Einleitung und Überblick (An Introduction and Survey), published in: *H. Roth* (editor), Begabung und Lernen (Talent and Tearning), Deutscher Bildungsrat, Gutachten und Studien der Bildungskommission (German Educational Council, Examinations and Studies carried out by the Educational Committee) Vol. 4, Stuttgart 1969, page 35.

The results of studies dealing with the learning process show that the realization of these two learning aims by applying *tasks of medium difficulty*[6]) — which arouse a hope for success on the part of the pupil and provide the possibility of avoiding mistakes — motivates the learner in the best possible way.

If one attempts to reduce the risk of conflicts resulting from the "variable framework of roles which require more exact interpretation"[7]), and if it is also attempted to decrease the factor of unsecure und uneasy behaviour (or the risk of frustration) and to *facilitate* the task of the teacher in defining his "personal role", three steps must be taken:

1. The *concrete teaching situation* in which the teacher has to play his role *must be defined,*
2. the teacher's *specific functions must be made clear,* and
3. the *consequences* influencing his *specific teaching strategy* (i.e. his teaching method andhis style of teaching) *must be shown.* This process indicates the way in which the *change of the teacher's role* must take effect: The teacher must specialize and "professionalize" more closely on one subject (i.e. he must become an expert in a certain field).

Accordingly, the *role played by the teacher* is becoming more and more a role relating to a particular *situation.* The "definition of the situation" applying to the teacher thus becomes the principal subject of our critical reflections. It is only by defining the various situations in which the learning and teaching process takes place that the possibility is increased of changing the role implications among the various groups of teachers.

III. Media Compound Systems as Teaching and Learning Systems

Before dealing with the question as to which specific type of organization the teaching and learning process in media compound systems is institutionalized in, we must first indicate the general conditions that must be fulfilled for making the teaching and learning process successful. The cybernetic systems-theory model — which defines a teaching/learning system as a feedback system (circuit) — lends itself very suitably for illustrating the most important aspects of the teaching and learning process.

1. The teaching/learning system as a feedback system

The *cybernetic systems-theory*[8]) is intended to register *structural elements* of complex and dynamic systems (= system qualities) — e.g. structural elements of the teaching/learning process — and illustrate these elements *like models*[9]). The *general conditions* (invariancies) must be indicated by way of *abstraction,* as these conditions must be fulfilled if the teaching/learning process (= communication process) is to be successful. In this context *systems* — and thus also the teaching/learning systems — are re-

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[6]) Cf. *H. Heckhausen,* Förderung der Lernmotivierung und der intellektuellen Tüchtigkeiten (The Promotion of Learning Motivation and Intellectual Skills) published in: *H. Roth,* Begabung und Lernen (Talent and Learning) loc. cit., page 200.

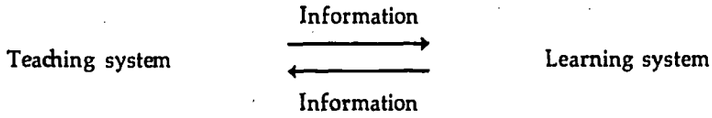
[7]) *K. Mollenhauer,* Die Rollenproblematik des Lehrerberufs und die Bildung (The Problems of Roles in the Teaching Profession and Education) in: *K. Mollenhauer,* Erziehung und Emanzipation (Education and Emancipation), Munich 1968, page 78.

[8]) The two main implications that form the basis for this model are the *assumption of equilibrium* (which means that the system tends to re-establish the stability endangered by external effects by means of the feedback procedure), and the *assumption of analogy* (which means that the behaviour of animals and human beings and physical and organic phenomena are treated as formally equal).

[9]) Models of this type are *"heuristic means"* which serve to find new insights.

garded as *feedback systems* (i.e. circuits). To put it in simple terms, this means that there are processes of *conveying information* and *processing information* taking place between the teaching system (i.e. the teacher) and the learning system (i.e. the pupil).

The teacher has the task of controlling the pupils' learning process, while the pupils inform the teacher of their learning progress.



Due to this influence on the part of the teacher (and on the part of other interaction partners = fellow pupils) the pupil's inner learning conditions are altered, which is expressed by a presumably positive change in behaviour = *learning).*

Within this feedback system we distinguish between *various phases* (teaching steps) as to their influence on the overall system. The *teaching process* takes place in *four different teaching steps:*

1. Planning of the learning process
2. control of the learning process
3. supervision of the learning process, and
4. planning the learning process anew.

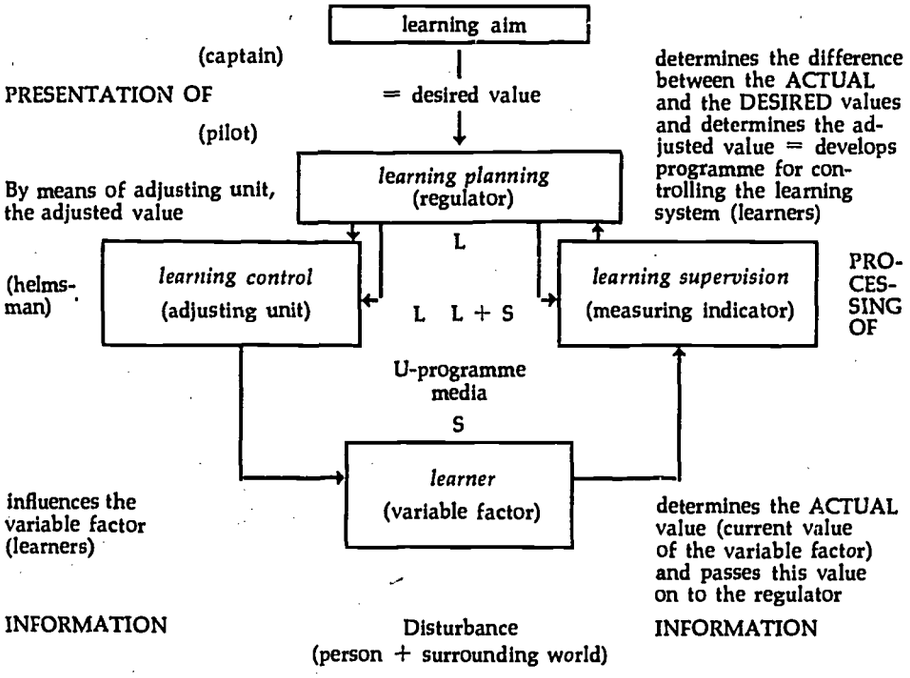
In order to render the learning process successful there must be an *interaction effect* (general feedback) within this sequence of phases. This effect is achieved by each learning step being related to the preceding one and by the constant communication (circular causality) between the various interaction partners involved in the learning process (teacher-pupil, pupil-pupil). In other words, this means that in *planning the learning process* (1) the teacher takes the learning aims (desired values) as a basis, considers how he should apply the didactical means *(control of the learning process)* with which he wants the learners (variable factor) to reach the learning aims (2), checks the learning succes *(supervision of the learning process)* which the learners have achieved in the course of the learning process (3), compares the learning success achieved (actual values) with the planned learning aims (desired values) and adjusts the planning of the following learning phase *(planning the learning process anew)* accordingly (4).

Expressed in more general terms we can distinguish between two principal phases in the learning process:

1. The *learning control* phase (conveying of information), and
2. the *learning supervision* phase (processing of information).

In addition to the *general feedback* within this sequence of phases — as mentioned in the foregoing — there is also a *specific feedback* in the learning supervision process (teacher–pupil, pupil–pupil). This specific feedback serves to determine the learning success (the pupil's knowledge and standard of learning) achieved and makes allowance for the result of this learning supervision process in the new learning control process.

Learning system = feedback system (sequence of phases)



During the learning control and the learning supervision phases the teacher must not only reflect on the specific teaching strategy to be applied (teaching method and style), but must also make allowance for the *learners' cognitive and motivational conditions*. Both of these conditional variables must be geared to one another so as to render the teaching process successful.

2. *The teaching/learning process in media compound systems*

Media compound systems are instruction systems in which various *media* (television or radio, textbook and teacher) are combined as means of conveying knowledge in communication process according to their specific functions[10]). Remote studies at a university level, "Funkkolleg" and "Telekolleg" are media compound systems which meet this description. In what way do these *innovation models*[11]) differ from the *traditional organizational forms* of the instruction and learning process?

In the "Telekolleg" media compound system *information is conveyed* not by a teacher present in the room (as in the case of traditional teaching systems), but by an audio-visual medium: television. *Information is processed* in "Telekolleg" with the help of written accompanying material which is sent to each student and must be studied by the students on their own. (In the case of conventional teaching systems this information is processed during the lessons according to its degree of significance.) Both of these differentiation criteria — conveyance of information by audio-visual

[10]) Cf. G. Dohmen, G. Kadelbach et al., Fernstudium — Medienverbund — Erwachsenenbildung (Remote Study — Media Compound — Adult Education), Brunswick, 1970, page 21.

[11]) The term "innovation" is used here in a different way from the term "reform". It need not be discussed in this paper that these technological innovations cannot replace the necessary educational reforms (reforms of the curricula and reforms of school organisation structures), but can only supplement them.

means and individual processing of information by each student on his own — manifest that these two functions of the "Telekolleg" learning process take place outside of a school, i.e. by way of remote study. In order to compensate the *isolation effect inherent in the remote study system* so-called "Kollegtage" are held every three weeks, where the students have the opportunity of attending half-day *direct teaching sessions* at the towns where the "Kollegtage" are organized.

IV. Critical Reflections on the Role Implications of the "Kollegtag" Teachers

Before analysing the functions to be fulfilled by the "Kollegtage" and thus describing the role played by the "Kollegtag" teachers, it is first necessary to deal with the specific teaching situation prevailing at the "Kollegtage".

1. The "Kollegtage" as a specific teaching situation

The learning situation prevailing at the "Kollegtage" can be compared with the classroom situation in the traditional teaching system in one respect: Both of these learning situations are *direct*.

However the learning process in direct teaching is not a feedback process (circular system) for all the learners. First of all, the control means applied do not support all of the learners in an adequate way, and secondly not all the learners exploit the possibility of direct supervision — which would be a direct support of their learning success. Accordingly, direct teaching can in the case of most learners be described as a *teaching system* with *sporadical direct feedback* and *partially indirect* (generalizing) *feedback*.

Now where are the differences between direct teaching in traditional teaching systems and direct teaching at the "Kollegtage"?

1. The *difference in frequency* of *direct teaching* in traditional systems (daily) and in this media compound system (every three weeks) increases and decreases respectively the *possibilities of direct and indirect feedback* and of the direct and indirect support of the learner required for ensuring learning success. This most certainly applies if feedback is taken as the exchange of information between two interaction partners (teacher–student, student–student). In turn, this makes the *degree of satisfaction and frustration vary* which the learner experiences in traditional teaching systems and in media compound systems.
2. If we proceed from the fact that the "Kollegtage" are merely one element within the "Telekolleg" media compound system, the function of these direct teaching sessions can only be described adequately when considering this *media compound system* as a whole in the form of a *teaching/learning process*. It is only within the framework of such an overall viewpoint that it is possible to grasp the implications connected with the factor of *compensating the isolation effect*. Whereas the teacher in the traditional teaching systems takes an active part in all the phases of the learning process and thus fulfills all of the necessary functions — conveyance of information, control of the information processing phase and learning supervision — these functions are usually delegated to other media in the case of media compound systems. The learner is thus required to apply these other media in his self-studies. To be more precise, let us consider the media compound system as a feedback system. In this way it becomes evident that there are *factors* to be found in this teaching/learning system which make it *more difficult to achieve a learning effect*. In media compound systems only *half of the phase sequence is fully developed*, i.e. the phase of presenting information (the planning and control of the learning process is based on the programmes and the accompanying material). The *other half of the phase sequence*, i.e. the phase of processing information — in

which supervising the learning process and integrating the result of this supervision in the new learning plans and in the learning control phase is of decisive importance for the learning success — is *only developed to a minor extent*. This means that the learning supervision phase only occurs seldom (at the "Kollegtage" and in the grading examinations), and that the results of such supervision are never integrated in the new learning plans and the learning control phase (only a few of the "Kollegtag" teachers are examiners at the same time, and they are never concerned with the drafting and compilation of the programmes and the accompanying material). Accordingly, it may be stated that the "Telekolleg" media compound system has *insufficient feedback qualities* resulting from the relatively *infrequent learning control phase* and the very *restricted possibilities of learning supervision*. These insufficient feedback qualities lead to *learning obstructions* for the learner, which are only compensated to a certain extent by the "Kollegtage". It is therefore necessary to be aware of these learning obstructions inherent in the overall system, so that the "Kollegtag" lessons can be held in such a way that they become an optimum compensation herefor.

3. The third situational factor of the "Kollegtag" lessons is the *learners' social and psychic situation*. The learners attending the lessons given by the "Kollegtag" teachers are adults who have already passed through the primary socialization phase in their families and the secondary socialization phase in their professions. They play a multitude of situational roles, quite like the teacher himself. In addition, they have voluntarily assumed the role of a student once again, which frequently is a conflict opposing their other roles (inter-role conflict: student's role versus professional role; student's role versus family role). And they are often confronted with ambivalent expectations (dependence-independence) in the role of a student (intra-role conflict). If the teacher wishes to assist the learners in channelling their various role conflicts, he must:

   a) be able to *appreciate their other role obligations* — exceeding the scope of their role as students — and

   b) *accept them as equal partners in their student's role* and treat them accordingly, in so doing integrating them into the interaction process as partners of equal significance. Such acceptance and recognition of the students as partners does not only comply with the fact that they are adults like the teacher himself — and being adults they must behave autonomously in all the other roles they play — but is also in line with the independence they must show when participating in the learning process of the media compound system outside of the "Kollegtage".

   c) In addition, the "Kollegtag" teacher must show special *appreciation of the students' affective and cognitive learning difficulties*, which result from the remote study situation and the isolation caused thereby. The "Kollegtag" teacher has to express this attitude by taking special didactical steps (teaching methods and style).

2. *The functions of the "Kollegtag" teacher*

We must now transpose the general functions which the teacher has to fulfil in each school interaction process to the specific teaching situation prevailing at the "Kollegtage". The question as to which functions must be given priority depends on the position the "Kollegtage" have in the media compound system. It has already been mentioned that within the "Telekolleg" media compound system the conveyance of information is carried out by the television medium, while the processing of information is delegated to the "Telekolleg" students on the basis of the accompanying material. The

delegation of these two functions to the remote study elements indicates the priority rating of the individual functions to be fulfilled by the "Kollegtage" within the framework of the direct teaching process, viz.:

1. *An evaluation function* (i.e. a subsequent supervisory function necessary due to the nature of remote study).
2. *An instructional function* (the contents and nature of which result from the television students' need to "brush up" their knowledge, i.e. the instructional function of the "Kollegtag" teacher can in this case only be regarded as an aid for the students in processing information). The "Kollegtag" teachers have to fulfil two special tasks within the framework of this ancillary function:
   a) They must provide *motivation support*, i.e. they must ensure that the "Telekolleg" students' intrinsic achievement motivation[12]) is reinforced, and
   b) they must offer *specific cognitive learning aids* for processing the information conveyed by the programmes and the accompanying material.
3. The "Kollegtage" have *a socialization function*. As, however, the "Telekolleg" students have already passed through the primary and secondary socialization phases, the socialization effect caused by the "Kollegtage" is merely a non-intentional resocialization function[13]).

If, over and above this functional element, we once again attempt to present the *general function of the "Kollegtage"* within the media compound system, the following can be said: The "Kollegtag" lessons have the function of connecting the individual elements — the programmes and the accompanying material — (systems cooperation). In other words, these lessons must fulfil specific functions for supplementing the mass media information function and for ensuring an independent information processing function. When relating this to the *role played by the "Kollegtag" teacher* this means that the teacher has a significant conveyance function within the media compound system and must act as the link between the contents presented by the media and the motivational and cognitive need for further knowledge arising on the part of the learners.

If we now apply these general statements to the lessons themselves it may be claimed that all of the four teaching steps (planning of the learning process, control of the learning process, supervision of the learning process, renewed control of the learning process) are also relevant within the functional sub-system constituted by the "Kollegtag" lessons, but that these teaching steps are nevertheless re-structured in a specific way resulting from the position taken up by the "Kollegtag" lessons in the framework of the overall system (i.e. the media compound system). The *learning situation applying to the "Telekolleg" students* must always be taken as the central aspect of all didactical reflections. This learning situation is on the one hand characterized by the restricted indirect support offered (motivational and cognitive learning aids), by the restricted direct support (supervision of learning sucess in conversations and in writing) and the feeling of frustration resulting therefrom. On the other hand, the learning situation is characterized by the fact that the students are adults subject to a plurality of roles with various potential role conflicts.

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[12]) "Intrinsic" learning motivations (= related to the subject matter) must also be replaced by "extrinsic" learning motivations (= not related to the subject matter — praise from third persons). Cf. *H. Heckhausen*, loc. cit., page 197.

[13]) As the socialization process can never be absolute and complete in itself, the past is transposed to the present in he case of resocialization, whereas in the case of secondary socialization the present is continuously linked with the past (primary socialization). Cf. *P. Berger* and *T. Luckmann*, Die gesellschaftliche Konstruktion der Wirklichkeit (The Structure of Reality within Society), Stuttgart 1969, page 174.

In the preparatory phase of *planning the learning process* the "Kollegtag" teachers have to acquire information on the contents of the programmes and the accompanying material and must compile the examination sheets in accordance with the most common error categories (special learning difficulties).

In the *learning control process* the main duty of the "Kollegtag" teacher is to restrict his instruction work (moderator function), and to consider the learners' need for further knowledge when providing motivational learning aids (animator function) and cognitive learning aids (conveyance of specific study techniques and aids for processing information).

In the *learning supervision process* it is necessary to supplement the self-testing exercises done individually by the students, by providing exercises corrected by others (student-student; teacher-student).

In the *renewed learning control process* the methods used for intensifying the knowledge acquired (repetition and exercises) must be applied according to the learners' level of knowledge and the needs expressed.

V. Didactical Consequences

1. The teaching methods

If we regard teaching methods as specific procedures by means of which certain learning aims are to be reached, we must consider these methods to be independent variables influencing the students' learning behaviour and — accordingly — their learning success. We can distinguish between learning methods on the basis of the principles they emphasize and/or neglect. The selection of learning methods depends on:

a) The learning-psychological conditions to which the learner is subjected, and
b) the specific learning aids (learning objectives) to be conveyed in the respective teaching/learning process[14]).

When examining the *learning-psychological conditions applying to the "Kollegtag" learners*, i.e. the adults whose emancipation and self-confidence is to be supported, it is essential to integrate the learners in the learning control process. (Although the role played by the "Kollegtag" teacher is related to a certain situation, this situation is a "non-complete" one. The teacher's general scope of duties is predefined, but his specific work must invariably be determined anew depending on the interaction partners involved.)

These considerations make it clear that the "Kollegtag" lessons must be *"centred on the students"* (and not "centred on the teacher"). This approach offers — in accordance with the results of learning research — the advantage that it stimulates the students' activity (asking questions, thinking along critical lines).

When applying the comments made above to the teaching method, this means that *"active" teaching methods* (and not "receptive" ones) must be given primary significance:

a) The *"discussion method"* (not the "lecturing method"), and
b) *"group teaching processes"* — formation of small groups and co-operation of partners (not conventional "face-to-face" teaching with the teacher standing in front of the class).

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[14]) Cf. *K. H. Flechsig*, Die Steuerung und Steigerung der Lernleistung durch die Schule (Controlling and Increasing learning Achievements by School Work), published in: *H. Roth* (editor), Begabung und Lernen (Talents and Learning), loc. cit. page 472.

Apart from indicating how these teaching methods promote the learner's activity, learning research has also shown that the *"discussion method"* also leads to a "change in attitudes, human relationships and self-estimation and appreciation", whereas it is the *"group teaching-processes"* that render mutual supervision and assistance possible[15]).

As soon as we transpose these didactical reflections to the learning objectives – i.e. the specific learning aids – to be conveyed in the "Kollegtag" lessons, the following consequences arise:

In the case of the *evaluation function* the supervision of the learners by other persons (which is to supplement self-supervision) cannot be carried out by the teacher only (supervision in writing and discussion of the examination sheets), but also by way of mutual supervision on the part of the students (during discussions and the group teaching processes), so as to increase the direct intensification and support effect.

In the case of the *motivation function* the teacher must help the learners in reducing their affective learning inhibitions by confirming the results they achieve, by selecting the correct tasks (average degree of difficulty) and by praising the students and encouraging them in their work. In addition, however, the students must also have the possibility of "mentioning things they do not like"[16]), so as to reduce the timidity factor.

In the case of the *cognitive-instrumental function* (i.e. conveyance of specific study techniques and assistance in processing information) initiatives must be taken by the students and their cognitive learning inhibitions, which must be decreased by discussions and group work. When applying these teaching methods the teacher should at most be a coordinator.

2. Teaching styles

If we regard "teaching-style" as the teacher's interaction behaviour towards the learner, his style of teaching must again be taken as an independent variable which influences the students' behaviour. To put this in a more general way, it may be said that the teacher's behaviour is a function of the learning objectives to be reached, of the student's present behaviour, and of the teacher's personality[17]).

The effect of the teacher's behaviour is in turn dependent on:

a) The age of the learners,

b) the specific functions of the respective teaching situation, and

c) the type of achievement motivation applied by the learners[18]).

In view of all the functions which the "Kollegtag" teacher must fulfil in his lessons, a *"social-integrative"* (and not a "dominating") style of teaching must be taken as the basis for his interaction behaviour.

The "social-integrative" style of teaching – which implies that the teacher does not ask so many questions, that he approaches each student individually (and not the class as a whole), that he is reserved in the statements he makes and that he shows appreciation and understanding in conflict situations – renders it possible to make the *students behave actively* (spontaneous, creative, self-critical, social behaviour).

Moreover, it is only the "social-integrative" style of teaching that provides the casual classroom atmosphere needed for *reducing the* "Telekolleg" student's *frustration* experiences (fear, lack of self-confidence, insecurity, failure), thanks to the specific classroom situation created in this way.

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[15]) *K. Ingenkamp*, Handbuch der Unterrichtsforschung (Learning Research Manual), Vol. II, Weinheim 1970, page 1297.

[16]) *J. Weinberg*, Studienbegleitzirkel im Medienverbund (Accompanying Study Group in a Media Compound), published in: *G. Dohmen, G. Kadelbach* et al., loc. cit., page 103.

[17]) Cf. *K. Ingenkamp*, loc. cit. page 1314.

[18]) Cf. *K. H. Flechsig*, loc. cit., page 484.

VI. The "Kollegtag" Teacher's Innovation Function

"Innovations" imply a change of the means (and, to a very considerable extent, also a change of the objectives) applied within the framework of lessons aiming at an increase of the effectiveness and the democracy of teaching.

If, on the one hand, we presuppose that anything unusual will at first be rejected by the student for affective reasons, and if, on the other hand, we consider that personal involvement — which the "Kollegtag" teacher must show in his role — will not become possible until there is no "mental reservedness", the fact that a "Kollegtag" teacher accepts his role voluntarily seems to be favourable for his assumption of the innovation function.

We can also assume that the attitude towards scholastic innovations will become more and more positive as the requirements resulting from a new role are made more concrete. An insight into the conditions prevailing in a novel teaching situation — as in the case of the "Kollegtag" — does not only increase role availability, but must also enable the "Kollegtag" teacher to comply with the anticipated role behaviour and must lead to a change in his appreciation of the role.

The *three decisive attitudes* which the "Kollegtag" teacher must comply with in the framework of his role are as follows:

1. He must appreciate that *he does not have to carry out* his traditional function of *presenting the learning material*, as this function has been delegated to other media (the programmes and the accompanying material).
2. He must appreciate that he must fulfil a *"reserved control function"*[19]) so as to enable the students to be more active.
3. He must appreciate that he must use *new teaching methods* so as to reach the learning objectives set for the "Kollegtag" lessons (these methods being the same as those already demanded in school reforms), and that the success of the "Kollegtag" lessons depends essentially on how these methods are applied.

It should be emphasized especially that, if he is to fulfil these roles, the teacher must be able to alter his entire traditional role behaviour and role appreciation.

This outline of the achievements to be reached by teachers in media compound systems shows clearly that these novel teaching functions *are not a "reduction in the quality of the teacher's work"*[20]), but rather that these new teaching systems *require different qualities* of the teacher, as compared with those required by the traditional teaching systems. The teacher naturally still has a *central* position, as the "Kollegtag" is the *"melting pot"* for the elements used in the media compound system. This applies in three different ways:

1. Media instruction does not become effective until it is re-personalized. Only decoded information has a feedback effect on the individual[21]) (de-coding function).
2. The willingness of the learner to try hard and make an effort can only be maintained if he is supported in his learning motivation (motivation function).
3. Lasting learning success can only be achieved if the learner sees that there is a response to his efforts (supervision function).

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[19]) *W. Zifreund*, Zur Berufsrolle des Lehrers angesichts einer durch Unterrichtstechnologie veränderten Schule (On the Professional Role of the Teacher in Schools Changed due to Modern Teaching Technology), published in: *U. Lehnert* (editor), Elektronische Datenverarbeitung in Schule und Ausbildung (Electronic Data Processing at School and in Training), Munich 1970, page 37.

[20]) *W. Zifreund*, loc. cit. page 37.

[21]) Cf. *K. Meissner*, Systemkooperation — Bildungsverbund und die Rolle der Volkshochschulen (Systems Cooperation — Educational Compounds and the Role Played by Adult Education Schools), published in: *G. Dohmen, G. Kadelbach* et al., loc. cit., page 96 ff.

Summarizing, the following statements may be made: The role played by the "Kollegtag" teacher is that of an expert. However, this expert function automatically leads to a reduction in the teacher's function as a leader[22]). This nevertheless means that the "Kollegtag" teacher can make a substantial contribution to making the schools more democratic thanks to the change of his role behaviour and role appreciation. It is naturally not possible to make such a change unless there is no unreflected identification on the part of the teacher with his usual modes of behaviour[23]). The first step in the introjection of such a change of roles is that the teacher realizes the altered teaching conditions brought about by the introduction of media compound systems. It is then the teacher's duty to alter his attitudes and — accordingly — his actual behaviour due to this change of approach.

The following three conditions must be fulfilled if the teacher is to change his attitudes and behaviour successfully and efficiently:

1. He must constantly check his own role behaviour.
2. He must constantly exchange experience with colleagues carrying out the same expert function.
3. Further training courses must be organized which give the teacher the possibility of participating in behavioural training related to the specific requirements of his profession.

These three ways of supporting the role played by the teacher would all be in line with the principal significance of the teacher as the "carrier" of the innovation process. The "Kollegtag" teacher's sucess in fulfilling his role will, among other things, be of decisive importance for making the new media compound systems become promising and successful teaching systems in the future.

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[22]) Cf. *W. Zifreund*, loc. cit. page 38.
[23]) Cf. *W. Zifreund*, loc. cit. page 34.

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The Quadriga Funkkollegs

1.

1.1 The democratic conception of equal educational chances for all, without hindrance, as a fundamental socio-political principle,

the extension and consolidation of basic and advanced education at all levels, in response to the growing ingress of the sciences into a high industrialized and promotional society,

the vital provision of study not or only inadequately coped with by our educational system for those qualified for higher education, but belonging to strates of society neglected as yet,

and the revolutionary influence of science and technology on learning habits,

present a multitude of problems and therefore create dangerous bottlenecks in our educational system which cannot be removed by conventional educational policies, curricula, teaching and learning methods, and organizations.

1.2 These are some of the educationl tasks before us:

1. providing access to systematic education, also at university level, for as many people as possible;
2. facilities for proceeding from *one* level of the educational system to the *next* in the form of adequate teaching methods such as courses in background and enrichment, and transition courses (e.g. between A-level and university);
3. provision on a large scale of group seminars for all who follow professions involving the application of science, whose special field is subject to rapid change or who are engaged in new branches of science;
4. the preparation of study units including audio-visual media, to allow for more individualized studies less dependent on lecturers, using autodidactic materials (in the sense of "independent study"); ideally, this requires alternating phases of correspondence study and group tuition, related to potential participants and study aims, in well balanced study units or assignments;
5. the inclusion of new subjects (lines of study) which are relevant to definite objectives and qualifications in our society, in the vocational training programme.

1.3 The introduction of group study methods meets with special difficulties which particularly apply to the academic institutions of the German Federal Republic. Though nobody will deny the vital need of a widespread system of group study, we are still far removed from its realization. Although there are part-time and full-time training facilities for a growing number of professions, these facilities are limited to pragmatic considerations (improvement of professional skills) marked by inadequate scientific standards (lack of sound theory), by a provincial outlook, poor educational services, and often by insufficient resources.

The thesis put forward here is that this situation can only be improved fundamentally, if the higher seats of learning "qua institution" apply themselves to group studies (good will on the part of university teachers "qua person" is not enough), and if group study is given higher academic priority.

The inherent difficulties are not attributable only to the overcrowding of universities and financial bottlenecks; what is needed most are study-group units of a truly novel didactical lay-out taking into consideration the professional experience

of students; recent scientific data, primarily methodological, can then be applied to complement the qualifications needed for professional progress; it is also essential to develop new teaching and learning methods (more individual study, more graphic impact) compatible with the learning ability and habits of adults, taking into account their working habits (occupational stress, weekend and holiday routines, etc.).

1.4 Group study models are already found at some academic institutions (e.g. at the Konstanz and Tübingen universities for teaching staff enrichment courses), their purpose being to *prepare* for the provision of a widespread group study system, taking into account the requirements already enumerated. As yet, however, there are not enough to make an appreciable difference, particularly in emergency situations (e.g. lack of teaching staff for specific subjects).

Hence the call for help to the broadcasting corporations as administrators of efficient mass media. The Quadriga Funkkollegs is but *one* pedagogical answer, or rather the attempt at an answer, to the socio-political situation already described. However, it differs from the group study models of individual universities in so far as they represent large-scale experiments which do bring appreciable and immediate relief in emergency situations.

2.

2.1 The following bodies are responsible for the Quadriga-Funkkollegs:

1. the four south-west German broadcasting corporations Hessischer Rundfunk, Saarländischer Rundfunk, Süddeutscher Rundfunk, and Südwestfunk in association with Radio Bremen;
2. the German Institute for Remote Studies at Tübingen University, Deutsches Institut für Fernstudien (DIFF);
3. the Associations of Volkshochschulen (Open Colleges) of Baden-Württemberg, Hessen, Rheinland-Pfalz, Saarland, and the Land Bremen;
4. the Ministries of Education of the Länder Baden-Württemberg, Hessen, Rheinland-Pfalz, and the Bremen Senator for Cultural Affairs;
5. representatives of the academic institutions of the Federal German Länder, whose inclusion is subject to further negotiation.

In principle, the "Quadriga Funkkollegs" are at the disposal of all interested broadcasting networks, and Länder. They are also available outside Federal territory (this is currently the case with Switzerland; for some time there have also been contacts with Austria).

2.2 The major principle of co-operation between partners of such variety is a well defined allocation of responsibility, functions and costs, coupled with safeguards for the required planning and co-ordinating work.

2.3 As to the division of work, the broadcasting corporations will be responsible for the programmes, the German Institute for Remote Studies (DIFF) for the printed study material, the Volkshochschulen for accompanying group studies, and the Ministries of Education for examinations.

2.4 The supreme administrative body is the Planning Committee; the above-mentioned partners are represented in the committee with equal rights. The Planning Committee chooses new subjects for the Quadriga Scheme and deals with organization and publicity; it examines the curricula (study aims, subjects, etc.) developed by working committees, and discusses, or approves, their overall lay-out. Special sub-committees of the Planning Committee, such as the Board of Certification and Examination, take charge of particular projects, in which certain part-

ners may have greater powers, depending on the division of work (e.g. Ministries of Education, Board of Certification and Examination).

2.5 The question of partnership with academic bodies is still relatively open. Attempts to encourage their participation "qua institution" succeeded in the case of two Funkkolleg projects, but failed in the others. Fresh efforts must be made with each new course; also to be decided is the role universities are to play in the Planning Committee – a role which must take into account bodies represented in the universities, and which must be compatible with the efficiency of the Planning Committee (limited membership).

2.6 Each research team preparing a particular Funkkolleg is largely composed of qualified experts in this field, pedagogues and audio-visual and correspondence tuition specialists. The freedom of education is guaranteed. Authors for broadcasts and printed study materials are delegated to the research teams.

2.7 The Quadriga Central Office in Frankfurt acts as the administrative headquarters of the Funkkolleg Scheme, under the directorate of one of the four broadcasting corporations (cf. 2.1-1.).

2.8 This co-operative model has so far worked with a minimum of staff, and, on the whole, quite efficiently, but still has to deal with a number of unsolved problems (cf. 5.2).

3.

3.1 The "Funkkolleg on Understanding Modern Society", produced by the Hessischer Rundfunk (1966–1969), could be said to have anticipated Quadriga's "Funkkolleg", although it did not yet combine correspondence and audio-visual tuition. It consisted of a preparatory term and one term each in Economics (Professor Häuser), Politics (Professor Fetscher), Law (Professor Wiethölter), Modern History (Professor Kluke), and Sociology (Professor Ruegg). Each of the five terms comprised 20 lectures and 20 courses lasting 45 minutes each. After every term, assignments written at home determined admission to the graduation course.

There was no printed correspondence material, apart from an occasional consignment of stencilled tables, graphs, bibliographies, etc. On the other hand, 16 ancillary study groups were established by the Volkshochschulen, as were other informal kinds of group study. Those to benefit most from obtaining certificates were school teachers, who thus qualified for teaching Social Science. Overall participation in the five terms, including repetition terms, was 3500; 855 obtained certificates.

3.2 The first combined correspondence and multi-media project, and at the same time the first Funkkolleg of the Quadriga Scheme, was the two-term series of courses in Pedagogics by Professor Klafki and his collaborators from Marburg University (1969–1970), under the directorate of the Hessischer Rundfunk. It was for this Funkkolleg that the co-operative model mentioned above was developed and first tried out. Its 40 60-minute broadcasts which were partly based on team-teaching, were accompanied by 8 printed study guides ("lesson sheets") aimed at didactically integrating the printed material with the broadcasts. Over a hundred study groups and informal seminars added another medium: the study group tutor and the self-improving process within groups, so vital for the social learning phase.

Apart from the first assignment, all tests were evaluated by computer at the Coordinating Board of EDP Application in Education, Stuttgart, and the Stuttgart IBM Data Processing Unit for Schools. Of the 12 300 participants enrolled, 3725 passed the first examination, and 3492 the second (not counting repeat exams). The Fischer Paperback Library published the broadcast texts after the graduation examinations of both Model I and Model II; the lesson sheets were revised before being published in book form.

3.3 Model III, under the directorate of the Südwestfunk and the scientific supervision of Professor Heuser (Karlsruhe University) and Tillmann (Mainz University), was the two-term Funkkolleg in Mathematics (1970–1971). It consisted of 56 radio broadcasts of 30 minutes each, 11 lesson sheets, 1 special examination manual, and 2 assignment forms, 180 study groups of the Volkshochschulen (apart from university seminars, informal group study), and a considerably improved EDP system (2 assignments, 2 examinations). Of the almost 26 000 participants who registered for the first term, 17 000 reregistered for the second term. More than 8000 sat for the first examination, over 7000 for the second. A survey revealed that only 49% of the participants ever intended to sit for a certificate. 53% of the participants were school teachers, 12% pupils at secondary schools, 12% students; 20% attended group tutorials (teachers excepted); 3% were candidates for a certificate of proficiency needed for university entrance.

Model III is a consequential development of Model II and is of major organizational and didactical significance. Collaboration amongst all members of the research team (a staff of more than 20) was planned to the last detail and worked smoothly. Following a general discussion of the texts, the two teams of authors drafted manuscripts for broadcasts and lesson sheets. A point of discussion as to a "pilot medium" raised at various times, proved to be irrelevant for the Funkkolleg III; a system of didactical demarcation for each medium determined its didactical functions. The broadcasts were made radio-orientated by the use of narrators working to a fixed plan, instead of lecturers. The didactical integration of broadcast and lesson sheet was particularly close (dispensed with only on didactical grounds; the functions were divided between the media as follows: the broadcasts presented mathematical phenomena, the lesson sheets analysed and consolidated them).

Correspondence texts were designed to allow for phases of activity *during* broadcasts (during intervals, and with guidance from the "study guide speaker", the participants had to solve tasks and there were frequent video demonstrations, which were much appreciated according to students subsequently asked about them; etc.). A two-phase ancillary test (including drop-out analysis) is to give feedback on major didactical and thematical issues.

3.4 In the summer term of 1971 Model IV, under the directorate of the Hessischer Rundfunk and the scientific supervision of Professor Häuser (Frankfurt University), repeated the Funkkolleg Model I Economics term, first broadcast in 1967. The Land Bremen has participated in the Quadriga Funkkolleg Scheme since Model IV. The one-term Model IV does not really typify the Funkkollegs proper, nor does it represent a further development; the short time available for preparations – it was introduced at short notice while Model V was still being planned – as good as precluded full multi-media form with its implied didactical integration, radio orientation, and effective correspondence tuition. Though there were lesson sheets – in contrast to Model I – and the second half of each one-hour broadcast included a half-hour contrast programme to demonstrate controversial positions and their practical implications, the results of two surveys proved rather disappointing. Also there is much doubt about which potential participants to cater for, and about publicity. Critical comments on Funkkolleg IV are to be evaluated by scientific ancillary tests on the initiative of the Hessischer Rundfunk (via "Infratest" rating) and of the DIFF. 8247 participants enrolled; 4178 wrote assignments; the final examination was held on 25th September 1971.

3.5 The two-term Funkkolleg Model V on "Language – an Introduction to Modern Linguistics" is being held between September 1971 and July 1972 under the directorate of the Süddeutscher Rundfunk. Its didactical conception is based on an extension of Model III. Here considerable importance attaches to the perfection of

the feedback broadcasts; there are to be more of them and their radio presentation will be subject to further development. This latter aspect will receive special attention throughout Model V. The aim with regard to potential participants is to motivate students in particular and thereby explore the possibilities of this Funkkolleg model for undergraduates. Furthermore, the graduation course for teachers (German and all foreign language teachers, particularly those at continuing schools) will be given special attention. It should be interesting to learn how many participants belonging to other professional groups feel motivated. The specific problem with this model is that a mere modicum of language-orientated institutional courses with truly sound didactical structure is to be found at the Federal German universities; this means the Funkkolleg Working Committee must at the same time devote itself to the development of new curricula.

3.6 In the meantime, preparatory planning has begun on the two-term Funkkolleg VI on Educational Psychology under the directorate of the Hessischer Rundfunk. The opening broadcast is scheduled for September 1972. It many well prove an interesting didactical novelty: in an attempt to solve problems arising from the heterogeneity of the participants, an autodidactic section on Methods of Statistics is to be introduced beforehand and there will be more exacting additional texts for advanced participants.

4.

4.1 Thanks to the multiplying effect of the radio medium, a relatively large number of potential participants are reached by the Funkkolleg series of courses. No difficulties obtain to repeats by other broadcasting networks (presently Model II in Switzerland). Live copying on tape presents no technical problem, so that – with the aid of media libraries for example – even after the first network transmission has taken place, many of those studying can profit from the combined teaching system in their own homes, provided they apply themselves systematically to this individual mode of study. Here too it will be necessary to provide a form of group study.

4.2 The economic advantages of the Funkkollegs are more than obvious. The costs can be kept within perfectly reasonable limits, the more so as the broadcasting corporation can share them with other partners as well, and as the participants also contribute a reasonable amount. Another cost-saving factor is the combination of centralization and decentralization (centralized production of study materials, centralized broadcasting and distribution, but decentralized study groups, making use of the existing Volkshochschule organization).

4.3 Categories neglected by our system of educational policy are involved more easily by the Funkkolleg than by conventional teaching institutions. However, the system's traditional underdogs (Catholics, women, country people, those from smaller provincial towns) are still under-represented, though far less than is normally the case. As it happened, 1346 participants in Model I (approx. 10%) who had no university entrance qualifications, but were intent on academic study, passed the appropriate examinations in Hessen alone; 6% in Model II and 3% in Model III belong to this category (cf. Studien zur Bildungsforschung, Hessischer Rundfunk, Model I: Zum Verständnis der modernen Gesellschaft. Sozialwissenschaftliche Begleituntersuchung, Infratest München 1970. Also: Studien zur Bildungsforschung. Quadriga-Funkkolleg Mathematik. Berichtsband. Infratest München 1970). It will be seen that correspondence tuition cannot cross the educational barriers at the first attempt, that publicity will have to produce new ideas on this problem. The most urgent task ahead is to adapt further both the thematical contents and didactical lay-outs of printed study materials to the needs of that category. The problem of stratification arising here might bear on future Funkkolleg projects with telling effect.

4.4 The acceptance of scientific and didactical innovations is more easily promoted by means of the Funkkolleg Scheme than by other educational provisions. None but didactically sound courses which lend themselves to curricular revision, are suitable for correspondence tuition combined with audio-visual aids; Funkkolleg schemes of a low scientific and didactical standard are soon exposed. New lines of study, new didactical methods (e.g. Linguistics, "New Mathematics", Integrated Natural Sciences) are most likely to find acceptance with the sections of the population aimed at, as can be seen by the number of Funkkolleg participants and by the certificates obtained. The further development of didactical models for adult education, for integrating theory and practice, for effective measures concerning enrichment programmes for teaching staff, etc., is greatly helped by the large-scale experiments of the Funkkolleg projects, and by the ancillary tests. Certain trends in the structural composition of participating categories prove that undergraduates too can no longer resist the attraction of the Funkkolleg Scheme.

4.5 Sandwich course programmes in the group have particularly benefited from the flexible pacemaker function of sound radio networks (a fixed transmission schedule which, however, includes as many alternative programmes per week as possible, and other facilities such as listening to two broadcasts in one session, or separately on two different days). An effective counterbalance to this relatively rigid programme schedule is the accompanying lesson sheet for the individual use of participants. The drop-out problem will be more acute in the case of individualized teaching programmes. It might be less so, if circumstances allow the working schedule to be reduced to a minimum. And once the media libraries become available, a suitable lending procedure might well contribute to preserving this working schedule at least in part.

5.

5.1 One Funkkolleg problem difficult to solve is the transparency of criteria governing the Funkkolleg choice of subjects, potential participant analysis, study aims and objectives, study texts. It is not only hard for the Funkkolleg staff to solve, it also continues to apply to *all* curricular developments.

The principle that all partners of the Quadriga Planning Committee have equal powers, enjoy full independenc in carrying out their specific tasks, and are responsible only to themselves, was the productive element right from the beginning. But this principle also has flaws. As yet there are no representatives from the universities (they will only be represented as from Model V), or delegates of the participants (who is to select them by which procedure in what numbers?); furthermore, insufficient representation through their regional associations is a source of concern to individual Volkshochschulen, for it is they who are most affected by the direct contact with participants and by their pressing demands (the study groups are optional in the coming model and therefore not fully integrated). The "one-man-one-function" maxim of the first Funkkolleg terms has been progressively replaced by a plurality of scientific appointments and principles. Model II already appeared more stratified than some critics of the "Klafki crew" were prepared to admit; thanks to a realistic time schedule, the mathematicians of the Federal Republic were almost unanimous in their approval of the overall conceptual lay-out of Model III; though a reversal of this trend is observed in Model IV, there was evidence of at least one attempt to achieve plurality by means of the contrast programme.

In contrast to earlier models, the research teams are no longer lead by a scientific director, but by scientific co-ordinators who act more in the sense of arbitrators and moderators. The co-ordinators, authors, and the specialists in the field of multi-media and correspondence tuition have absolutely equal rights; no issue is

resolved until a consensus of opinion is reached amongst them. A more methodical structure of the experimental phases prior to the conclusion of a development is to give feedback on potential participants. The Planning Committee is not entitled to intervene in scientific and didactical issues of a specialized nature. Scientific publications and ancillary tests, also well balanced examination procedures, serve to produce unbiassed findings and evaluations which are open to public scrutiny.

Despite all efforts to solve these problems there is still cause for concern; empirical qualifications are lacking, although they are vital if the obstacles in the way of establishing suitable study aims are to be overcome; rather more attention is paid to the social relevancy of particular fields of science and the idea of co-opting representatives of individual courses is at the moment very topical (most marked in Model III and IV); but an altogether satisfactory solution cannot emerge unless the curricula are subjected to large-scale development and evaluation in the not too distant future. The Funkkolleg projects by themselves, in isolation from the groups concerned with the development of curricula und educational reform, are incapable of bringing about curricular revisions, and will inevitably be confined to beginnings.

5.2 The co-operative model already referred to above, has been and still is being developed gradually and painfully, but all things considered, now operates well enough. With different partners working together it is imperative that there should be clear ideas about the part each of them plays, and about their limitations. This has only been the case since Model III, when all important questions were resolved by mutual consent.

Co-operation costs time. At least 18 months, if not two years of planning and developing, are required for a Funkkolleg. Nothing like that was available for the early models. Only since Model V and VI has there been more breathing space for planning.

A particular problem is the composition of the Funkkolleg research teams. If the preparatory planning team is too large, the project may be wrecked simply because the members can never be assembled at one and the same time; if it is too small, important viewpoints may be totally lacking in the conceptual planning programme. Even more acute is the question as to who is to select the members of the preparatory planning staff and other research teams (cf. also under 5.1). Formally the Planning Committee is competent here, by virtue of its social stratification and by the fact that, as time goes on, its members are becoming more and more qualified; but can the Planning Committee possess sufficient specialized knowledge to be able to avoid having to follow in the wake of individual groups, with their specific objectives? Only by making decisions as precise and clear-cut as possible can this be avoided. The progressive development of the models proves that the administrators have fully understood this problem.

The relationship between the research teams and the Planning Committee, mainly the demarcation of their competences, are also the subject of further discussion. What is to happen in the case of conflicting views on potential participants (with the broadcasting networks aiming at wide-spread dissemination, and the research teams at specialization and concentration), or on early-stage decisions on study aims, etc.? In this and similar cases the appointed scientific co-ordinators are proving their worth; they are well able to play the role of an arbitration board.

Nor must the organizational problems be overlooked. Since Model III the planning and developmental phases have been much to the fore, and progressively more effective; since Model V there have been broadcasting and editorial plan-

ning schedules intended to ensure the smoothest possible co-operation (though the best programme schedule can never safeguard against unpunctual authors). Only since Model V has it been possible to fit the members of the examination board under one "organizational hat", so that future pitfalls in this area can be avoided. At present though it would be foolish to call a co-operative model of such complexity ideal; but taken in all, it represents an acceptable gambit for further moves.

5.3 What has been changed most over the years is the didactical lay-out of the different models. While sound radio networks stretched themselves almost to the limit to take over the Model I functions in competition with the group tutor, the printed materials, posted sporadically, amounted to hardly more than enrichment material (the Fischer paperbacks of the radio texts were only published after the end of the term). The few groups that existed, carried little weight. Yet Model II could already be called a combined teaching system, for it was based on a combination of various media and study methods, each with specific functions and varying amounts of study. It could not be fuller realized due to lack of time and experience. But Model III turned the tide (cf. 3.3); Model V will lean more on combined teaching systems, with even closer didactical integration.

The heterogeneity of the potential participants will remain a problem to the Funkkolleg Scheme, as long as the view is taken that heterogeneity must be preserved for reasons connected with our general educational policy, and with the charters of the broadcasting corporations. This heterogeneity, however, posed practically no problems in the case of Model I, whose participants were almost exclusively school teachers. They did not have a monopoly in Model II, but the common bond — professional teaching, or a general interest in education — proved remarkably strong. Major difficulties, even more acute than had been expected, were first noted in Model III. The marginal groups (parents; generally interested persons) dropped out almost completely within a short time; students and even A-level pupils found the standards too low; teachers, those teaching O-levels in particular, found them too high. Whereas pupils, students and group study participants (teachers excepted) were reasonably satified with the overall lay-out, severe criticism came from the teachers, who missed a didactical catalyzer for converting the subject matter for use in school. It was only on rare occasions that the study groups managed to solve the problem of stratification discussed above. A practical solution might finally be provided by Model VI which incorporates preparatory and continuing study materials. In the future the Funkkolleg projects may have to add more variety to their educational provisions.

The purpose of these deliberations on the sector Funkkolleg is to stimulate more discussion than hitherto on combined correspondence and multi-media systems. The very fact that the Funkkollegs have become an "institution", that they are doing more for the promotion of correspondence study in Federal Germany than a number of other projects, makes it imperative to take an even greater interest in them. It would certainly be desirable for universities to show their interest in them in scientific ancillary tests and critical analysis.

There is perhaps one more point worth raising in this context: those responsible for the Funkkolleg Scheme did not choose to wait until all the fundamental problems had been analysed or solved, but used the more vulnerable strategy of doing the practical thing, welcoming critical attention as a kind of constant ancillary test of the scheme in action. This was the only way of getting actively involved in educational policy (approx. 51 000 participants registered for Models I–IV), of gaining experience from large-scale experiments, and of implanting the idea of

Funkkolleg schemes in the minds of potential participants. This means that in order to arrive at fair conclusions about individual Funkkolleg projects, they must be considered in the light of the evolution of the Funkkolleg concept as a whole. It is to this end that these notes have been written.

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The Quadriga-Funkkolleg in Pedagogy

The Quadriga-Funkkolleg in Pedagogy, an educational institution with courses lasting for two semi-annual terms, was established on April 28, 1969 thanks to the combination of various factors:

1. *the overall educational and political situation* prevailing in the Federal Republic of Germany during this decade;
2. *the experience made by Hessischer Rundfunk* in the preceding Model I of Funkkolleg "On understanding modern society", and the initiative of Professor Kadelbach, head of the central Department of Education and Training at Hessicher Rundfunk;
3. *the willingness of the pedagogic director of* Model II of Funkkolleg in Pedagogy, Professor Wolfgang Klafki, professor-in-ordinary at the Educational Research Institute of Marburg University, and a group of university professors, to accept the difficult task of providing an introduction to pedagogics;

   (authors: Hans-Karl Beckmann, Jürgen Diederich, Reinhold Freudenstein, Gerd Iben, Wolfgang Klafki, Karl-Christoph Lingelbach, Georg M. Rückriem, Willi Wolf)
4. *the great interest shown by the Deutsches Institut für Fernstudien* (German Institute for Remote Studies) at Tübingen University (principal: Professor Günther Dohmen) — which is supported by the Volkswagenwerk Foundation — in testing and studying a model of a multi-media remote study course within the framework of a comprehensive experiment, and in taking over the development and publication of the "Studien-Begleitbriefe" (letters accompanying the study courses);

   (The editors and co-authors of these letters in co-operation with the above-mentioned authors and the Institute for Remote Studies at Tübingen University were: Hansjoerg Finckh, Horst Hoffbauer, Hildegard Müller-Kohlenberg, Helge Peter; advisors: Otto Peters, Karlheinz Rebel).
5. *the positive approach of the German "Volkshochschulen"* (schools of adult education), and their willingness to establish study groups for the voluntary direct teaching phase;
6. *the agreement of the Ministers for Culture and Education* to acknowledge the certificates awarded by Quadriga-Funkkolleg in Pedagogy;
7. *the advanced stage of research reached by the co-ordination, at the Baden-Württemberg Ministry of Culture and Education in Stuttgart,* which made it possible to evaluate homework and examination papers in large numbers;
8. *the demand for information, and the desire for knowledge or advancement characterizing the 12 100 participants,* and the willingness with which the collaborators, assistants, advisors, and institutions not named here went about their work.

1. *The Overall Educational and Political Situation*

The fact that a very large number of people participated in Quadriga-Funkkolleg in Pedagogy can be explained only by the educational and political background currently prevailing in the Federal Republic of Germany. Gerd Kadelbach[1]) has described this situation in a very appropriate way:

[1]) *Kadelbach, G.,* Das Quadriga-Funkkolleg Erziehungswissenschaft als Modell der multimedialen Erwachsenenbildung (Quadriga-Funkkolleg in Pedagogy as a Model of Multimedia Adult Education), Part 1: Demokratisierung, Objektivierung und Partizipation als Impulse für ein Fernstudium im Medienverbund (Democratization, Objectivation, and Participation as Impules for Remote Study within a Media Compound). Published in: IBM Nachrichten 202, 20th year, Sindelfingen near Stuttgart: IBM Deutschland 1970, page 300—306.

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"Basically speaking, the educational and political demands of the reformers and the impatient cries of pupils and students in the Federal Republic of Germany can be expressed by three words: democratization, objectivation, and co-determination. The last of these terms should be replaced by the word 'participation' — which became well-known during the May revolts in France — as 'co-determination' is used in many different ways, for example in the field of labour and employment rights.

In this connection, 'democratization' relates to the elimination of education barriers opposing above all people living in rural areas, the children of workers' families, girls, and members of the Catholic church in Germany — as has been shown by a study carried out by Karl Erlinghagen. The principal aspects of this important demand, which society must fulfil, are to eliminate the underprivileged status of a large sector of our population so that they can exploit all of the educational possibilities available, i.e. 'education as a right of the citizen', and 'equal possibilities for everybody'. In addition, the elimination of information barriers — which from pre-school age upwards due to a very different linguistic nomenclature — is also necessary before education can become a democratic institution.

Objectivation is linked very closely with the present method of teaching employed by our schools and universities — this method still being based very strongly on authoritative principles: the authority of the staff and the subject matter presented must be revised. Plurality must be respected in the field of education as well, and the contrapuntal theory and controversial opinions must be taken into consideration and integrated in a satisfactory way. These demands shake the roots of the 'established' educational facilities, which stem from old traditions and are supported by our legislation.

It is here that the greatest difficulties still have to be overcome. True, attempts at changing the situation have been made, but they have not yet led to any significant success. Examinations, their application and their importance are a very problematic factor accompanying the authoritative school system (i.e. the normal or "average" school) and the university system. Examinations are subjective to a very high degree and make examinees directly dependent on the examiner — even if they are not consciously aware of this condition. The inevitable consequences for a school supporting the conventional system and in this way the realization of a somewhat dubious situation are adaptation, resistance, affirmation and uncritical approval instead of the ability to view something from a distance and to be critical.

The term 'participation' is connected mainly with new findings on the relevance of group dynamics. The frequently used alibi of 'co-responsibility of pupils' must be interpreted as an attempt made by traditionally-minded persons — who do not want to introduce any changes — at defending the present system. Group pedagogics is more than just the external application of organizatory changes and findings such as a new arrangement of chairs and desks and the partners' personal relationships to each other. Rather, it is an extremely dramatic procedure dealing with changes in the subject matter taught and the persons having to do with this subject matter. This does of course require, among other things, a new scholastic structure eliminating the conventional barriers imposed by classes and grades, the introduction of a general permeability of educational facilities, and the application of the tutor system in university didactics and adult education. Effective group work — which is in turn necessary for making participation possible — is not conceivable in any other way.

This analysis inevitably results in new focus points for the structure of our educational system. These focus points are centred on the enlargement of nurseries and

pre-school facilities, which will do away with informational barriers, and on the provision of equal possibilities for everybody during the years of their life when social alternations for the future can be made . . .

Another important factor is to introduce a system of refresher studies, which up till now has only been put down in writting by the "Wissenschaftsrat" (central council responsible for the planning and development of German universities) and must be realized as soon as possible. Such refresher studies do not only help in relativating theory by means of practical application and in making the interdependencies clear towards which practice is orientated, but above all serve to release students — tied to the teaching authority imposed onto them by the university — from the system of blindly following their teachers, to place a subsequent focus on the controversial aspects of studying, and thus to eliminate the state of paralysis induced by the authority-orientated hierarchy dominating at universities. It is only in this way that detachment and a critical approach are rendered possible, that purely affirmative behaviour is reduced, and that the independence of the individual can be "promoted" — to quote Johann Gottfried Herder in this context. Therefore, when speaking of objectivation, the demand for refresher studies must be fulfilled... These steps can only be taken within a group, in a 'collective' among equal partners having the ability to participate in a discussion and to convert the results of such discussion into 'action'. Simultaneously, action refers to the identity of 'knowledge' and 'activity', and means the 'appropriate behaviour' as stated in the definition of education provided in the report of the German Board on the Situation and Tasks of Adult Education."

2. *The Experience Made by Hessischer Rundfunk in Model I of Funkkolleg*

From 1967 to 1969 Hessischer Rundfunk broadcast the first model of a Funkkolleg (one semi-annual term each in economics, politics, law, history, and sociology).

The desire to organize a remote study concept within a media compound, in which the printed accompanying material is geared didactically to the radio broadcasts, resulted from a factor which led to the following development in the course of that first Funkkolleg:

The subject matter presented in the broadcasts was supplemented by accompanying material and one-third of the participants attended classes, group meetings, and lectures organized by various institutes of adult education, so as to intensify their knowledge and exchange thoughts and opinions personally. Before a participant was allowed to take an examination for a certificate, he had to do some written homework. (These examinations were held at the end of each term and were made up of a written and an oral part.)

The *new aspect* of Model II, i.e. the Quadriga-Funkkolleg in Pedagogy, is the media compound which has been planned and applied with greatest care. This compound is characterized by the following factors:

2. 1 the concept of "Kolleg" lessons produced by a *team of experts* under Professor Wolfgang Klafki (these are radio programmes lasting 60 minutes each);

2. 2 *the didactical letters accompanying the studies* prepared in co-operation with the authors of the "Kolleg" lessons under the responsibility of the German Institute for Remote Studies at Tübingen University;

2. 3 the evaluation of the homework and examinations, effected *by means of electronic data processing.*

3. *The Concept of Professor Wolfgang Klafki, the Pedagogical Director of Quadriga-Funkkolleg in Pedagogy, and his Team: The Objectives, Contents, and Methodological Structure of the Introduction to Pedagogy.*

The decision made by the pedagogical director of Funkkolleg not to produce the "Kolleg" lessons alone, but rather to have them planned ond discussed by a group of university teachers in weekly teamwork, and to have the drafts of these lessons checked on the basis of various aspects, complies with the concept of regarding objectives and methods within the framework of an unchangeable inter-relationship.

The reasons for this procedure have been explained by Wolfgang Klafki[2]) in his description of the aims of Quadriga-Funkkolleg in Pedagogy:

"Our intention was to convey to our listeners in a systematic way various impulses for reflection as well as essential and extendable findings and information arousing a desire among the listeners to supplement and enlarge their knowledge, this being an aid to attaining a more critical and educative consciousness. Or, to put this in other words: We were concerned primarily with aids for developing an emancipated consciousness on the part of our listeners, that is a consciousness querying in a critical manner outdated pedagogical ideas, institutions, standards, contents, and procedures. We were likewise concerned with aids for providing an introduction to these findings and methods with the help of which it is definitely — or at least presumably — possible to alter or improve current pedagogical institutions and common educational habits by means of a carefully planned and supervised approach. In order to reach this aim it was necessary to discuss and re-discuss the more general, political, public, economic and/or cultural contexts, in which the pedagogical institutions and practices, as well as all the attempts made at changing them, are imbedded.

Accordingly, we did not regard pedagogics as a discipline which merely describes prevailing conditions and crystallizes possible formal rules and principles — e.g. in learning processes or within the structure of pedagogical institutions.

Within the framework of Funkkolleg we rather considered pedagogics to be a critical discipline in itself. In the present case this means (1) a discipline in which those standards, guiding concepts, interests, and possibly also ideologies are constantly reflected on, which are conveyed by history and society and which can or might be the background for outdated pedagogical institutions and practices, and (2) a displine attempting not only to investigate methodically the requirements, possibilities, and means of changing the institutions and procedures of educational practice, but also to conduct the fundamental process of providing new objectives and decisions as far as possible on the basis of rational argumentation, and to place an influence on altering and improving pedagogical practice in this respect, too."

In the same paper Wolfgang Klafki[3]) describes the difficulties arising when giving an introduction to pedagogics:

3.1 "Before Funkkolleg was started no comprehensive attempt had been made at "presenting an illustrative introduction" to pedagogics in line with our present knowledge and stage of discussion."

3.2 "In the course of the last 10 to 15 years pedagogics has developed very intensively in Germany. The questions raised by pedagogics, the methods used, the framework of research have expanded and changed a great deal."

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[2]) *Klafki, W.*, Zielsetzung, inhaltlicher und methodischer Aufbau des Quadriga-Funkkollegs Erziehungswissenschaft (The Objectives, Contents, and Methodological Structure of Quadriga-Funkkolleg in Pedagogy). Published in: IBM Nachrichten 202, 20th year, Sindelfingen near Stuttgart: IBM Deutschland, 1970, page 307 to 312.

[3]) loc. cit., page 307 f.

In the case of the changes which have resulted in the field of pedagogics, W. Klafki has observed the following four aspects:

3.2.1 The strong accentuation of the question posed by modern pedagogics, induced especially by the connections between pedagogics, sociology and political science, so that pedagogical institutions and pedagogical processes can be examined to an increasing extent in the light of their relationship to comprehensive systems and procedures of politics and society.

3.2.2 Pedagogics is about to include the so-called specialized and individual arts in its framework, for example in the field of didactical research and planning when teaching modern languages.

3.2.3 The third aspect relates to the extension and re-structurization of methods:

"... to adopt and develop so-called 'empirical' research methods ..., and in addition to endeavour to make the so-called *historical* and *hermeneutical (textual) methods* more precise and develop them further ... Within the framework of historical-hermeneutical methods the most significant development is probably that the critical ideological perspective ... is taken seriously, i.e. the necessity to query each and every pedagogic institution, trend, statement, and publication to the effect whether — and if so, which — interests and requirements of society are expressed hereby and which relevant consequences among society could arise herefrom."

3.2.4 The fourth aspect is to establish contacts between pedagogical research in Germany and the work done on an international level.

3.3 As regards the *structure* of the Funkkolleg contents[4]), three factors were taken into consideration, which have various influences on each other:

3.3.1 "What are the principal *questions* posed by pedagogics and what are the *basic terms*, and in what connection do these questions and basic terms arise?

3.3.2 What *methods* are applied by pedagogics in attempting to solve these questions?

3.3.3 What *subject category* does methodical research relate to within the framework of these principal questions and under the application of these basic terms?"

3.4 The fourth difficulty[5]) arose in conjunction with the question as to how contents are to be arranged in view of their mutual influence, as each of the three elements is comprehensible only within the overall context. As it was impossible for lack of time to run the planned contents again, the mutual influence of the three elements was made clear with the help of references made at short intervals.

All in all, a breakdown was effected into the following sections having a total of 40 "Kolleg" lessons[6]) (i.e. 40 radio broadcasts, including discussion and one discussion class):

3.4.1 Introductory section: A look at the principal questions posed by pedagogics (one "Kolleg" lesson)

3.4.2 Inter-personal relations (four "Kolleg" lessons)

3.4.3 Institutions (five "Kolleg" lessons)

3.4.4 The position of pedagogics within society (three "Kolleg" lessons)

3.4.5 The standards and objectives of pedagogics (two "Kolleg" lessons)

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[4]) loc. cit., page 309 ff.

[5]) loc. cit., page 309 ff.

[6]) loc. cit., page 310 f.

3. 4. 6 The contents of learning and teaching (three "Kolleg" lessons)
3. 4. 7 The methods of teaching and pedagogics (four "Kolleg" lessons)
3. 4. 8 Modern methods as a task to be realized by pedagogics (three "Kolleg" lessons)
3. 4. 9 Anthropological-psychological requirements in pedagogics (four "Kolleg" lessons)
3. 4. 10 Research methods in pedagogics (five "Kolleg" lessons)
3. 4. 11 The relation between theory and practice in pedagogics (two "Kolleg" lessons)
3. 4. 12 Pedagogics and its fields of application (one "Kolleg" lesson)
3. 4. 13 Final section: A retrospective look at the structure of Funkkolleg in Pedagogy and comments on some basic questions concering self-study of pedagogics (one "Kolleg" lesson)

3. 5 The specific nature of pedagogics is regarded in the following way by the team of Funkkolleg: "We consider pedagogics to be a discipline relating to the practice of education, critically examining this practice and — in view of reflected valuation criteria such as 'emancipation' and 'democratization' — aiming at improving and altering education. In other words: We regard it as a *critical* theory[7])."

3. 6 The individual lecture sessions, the length of which (one hour) could not be reduced for organizatory reasons, are made up of *eight methodical elements* as follows[8]):

3. 6. 1 "Lectures given by a member of the team, some of which include elements for activating the participants such as instructions telling them to take notes on various models, to draw up charts, etc.;
3. 6. 2 Long or short quotation passages integrated into the lectures and spoken by a radio announcer, sometimes providing a contrasting change to the preceding text;
3. 6. 3 Integrated information passages, for example on a certain pedagogical trend, on the definition of terms, also spoken by a radio announcer;
3. 6. 4 Study scenes: pedagogical situation as a basis for presenting and illustrating theoretical analyses or as an illustration of the argumentation put forward beforehand;
3. 6. 5 Analysis of the study scenes by individual members of the team, or by several members simultaneously;
3. 6. 6 Statements made by individual team members on specific questions during or following a lecture;
3. 6. 7 Discussions between the team members either during or following a lecture or a statement;
3. 6. 8 Short interludes of music as a break between presentations.

4. *The Methodological Organization of the Multi-Media Compound and a Few Problems Encountered when Preparing the Letters Accompanying the Studies*

4. 1 *The methodological organization of the multi-media compound*

The following media were available to the Funkkolleg in Pedagogy model for realizing the objectives and contents:

4. 1. 1 *Radio broadcasting facilities* for 40 "Kolleg" lessons broadcast twice a week in the regions covered by the four stations grouped in "Quadriga", viz. Hessischer Rundfunk, Saarländischer Rundfunk, Süddeutscher Rundfunk, and Südwestdeutscher Rundfunk.

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[7]) loc. cit., page 312.
[8]) loc. cit., page 312

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4.1.2 *Eight letters accompanying the studies* in DIN A 4 format (German standard), providing printed texts and pictures. On an average, each "letter" has 80 pages and presents the printed accompanying material for five lessons.

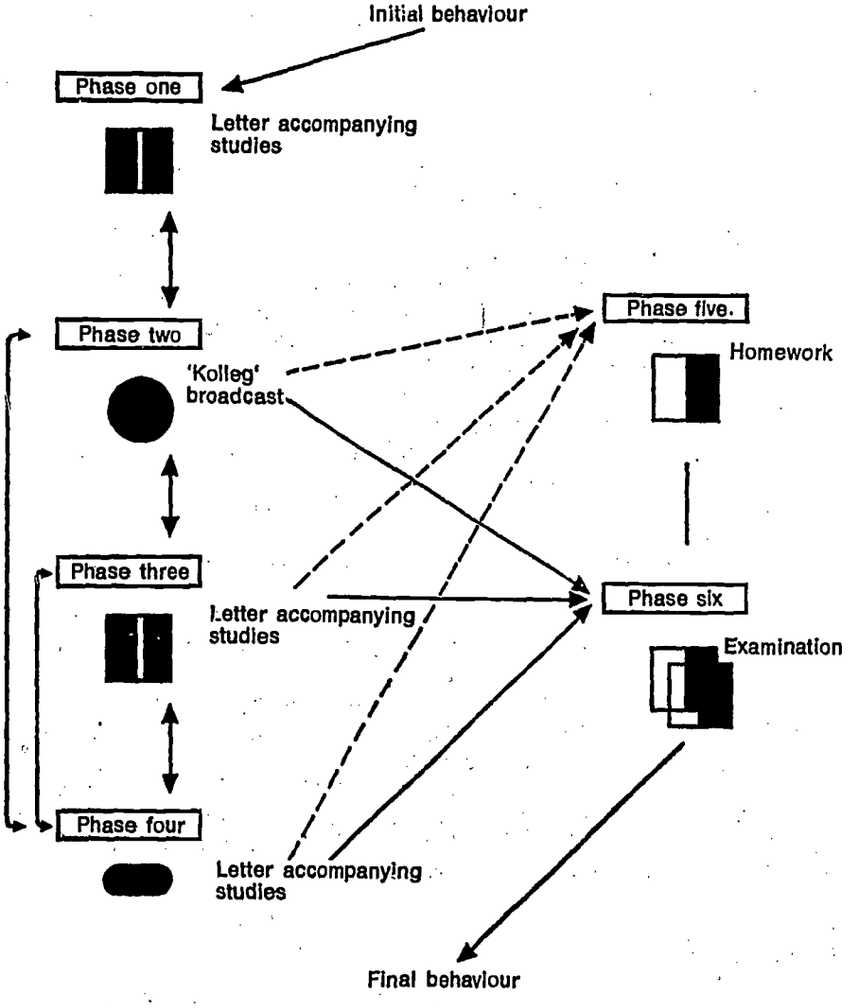
4.1.3 *Study groups.* Normally, there was one working session a week lasting two hours each time and organized by the "Volkshochschulen" (adult education schools). Participation in these study groups was voluntary.

4.1.4 *Homework.* Printed worksheets for one homework session during each of the two semi-annual terms.

4.1.5 *Examinations.* Printed worksheets for one examination during each of the two terms. The examinations lasted for two hours each.

The homework and examinations were evaluated *with the help of electronic data processing.*

4.2 The following chart[9]) shows *the sequence* in which the learning process "normally" takes place in phases 1—4 of each of the 40 "Kolleg" lessons. The feedback and ramified sections indicate how, in each phase, information can be taken from the media applied in the other learning phases. This applies especially to the summarizing check-up phases 5 and 6, which consist of the two components homework and examinations.



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4. 3 *Some problems encountered when preparing the accompanying letters*

Mr. Karlheinz Rebel, the Vice Principal of the German Institute for Remote Studies at Tübingen University, made some relevant comments on the difficulties encountered when preparing the letters accompanying the studies[10]):

"The only forerunners of the study letters accompanying Quadriga-Funkkolleg were the study letters used by the German Institute for Remote Studies which, however, had been developed in full only for one subject, viz. English, and could thus not simply be transposed to the Funkkolleg model. The accompanying letters for English and approximately 20 other correspondence courses, most of which were of foreign origin, were analysed by the author of this report, so as to gain some experience on formal elements and the possibilities of didactical, methodological, and graphical structure. Next, the accompanying letters were developed after lengthy discussions with the authors and the publisher. It proved possible to maintain the basic concept of the study letters throughout the entire Funkkolleg. Only details were altered to a certain extent on account of the numerous letters sent in by participants, who, incidentally, were quite willing to accept our request for cooperation. It can nevertheless not be claimed that this mastered to a satisfactory degree the formal aspect of preparing accompanying letters. There was not enough time and staff available to carry out research on the problems relating to the specific effects of the various media, the redundance of the teaching contents in the accompanying letters, the influence charts and other illustrative aids have on learning success, the appropriate style to be applied for accompanying letters, etc. Although the students gave mainly positive answers when asked what they thought about Funkkolleg, this favourable response does not replace the research projects mentioned in the foregoing sentence and, above all, cannot serve as a substitute for rapid and economic feedback from the students to the German Institute for Remote Studies.

An even greater drawback resulted from the fact that — again due to lack of time, a shortage of staff, and insufficient research on media-didactics — it was not possible to effect the didactical integration of the broadcasts and the accompanying letters as planned in the original model, and as is now done in the current Fukkolleg on mathematics. It is not simply a matter of repeating parts of the radio programmes in written material, or — to take the other extreme — of writing an independent text according to conventional methods, not geared to the problems and examples presented in the programmes. Rather, the decisive criterion should be the correct breakdown of functions between both of these media. When having a critical look at the individual study letters used in Funkkolleg in Pedagogy and when examining this breakdown aspect, it will become clear to the observer in how many different ways and, basically speaking, with what arbitrary methods it was attempted to solve the integration problems by means of the programmes, and how distinct the trend is towards increasingly comprehensive accompanying letters. This did not only lead to substantial unforeseen expenditure on the part of the German Institute for Remote Studies, but also forced the students to spend much more time on their studies than had been planned originally.

9) Quoted from *Hoffbauer, H.* Die Studienbegleitzirkel des Funkkollegs Erziehungswissenschaft (The Study of Funkkolleg in Pedagogy). Published in: Film Bild Ton — A journal on audio-visual media applied in the field of pedagogics, 20th year, issue No. 9. Munich: Heering 1970, page 25.

10) *Rebel, K.* Das Quadriga-Funkkolleg Erziehungswissenschaft als Modell der multimedialen Erwachsenenbildung (The Quadriga-Funkkolleg in Pedagogy as a model multi-media adult education), Part III: Probleme bei der Erstellung des Begleitmaterials zu Funkkollegs (Problems encountered when preparing the material accompanying Funkkolleg). Published in: IBM 203, 20th year, Sindelfingen near Stuttgart: IBM Deutschland 1970, page 390—392.

In the case of Funkkolleg on mathematics, which followed Funkkolleg in Pedagogy, the appropriate consequences were drawn from these difficulties — the increase of learning and experience on the part of the bodies concerned being one of the most significant assets of Quadriga-Funkkolleg."

4. 3. 1 *The structure of the study letters*

The structure of the letters accompanying the studies follows from the didactical function they are to have within the framework of the media compound and from the nature of the "printed study material" medium as such. The nature and functions of this medium can — in brief — be classified as follows:

The study letters are a printed mass media with texts and pictures. Their aim is to present visually a system of highly organized teaching material based on aspects of learning psychology, enabling students to proceed according to autodidactical methods with various aids and checking facilities. They are the main unit within the phase of individual learning and are intended to help the students to understand the "Kolleg" lessons better, to facilitate their follow-up work, to provide possibilities of repetition, to offer a possibility of studying at any time, to avoid the necessity of taking notes in the "Kolleg" lessons, to encourage discussions in the study groups, and to help the students continue their studies independently.

The printed study material contains the following *structural elements*, making it possible to realize these functions:

the breakdown of the "Kolleg" lessons;

aids for guided self-study, such as hints for solving tasks or explanatory notes on charts, etc.;

a clear breakdown of texts, pictures, and charts into rough and fine elements, easy to understand for the students;

a numerical system for the individual sections (according to German industrial standard DIN 1421), making rapid orientation possible;

the notes made in the wide margin, intended to direct the reader's attention to the significance of a certain passage within the overall context, such as "initial situation", "summary", etc.;

tasks and problems for the purpose of self-control with solutions and comments provided in the appendix;

a glossary in the appendix, enabling students to look up important terms;

bibliographical notes on fundamental and further literature;

suggestions for the work done in the study groups.

5. *The Study Groups*

One-third of the students attended one of the 86 study groups[11]).

5. 1 The study groups constitute the *voluntary direct phase of Funkkolleg*. Among other things, they have the following *functions*[12]):

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[11]) The author thanks the following press publications for providing these figures: *Vogt, G.:* Erziehungswissenschaft im Radio — (Pedagogics on the radio) — The Funkkolleg of the Quadriga institutes has been completed successfully. Published in: Handelsblatt — Deutsche Wirtschaftszeitung — Industriekurier on July 15, 1970.

[12]) *Hoffbauer, H.*, loc. cit., page 25—32.

"Direct meetings in small groups. Provision of a facility to learn on a social basis. Also: Follow-up work and mental "processing" of the "Kolleg" lessons. Two-way communication with instant response. It is also possible to make allowance for socio-pedagogical considerations. Fixed location. The success of the study groups depends very greatly on the group leader's qualifications as regards the subject concerned and his pedagogic abilities. The structure of the group is also important. The group leader must be able to establish a suitable relation between the objectivated expectations of the teachers and the initiatives and needs of his group. With its open and unrestricted system (which distinguishes it from the "closed" system of the other two media), the study group — as part of the media compound — fulfils a supplementary function which is difficult to foresee in its effects, hard to compare, and problematic in many ways. The number of participants is limited. The information conveyed by non-personal mass media is personalized (re-personalization). In this way it is possible to meet the students' need for communication and contacts.

5. 2 *The principal media-specific objective:* The principal objective of the study groups was to intensify the students' crtical consciousness by suitable discussions dealing above all with the educational problems of self-determination, of democratization, and of emancipation (this being the most difficult task of the study group). The study groups constitute the social phase of learning. Application of pedagogic aids and follow-up aids, e.g. for motivating learning, for overcoming learning difficulties when solving tasks, for checking the material already acquired, for making the material more concrete, and for applying and arranging the material acquired within more comprehensive contexts. The verbal and communicative training which results from discussions is not only suited for conveying security to a person when presenting his own critical viewpoints and for making him more tolerant, but can also be regarded as a kind of probation and trial action.

5. 3 Basically speaking, the study groups involved here *require different qualities from the group leaders and participants*, as compared with most of the courses run so far by German "Volkshochschulen" (adult education schools). Hitherto, the teacher in a course was usually the only person knowing the information to be conveyed. This is not the case in our study groups. Here, the participants have received the same information as the group leader through the "Kolleg" lessons and the study letters. This means that the work done by the study groups can, in principle, start at a higher level, viz. at the level of critical processing of the contents provided beforehand, these contents having been objectivated to a great extent. Nevertheless, this does make it necessary for the study letters to be handed over to the group leaders and participants in good time, which, unfortunately, was not always the case. The heterogeneous composition of the study groups on the one hand, and the strong professional and family ties of many participants on the other hand, made it necessary to do follow-up work on a number of essential points provided in the information conveyed, which does not however mean that this excluded the aspect of criticism.

5. 4 When summarizing the result of the other reflections and experience relating to the study groups of Funkkolleg, *the following important points* must be taken into consideration:

5. 4. 1 The formation of study groups as such, and the work done by them, depend primarily on the contents and teaching aims of Funkkolleg in Pedagogy. Wolfgang Klafki's team stated that the principal objective is to provide help in developing a critical consciousness towards pedagogics.

5. 4. 2 An instructional and technological media compound comprising the following elements (media) was applied for reaching these teaching aims with a student body of 11 810 participants: "Kolleg" lessons, study letters, study groups, homework, and examinations.

5. 4. 3 The study groups constituted phase 4 within a basic model of studies in a media compound made up of 6 phases.

5. 4. 4 The media-specific function of the study groups is evident in the possibilities of learning provided by the social phase of the learning process, the decisive factor being the provision of a suitable relationship between an open system and the application of objectivated teaching contents provided beforehand.

5. 4. 5 The study groups impose novel didactical requirements onto the group leaders and the participants, similar to the requirements to be fulfilled in the case of the tutorship work done at universities. This work starts out at a higher level: Basically speaking, it consists of confrontation — by way of dialogues — with the information assumed to be known to the participants, as they were given this information beforehand.

5. 4. 6 A number of opinions voiced by participants and the initial results of the empirical research accompanying Funkkolleg enable us to draw conclusions as to the conditions prevailing in the study groups and their effectiveness as a medium. In addition, it is possible in this way to put forward suggestions for improvement.

It must be assumed that the students who took part in a well-organized study group or a similar kind of formal or informal group work — in other words, in a medium making, thanks to its specific nature, critical treatment of the contents conveyed by Funkkolleg possible — had a better chance of reaching a critical consciousness on pedagogics."

6. *The Homework and Examinations*

6. 1 At the end of the first and second term the students were asked to do a homework session and to sit for an examination about eight weeks later.

The homework was intended (1) to prepare the students for the nature and degree of difficulty of the tasks set in the examinations, and (2) to enable the students to acquire the enrolment certificate after having successfully completed the homework and the examination following thereafter.

The planning, testing, and revision of the tasks set in the examinations, the execution of the examination as such, the evaluation of the results, the decisions as to grading and marking, and the notification of the students pertaining to the results achieved (this notification including the tasks and the correct solutions with comments), required close co-operation between the Marburg team, the collaborators of the German Institute for Remote Studies, the Central Office of Funkkolleg in Frankfurt, and the Co-ordination Office for Electronic Data Processing in Education at the Ministry for Education and Culture in Stuttgart, assisted by the IBM School Computer Centre in Stuttgart. The following *chart*[13]) shows the number of subscribers to the study letters, the number of students eligible to sit for the examinations (i.e. those having taken part in the homework sessions), the number of students who actually took the two examinations, the number of students who took the examination repeated at a later date, and the number of students who passed the examinations with a grade 1 (excellent) and a grade 2 (good), or who failed.

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[13]) This material was provided by the Central Office of Funkkolleg at the press conference held on July 7, 1970 at the Frankfurt Broadcasting House, under the chairmanship of Professor Gerd Kadelbach.

6. 2 *Quadriga-Funkkolleg in Pedagogy* (40 lectures)

1 Number of students bindingly enrolled on May 1, 1969 = 13 495 (without seminars*, which had about 2 000 participants)

	First term	*Second term*	*Total*
2 Subscribers to the study letters (as quoted by the publisher)	12 100	9 350	—
3 Students eligible to sit for the examinations (i.e. having done homework)	5 977	4 048	10 025
4 Number of students taking exams	3 722 = 64 % (1rst ex.)	3 492 (2nd ex.) = 86 % (of eligible students)	7 214
5 Students taking exams at a later date	103 = 2.7 %	71 = 2 %	174
Total from (4) and (5)	3 825	3 563	7 388
6 Grade 1 (from (4) and (5))	561 = 15.7 %	785 = 22.5 %	1 346
7 Grade 2 (from (4) and (5))	1 951 = 53 %	1 752 = 50 %	3 703
8 Students failing exams (from (4) and (5))	4 = 0.02 %	56 = 1.07 %	60

*) No exact results can be provided on the seminar exams.

6. 3 In the case of *examinations involving a large number of participants*, which are to be conducted with the help of electronic data processing, certain forms of *setting the tasks* must be applied, as computers are only able to "read" solutions written in the form of figures or symbols. In Funkkolleg in Pedagogy the students entered these figures on a marking sheet. Part of such a marking sheet is shown under 6. 4, 2.

Essentially, four different *types of tasks*[14]) can be applied, depending on the purpose and contents of the respective problem:

6. 3. 1 Alternative answers: (yes or no, right or wrong)

6. 3. 2 Simple or multiple choice answers (one or several correct answers must be marked with a cross, out of a number of possibilities provided in a certain question)

6. 3. 3 Re-arrangement or allocation tasks (several statements, data, or facts must be arranged in the correct sequence or combination, as prescribed by the respective question)

6. 3. 4 Tasks made up of a combination of the three types shown above.

[14]) Cf. *Gross, M., Allinger, U., Busch, H.-G., Rütter, Th.:* Das Quadriga-Funkkolleg Erziehungswissenschaft als Modell der multi-medialen Erwachsenenbildung, Teil 4 (Quadriga-Funkkolleg in Pedagogy as a model of multi-media adult education), Part 4: Computerunterstützte Prüfung für ein Fernstudium im Medienverbund (Computer-supported examinations for remote study in a media compound), page 492—494.

It must also be considered that a task can be set by using words, symbols, or pictures.

In a pre-test, the tasks selected are checked as to their usability and the amount of time needed, and are possibly revised in accordance with the test results.

In principle, the tasks are to fulfil the following *quality criteria*[15]: Objectiveness (so that clear and correct answers can be given), stability (always the same results under the same examination conditions, independent of time and location), appropriateness (the tasks must include an essential characteristic from the catalogue of teaching aims), independence (each task must be independent of the others and evaluable in itself), clarity (clear, concrete, and comprehensible working), a suitable degree of difficulty, grading effectiveness (due to their contents and the relation thereof to the teaching aims, correct answers must be given more frequently by the good students than by the other ones).

The main purpose of such computer assistance in examinations (besides the advantage that less time is required and work can thus be rationalized) is that feedback for the learners and teachers is more exact, comprehensive, and faster. Naturally, this discussion of the examination procedure raises basic problems pertaining to examinations as such, which cannot be dealt with in this context. It should also be pointed out that the examination system applied had further advantages as compared with traditional methods, although such traditional methods can of course be justifiable within an intermediate examination system[16]. These advantages were:

Usage of a large number of examination tasks for testing the candidates' knowledge, comprehension, application and judgment (Bloom's taxonomy) can be presented in a form evaluable by machines, so that the determination, grading, and feedback of each candidate's ability is *objectivated* to an extent that can hardly be reached by any of the conventional procedures;

all of the examination results, the examination procedures, and the grading procedures can be *verified* inter-subjectively;

computers permit the examiners to *prepare and evaluate the examination more thoroughly*, as they do not have the burden of having to correct work, a job which takes up a lot of time;

the solutions given by each examinee are graded equally and impartially, without the teacher "considering" the character of the examinee concerned.

6. 4 *Explanation of the examination procedure* by means of question No. 5 from the second examination

6. 4. 1 Question No. 5 from the 15-page worksheet used in the second examination, in which 22 questions were asked.

Question No. 5

Which of the following teaching methods requires the teacher(s) to be present the whole time?
Please mark the correct spaces with a cross.

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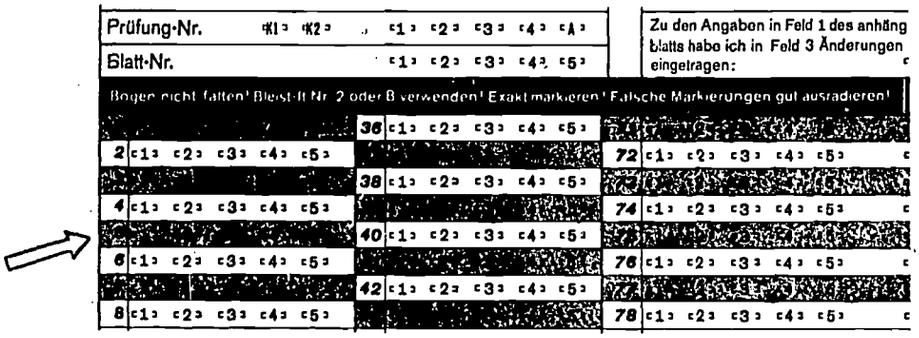
[15]) Cf. the term "Aufgabenanalyse" ("analysis of tasks"): Published in: F. Dorsch (editor), Psychologisches Wörterbuch (Psychological dictionary). 8th, revised and enlarged edition, Hamburg/Berne, Meiner/Huber 1970, page 36 f.

[16]) Cf. Gross, M., *Allinger, U., Busch, H.-G., Rütter, Th.*, loc. cit., page 489—495.

1. Partner teaching		5/1
2. Face-to-face teaching		5/2
3. Individual work		5/3
4. Group teaching		5/4
5. Team teaching		5/5

This is obviously a multiple-choice question, where the correct answers from the five possibilities given must be selected and marked with a cross. The correct solutions in this case are 5/2 and 5/5.

6.4.2 The next step is to enter a horizontal line (with a pencil) in the marking sheet (part of which is shown above) in spaces 5/2 (line 5, No. 2) and 5/5 (line 5, No. 5).



6.4.3 The method applied for evaluating the exam question[17]), supported by computer, is shown by the following chart:

Choice/ answer	code	right/ wrong	indexs of difficulty	standardized difficulty (= points)		grading effectiveness
1	5/1	w	0.07	7/48	0.15	0.23
2	5/2	r	0.00	1/48	0.01	0.27
3	5/3	w	0.04	4/48	0.09	0.20
4	5/4	w	0.06	6/48	0.12	0.22
5	5/5	r	0.31	10/48	0.63	0.36
			0.48	48/48	1.00	

Explanatory notes: Column 4 (index of difficulty) shows that 7 per cent of the students marked the first multiple-choice answer wrong, i.e. 7/48 of all marks or 0.15 (19). The last column shows that the fifth multiple-choice answer has the highest degree of grading effectiveness, i.e. that in the case of this answer most of the good candidates found the correct solution.

6.4.4 Following the evaluation of the examination sheets, the examinees received their certificates (showing the number of points reached and the grade), a feedback sheet showing the solutions handed in at the examination, a copy of the examination paper (see Question No. 5) with the correct answers already marked and a commentary (see below with the commentary on Question No. 5):

[17]) Cf. Gross, M.: Erste Itemanalyse der Klausuraufgaben zum Funkkolleg "Erziehungswissenschaft" (An initial analysis of the items of the examination tasks set in Funkkolleg in Pedagogy). Published in: study letter No. 7, Weinheim, Berlin, Basle: Beltz, page 71.

Question No. 5

Which of the following teaching methods requires the teacher(s) to be present the whole time?
Please mark the correct spaces with a cross.

1. Partner teaching		5/1
2. Face-to-face teaching	×	5/2
3. Individual work		5/3
4. Group teaching		5/4
5. Team teaching	×	5/5

"Partner teaching", "individual work" and group work are, among other things, characterized by the fact that when these methods are applied the learning procedure emphasizes very greatly the aspect of independent work done by the students. The very purpose of these teaching methods is not fulfilled until the teacher need not be present *the whole time* in order to ensure that the students work and learn effectively.
"Face-to-face teaching" and "team teaching", on the other hand, constitute teaching situations where the task of conveying, guiding, and checking learning procedures rests on the teacher or a group of teachers. Accordingly, it is necessary for the teacher(s) to be present the whole time.

6.5 Professor Kadelbach from Hessischer Rundfunk in Frankfurt was *in charge of the organizatory work* for the homework and the examinations.
All the examinations were held on the same day and at the same time, so that they did not last for more than three hours, including preliminaries (writing down personal data, handing out and collecting the examination and marking papers). The following chart shows the number of towns in the four German states were examinations were held, and indicates the number of examinees:

State	No. of towns	No. of examinees
Baden-Württemberg	24	1 688
Hessen	9	1 169
Rhineland-Palatinate	7	434
Saarland	5	201

7. *The Participants*

The chart shown under 6. 2 indicates the total number of participants in the two terms. The composition of the student body was determined only in the case of the students who sat for the second examination. Thus, this section refers to those students and subscribers to the accompanying letters who took an active part in Funkkolleg in Pedagogy.

7. 1 *The male/female breakdown*

Hypothesis: If one proceeds from the male/female breakdown in Funkkolleg model I[18]), about 77 % of the participants should be male, and 23 % female[19]).

[18]) See page 82.

[19]) The figures quoted were taken from: *Sörgel, W.:* Funkkolleg des Hessischen Rundfunks — Hörer und Nichtteilnehmer (The Funkkolleg of Hessischer Rundfunk — Listeners and Non-participants), October 1966. A sociological study. Munich: Infratest 1966, No. 83.

Participants	absolute numbers	%
male	2 159	62.17
female	1 306	37.60
no comment	8	0.23
	3 473	100.00

Explanatory note: This chart and the following ones do not include the examinees having taken the examination at a later date.

Interpretation: The relatively large number of female participants is very interesting to note, not only in comparison with Funkkolleg I, but also in view of the number of female teachers in the overall teaching staff throughout Germany, which is about 33 %. This high percentage probably results from the fact that some of the female participants come from social professions or, in their position as mothers, take special interest in questions of education.

If one proceeds from the male/female breakdown in the overall population, which is about 1:1, the number of female participants is too low.

7. 2 *The age breakdown*

Hypothesis: Most of the active participants are between 20 and 39 years of age.

Age	no comment	male	female
no comment	2	36	17
16 — 20 years	—	14	13
21 — 25 years	1	145	139
26 — 30 years	1	614	380
31 — 35 years	—	614	312
36 — 40 years	—	318	159
41 — 45 years	2	213	121
46 — 50 years	—	122	97
51 — 55 years	—	42	36
56 — 60 years	1	33	24
61 years and older	1	8	8
Total	8	2 159	1 306

Interpretation: A very high percentage of the participants is between 26 and 45 years old. Thus, the people who took part in Funkkolleg in Pedagogy are, on an average, 6 years older than those who took part in model I. This is because the number of "highly-talented participants" and university students is much lower than in model I. The number of teachers and other employees is much higher in the case of Funkkolleg in Pedagogy.

7. 3 *Motives for participation*

Hypothesis: Most of the participants are people who have already completed their studies, but who want to continue their professional training.

Motivation	absolute numbers	% (rounded off)
no comment	28	1
preparing for my studies	247	7
supplementing my present studies	313	9
continuing my training after having finished studying (usually to become a teacher)	2 084	60
general interest	801	23
Total	3 473	100

Interpretation: The hypothesis stating that most of the students took part in order to continue their training after having completed studies, is verified. The number of students who took part for reasons of general interest is remarkably high.
In the many "indefinite" answers given during the second study mentioned beforehand, the people who took part in Funkkolleg in Pedagogy for one these four reasons almost all have a positive opinion on the overall system applied.

7.4 *The level of education*

Hypothesis: Most of the participants have a university education.

Level of education	absolute figures	%
no comment	22	0.6
elementary school	48	1.4
German equivalent to GCE "O-Level"	216	6.2
German equivalent to GCE "A-Level"	332	9.6
specialized school	226	6.5
specialized college	336	9.7
teacher's training school	1 272	36.8
college of advanced technology	51	1.4
university	567	16.3
other level	403	11.5
Total	3 473	100.0

Interpretation: The hypothesis stating that most of the participants (more than 50 %) have a university background, is verified. It is nevertheless quite remarkable to note that almost 50 % of the participants do not have such a high level of education but still succeeded in completing the two difficult terms of Funkkolleg in Pedagogy.

7.5 *The five groups of participants*

Hypothesis: The largest group is that of teachers having already completed their professional training.

Groups of participants	absolute numbers
A *"Highly-talented participants"* who, without having "Abitur" (the German equivalent to GCE "A-Levels" in Great Britain) want to study at a university by taking the so-called "Examination for talented persons". These participants can, at the end of each term, acquire a certificate, two of which must be submitted when they register for this special examination at the education authorities.	288
B *Students of other university faculties* who, as a kind of "general study", want to deal with pedagogics for reasons of special interest, regardless of the primary subject they are studying. Successful candidates may, after having passed the final examination, be awarded a pro-seminar certificate.	235
C_1 *Teachers at elementary schools, secondary schools, grammar schools, and vocational schools* who have passed the two qualifying examinations for teachers, are now working in their profession, and who want to take part in refresher studies. The certificates these teachers acquire are to be included in the files of the responsible school and education authority with the instructions to take these participants into due consideration in the case of promotion, and to assist them in their further professional career.	1542
C_2 *Trainee teachers at schools of general education* of all kinds and levels, who have passed their first qualifying examination. For these teachers, Funkkolleg in Pedagogy is a general pedagogic section in the second phase of their training, which supplements and intensifies their preparatory work. Here, too, instructions are to be given stating that this intensification of studies is to be taken into consideration, showing the efforts the Kolleg participants have made prior to their second qualifying examination, and allowance is also to be made herefor in the theoretical part of this second examination.	508
C_3 *Persons working in adult education or youth welfare, social workers, training directors,* and *training staff* in industry and commerce, persons in charge of educational duties with the police force or the armed forces, and also *other persons interested in educational matters,* such as parents, nursery staff, youth personnel at boarding schools, etc.	977
Total	3 492

Explanatory note: 19 examinees who sat for the examinations at a later date are included in this number.

Interpretation: Although the hypothesis stating that most of the participants are teachers conducting refresher studies after having passed both of the qualifying examinations for teachers, is verified, it is nevertheless remarkable to note that the next largest group took part in Funkkolleg in Pedagogy due to a private and not absolutely professional desire for information. We are glad to say that the 288 participants in group A were offered an educational facility in this way, which would not have been available to them without such a possibility of remote study.

8. *The Research Work done after Completion of Quadriga-Funkkolleg in Pedagogy*

8.1 *The research work done by the German Institute for Remote Studies at Tübingen University (DIFF)*

According to comments made by the director of this institute, the research work done by DIFF can be classified according to the following four activities[20]): The objectives are ...

8.1.1 "to apply the *experience made in other countries* in the field of television studies at a university level, and to examine the *didactical experience on remote studies made in the Federal Republic of Germany* by remote study institutes operating outside of the sector of university education, so as to evaluate this experience for the purpose of organizing remote studies in the Federal Republic,

8.1.2 to accompany the *attempts at providing facilities for remote studies in the Federal Republic* — and above all to accompany DIFF's own trial courses — by studies to be evaluated critically and by commissioning and evaluating appropriate research projects.

8.1.3 to develop principles for a *didactical and methodical approach to remote studies on a pedagogic basis*, and

8.1.4 to check the possibilities of integrating remote studies and remote teaching into the general framework of schools and universities in the Federal Republic, and to develop suitable suggestions for the purpose of realizing such integration."

At present, empirical studies are, among other projects, being carried out in connection with remote study courses run by DIFF (see activities under (2)) in the following subjects:

Quadriga-Funkkolleg in education, biology, English (language laboratory, tape correspondence, and study letters), Quadriga-Funkkolleg in mathematics, mathematics (basic course), chemistry (refresher course by remote studies, intended for teachers of chemistry at secondary level II).

8.2 It was already mentioned at the beginning of this report that *Funkkolleg in Pedagogy* lends itself for research work carried out in the field of remote studies as a *large-scale experiment*, as in this case empirical data are available or can be deduced that are able to provide more general statements or justified hypotheses as to the facts and connections in such a multi-media teaching system. The practical aim of this research work is to procure data supported by empirics, so as to provide the best possible concept for future remote study courses.

With the support of DIFF and under the scientific supervision of Professor Dohmen, professor-in-ordinary for pedagogics at Tübingen and simultaneously the director of DIFF, two empirical studies are being evaluated at present (in addition to the research projects named above), viz. studies on

8.2.1 *the study groups within a media compound* (specialist in charge Mr. K. Müller[21]) in connection with a study on the influence the style of speech of the various authors of Funkkolleg in Pedagogy (in the radio broadcasts) has on the learning process (specialist in charge: Mr. O.

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[20]) *Dohmen, G.:* Deutsches Institut für Fernstudien (The German Institute for Remote Studies). Published in: Zeitschrift für Pädagogik, 13th year, issue No. 6, Weinheim: Beltz, December 1967, page 564 f.

[21]) The following remarks were taken from the internal working paper written by K. Müller for DIFF's research colloquy.

Peters). The aim of this study is to carry out research work – based on the opinions voiced by the Funkkolleg participants and the data applying to these participants – on the necessity and effectiveness (compared with the ratings given by the participants) of applying study groups within the framework of remote study in a media compound, and to describe and analyse the working methods and special problems of the study groups. In addition, various hypotheses from the field of remote studies are to be checked and revised if this is proved necessary or possible by the results.

When this study was started in December 1969 there were 103 study groups at "Volkshochschulen" (adult education schools) in 77 towns in the four German states participating in Funkkolleg in Pedagogy. The scope of the study was limited to Baden-Württemberg, where initially 35 local "Volkshochschulen" had started with a total of 49 groups. The results of this study were supported by the following data:

1. 1 697 questionnaires filled in by Funkkolleg participants,
2. questionnaires handed to the "Volkshochschulen" and the group leaders relating to participation data and the work done in the groups,
3. attendance lists for 11 group meetings held in 9 towns.

In the questionnaires, data on the multi-media presentation of material was also evaluated. In so doing, Mr. K. Müller arrived at the following result:

When expressing views on the media applied within the framework of Funkkolleg in Pedagogy

1. very great significance was attributed to the study letters;
2. great significance to the broadcasts;
3. medium significance to the accompanying seminars, the study books, and the tapes on which the radio broadcasts were recorded, which participants could borrow from local offices;
4. relatively little significance to the same tapes available to the participants at the "Volkshochschulen".

8. 2. 2 *The study letters* (specialist in charge: Mr. H. Hoffbauer)

The aim of this research project is to procure empirical data for improving the printed material used for remote studies on a university level within a media compound. This is done by asking the users of the study letters as to their learning experience and opinions.

The following characteristics are, among others, considered in this context:

The length of the study letters, the number and type of tasks intended for self-testing, the typographical means, e.g. the lay-out used, and other factors. Some 40 % of the participants made their own suggestions for improvements, over and above the answers they gave to the standardized questions.

Furthermore, the conditions and circumstances underlying these ratings and opinions were also examined, resulting for example from such factors as whether a participant was a member of one of the five groups of participants or of the student body, or whether he did not participate in a study group.

Information is also provided on the method used for applying the study letters, and expressions are voiced on the overall system of Quadriga-Funkkolleg in Pedagogy as such.

In their very frank answers, the participants complain especially about the minor professional advantage offered by the certificates. However, this criticism does by no means reduce the extremely positive overall response of the participants to Funkkolleg in Pedagogy.

The main research instrument used was a questionnaire with the following contents and structure: personal data, opinion on the overall system, remarks on the activities induced by the study letters, remarks on the quality of the study letters and their various characteristics influencing the learning process.

This questionnaire was handed out to 3 492 students taking part in the second examination, and was returned, duly filled in, by 2 498 participants. The result of the study will consist of justified hypotheses on the best possible structure of the printed study material. In this way it will be possible to examine the effectiveness of various structural types of study material in an experimental framework.

The two research projects overlap in some instances and thus make it possible for the results to be checked to a certain extent. For example, a comparison of the results of both projects is possible with regard to the opinions expressed on the various media used within the multimedia method of presentation:

The second research project also shows that a very high degree of effectiveness is attributed to the study letters. Nevertheless, two combinations are regarded as even more significant, viz.:

1. Listening to the "Kolleg" programmes, using the study letters, and attending a study group, and
2. listening to the programmes and using the study letters.

9. *Costs*[22])

Each participant was charged a total of DM 24,– for the 8 study letters. The students attending the study groups had to pay an additional fee of approximately DM 2,– for each two-hour group meeting. Assuming a total of 35 such meetings in the two terms, this amounts to DM 70,– for the participants in the study groups. The following breakdown of costs is made up of four items:

1. Costs for the study letters, the homework, and the examinations;
2. production costs for the radio programmes;
3. advertising expenditure;
4. other costs.

9.1 *Costs for the study letters, the homework, and the examinations*

9.1.1	Printing and mailing of the study letters (first and second terms) (financed by the participants, DIFF and the broadcasting stations)	approx. DM 405 000,–
9.1.2	Evaluation of the homework in the first term (student's fees for manual checking)	approx. DM 5 000,–

[22]) Material supplied by the central office of Funkkolleg at the press conference held in the Frankfurt Broadcasting House under the chairmanship of Prof. Gerd Kadelbach, the Marburg team, and DIFF.

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9. 1. 3	Evaluation of the examination in the first term by IBM (including printing of the reports, etc.)	approx. DM	18 500,–
9. 1. 4	Evaluation of the homework in the second term by IBM	approx. DM	1 600,–
9. 1. 5	Evaluation of the examination in the second term by IBM	approx. DM	12 000,–
9. 1. 6	Alterations and corrections	approx. DM	4 600,–
		approx. DM	446 200,–

9. 2 *Production costs for the radio programmes*
(financed by the broadcasting stations)

9. 2. 1	Authors' royalties, first term	approx. DM	32 000,–
9. 2. 2	Travelling expenses, first term	approx. DM	2 500,–
9. 2. 3	Students' fees, first term	approx. DM	700,–
9. 2. 4	Authors' royalties, second term	approx. DM	32 000,–
9. 2. 5	Travelling expenses, second term	approx. DM	3 500,–
9. 2. 6	Students' fees (mailing, etc.), second term	approx. DM	400,–
		approx. DM	71 000,–

9. 3 *Advertising expenditure*

paid to the publisher (Verlag Beltz) (financed by the radio stations)	DM	16 000,–

9. 4 *Other costs*

9. 4. 1	Remuneration of three collaborators in Funkkolleg in Pedagogy (financed by Volkswagen Foundation)	approx. DM	116 200,–
9. 4. 2	Travelling expenses (financed by DIFF)	approx. DM	8 000,–
9. 4. 3	Expenses for clerical work, postage, telephone, books, matrixes, carbon paper, photostats, etc. (financed by Hessischer Rundfunk)	approx. DM	10 800,–
		approx. DM	135 000,–
	Total costs	DM	668 200,–

The total cost for the organizer of Quadriga-Funkkolleg in Pedagogy was approximately DM 668 200,–. This sum only includes the direct costs and does not include indirect expenditure (e.g. remuneration for permanent DIFF collaborators, usage of premises and equipment). Assuming that the average number of participants was 10 000, the total cost per student was DM 66,82 (approx. DM 67,–).

In 1967, the Federal Republic of Germany spent the sum of DM 4 330,– for each full-time student attending a teacher's training college[23]). If we assume

[23]) Der Bundesminister für Bildung und Wissenschaft: Bildungsbericht '70 — Bericht der Bundesregierung zur Bildungspolitik (The Federal Minister for Education and Science: 1970 Educational Report — A Report Published by the Federal Government on the Educational Situation). Bonn-Bad Godesberg: Heger 1970, page 88.

that a full-time student attends 20 one-hour lessons a week, this would result in a sum of 20 times DM 67,– in the case of Quadriga-Funkkolleg in Pedagogy, which would in turn result in a sum of DM 1 340,– for each student.

Naturally, this comparison is not completely justified. However, if it is applied in relation to our present-day university system it does indicate that, by using a media compound studying system made up of a direct phase and a remote study phase, it would be possible to realize a saving of about DM 2 990,– = 69 %.

The actual saving is not quite as substantial as this, as the indirect costs have not been taken into consideration in this calculation. On the other hand, however, a far higher rate of saving will result when the number of students increases, as expenditure for soft-ware will stay the same, regardless of the number of students.

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France **RTS/Promotion**

The establishment and development of an organization for promoting adult education in the way done by RTS/Promotion must be considered in connection with the general development of the educational system, which in turn is an inseparable part of overall economic and social development.

When analysing RTS/Promotion one is initially struck by the close relationship between a relatively simple and modest experiment and the intricate and manifold phenomena influencing the situation in France from 1965 to 1975 very strongly: the structural changes of the economy and of society, the growing realization of the significance of education and training as elements of and requirements for any kind of advancement and progress, the increasing need for education on the part of the individual and on the part of society as a whole, the endeavours to establish new educational objectives, the attitude towards the idea of "permanent education" as the horizon of orientation applying to all educational programmes, and the new concept of the relationships between vocational training and general education.

A sociological study would actually have the task of making clear and analysing the various phenomena with which the RTS/Promotion experiment is linked either direct or indirect. However, the following report does not attempt to examine the present situation, but rather has a more modest objective: To describe RTS/Promotion in its nature as an independent educational programme within the framework of overall adult education in France.

1. *RTS/Promotion and French Adult Education*

1.1 In 1959 the field of "further vocational training" within the system of French adult education was increased in significance very substantially by a Government Act on further education, which in the following years was supplemented by various additional regulations and endorsements. This initiative on the part of the legislative bodies was followed up in 1963/64 by the first attempts at providing adult education on television:

- on a university level by broadcasting a series of lectures run by *Conservatoire National des Arts et Métiers* (Télé-C.N.A.M.)
- for adults not having taken a secondary school leaving examination qualifying them for university study by general education programmes broadcast by the *Institut Pédagogique National* (I.P.N.), from which *RTS/Promotion* originated at a later date.

The resolution to carry out this experiment was taken in 1963 by two interministerial institutions: the "*Commission des moyens audio-visuels dans l'enseignement*" (Committee forApplying Audio-visual Methods in Teaching) and the "*Délégation générale à la Promotion Sociale*" (General Board for Vocational Training). In view of the fact that 52 % of the 300 000 young men drafted for the army had an educational standard inferior to the C.E.P. (school leaving examination of comprehensive schools in France), it was first necessary to improve the general level of education, in this way providing a better and more prospective basis for further vocational training. For this reason the first few programmes were aimed at improving the viewers' writing skill, e.g. the series "Des mots pour nous comprendre" and "A mots découverts".

1.2 An act passed in December 1968 ruled that vocational training was forthwith to become a "national duty" of all public and private instances and organizations. This act provides the basis for a policy of improving the educational standards and professional qualifications of young people and adults.

Among others, the following institutions were established:

- a *"Comité interministériel de la formation professionnelle et de la promotion sociale"* (Inter-ministerial Committee for Vocational Training and Promotion), the general secretariat of which has the task of collaborating in laying down the directives for RTS/Promotion, and
- a *"Fonds de la Formation Professionnelle"* (Vocational Training Fund) which assists in organizing and financing training programmes, research projects and experiments, one of these being RTS/Promotion. (Nevertheless, RTS/Promotion is to a certain extent also financed from the budget of the Ministry of Education.)

Accordingly, RTS/Promotion is not anymore just a subdepartment of school radio and school television being run for experimental purposes only. Since September 1968 RTS/Promotion has been completely independent in terms of teaching and instruction matters, and it is also relatively autonomous in an administrative and financial respect, although of course RTS/Promotion still belongs to "Radio-Télévision Scolaire" (hence the abbreviation "RTS") and uses its technical facilities.

1.3 In 1970 the Ministry of Education was re-organized. This marked the beginning of a new era in the short history of RTS/Promotion.

(A) In spring 1970 the central administration office of the Ministry was newly organized. There are now departments for the "objectives" and for the "means". In addition to the two departments for school-level and university-level instruction (in the "objectives" group), there is now a *"Direction déléquée à l'orientation et à la formation continue"* (Department for Vocational Advice and Training). This shows that the Ministry of Education has assumed the duty of promoting adult education and has given this duty a first-rank position. The above-mentioned department is also responsible for establishing the directives applicable to RTS/Promotion.

(B) In autumn of the same year the *"Institut Pédagogique National"* founded in 1879 was replaced by two new institutes:

- the *"Institut National de Recherche et de Documentation Pédagogiques"* (I.N.R.D.P.) which is commissioned with the tasks of information, documentation, training, and research in the field of teaching;
- the *"Office Français des Techniques Modernes d'Education"* (OFRATEME) which has been established to carry out research on the application of modern teaching technology and develop this technology further. This assignment includes the production and propagation of audio-visual teaching material for schools, vocational training centres, and other adult education facilities.

RTS/Promotion is associated with OFRATEME, thus forming part of an institution the main purpose and aim of which is to provide further education and training for adults.

1.4 In July 1970 the employers' associations and the trade unions signed a contract of great significance for the promotion of vocational training. In this contract, each employee's entitlement to initial and further professional training is formally acknowledged. Moreover, the contract stipulates to what extent working hours can be used for the purpose of professional training.

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It will probably take years before this contract becomes effective in all respects, but it already plays a decisive part today in view of the increasing need for further training, and it is an important requirement for the development of the RTS/Promotion project.

1.5 In accordance with the initiatives mentioned in the foregoing the report of the educational committee for the 6th National Plan (1971 to 1975) suggests constant development of the remote study system, i.e. "teaching of the type practised in RTS/Promotion or in 'Centre National de Télé-Enseignement', which should maintain its present rate of development until the end of the National Plan".

1.6 Seven years after the first RTS/Promotion programmes were broadcast and three years after RTS/Promotion became a more or less independent department, it has accordingly been able to strengthen and slowly secure its position within the important educational movement stemming from the economy and society in France. RTS/Promotion has grown larger and the future appears to be quite promising, but the objectives and functions of the work being done are by no means rigid and unalterable. On the contrary: Like all top-level organizations employing modern techniques in the rapidly developing field of education and training, RTS/Promotion must progress and push forwards constantly so as to fulfil its purpose as an element of alteration and advancement.

2. *The Organizational Structure and the Work Done*

2.1 At present RTS/Promotion forms part of Radio-Télévision Scolaire within the framework of the new organization OFRATEME, the structure of which has so far not been decided on definitely. Like the other two programme departments concerned with producing the instruction material and planning the lessons (one department is for students and the other is for teachers), RTS/Promotion is supported by the following three departments in Radio-Télévision Scolaire:

- The administration department: Finance, staff, equipment.
- The technical department: Production studio, camera teams, graphic studios, animated film tables, cutting room, broadcasting hall, etc.
- The documentation, information, and archives department concerned mainly with the printing of publications, documentation work, and press contacts.

2.2 At present (May 1971), the actual team of RTS/Promotion is made up of approximately 30 persons working on a full-time (or almost full-time) basis. This staff is employed in three individual departments:

- The department for planning and conceiving programmes, accompanying texts, and other instructional media: The persons working here are mostly teaching experts and television directors.
- The department for keeping in touch with the users and above all with the organizations: Mostly teaching experts and documentation specialists work here on information questions, the formation of new groups, and the maintenance of contacts with the tutors.
- The department for research and evaluation work: Sociologists and psychologists who, among other things, have a task of checking the programmes prior to broadcasting, carrying out opinion polls, and establishing contacts with other research institutes. About 10 other employees also belong to this team (administration, secretaries, etc.).

2.3 Up to 1969 the directives for RTS/Promotion were laid down by a special "Programme Committee" that usually got together twice a year. This Committee was made up by delegates from the Ministry of Education and the responsible

departments for other ministries, and by representatives of the most important carriers of adult education: Large companies and associations, the board of trade, institutions for vocational training, associations of general education, etc.

Due to the changes made in 1970 a new managing committee is currently being formed. In fact, this new committee has already convened a number of times within a somewhat reduced framework under the presidency of the delegates for vocational advice and training. These meetings were attended by representatives of OFRATEME, of the general secretariat of the inter-ministerial committee for vocational training, of Conservatoire National des Arts et Métiers, of the association for further vocational training for adults, and by various other experts. Further representatives of the state and of society are also to join the committee soon.

3. *The Objectives and Target Groups*

3.1 Like in the case of all other organizations for further education and training, the objectives applied by RTS/Promotion depend on various factors which today are becoming more and more distinct and clear.

The knowledge of mankind is constantly increasing and expanding. Technology is changing and professions are developing into new realms.

The working population must improve their vocational training — and especially their basic education — to an increasing extent so as to keep abreast with this progress. Provided they have a good basic education, employed persons can reach a higher position if they wish to do so or if they are forced to do so, and they can adapt their vocational training to new situations or change their jobs completely.

However, it is not only the professional world that is changing. Our entire society is in a phase of total conversion. Adults must therefore be able to acquire better and more efficient educational fundaments so that they can understand and grasp their environments and adapt themselves actively to the world surrounding them. In the long run everybody will realize that what he learnt at school cannot and will not last him all his life.

The mass communication media — and especially television — lend themselves very conveniently to meeting the immense need for educational facilities. There are two reasons for this:

- When used as a telecommunications system television offers the individual "education at home", while simultaneously making this offer available to a large student body.
- Being an audio-visual carrier of information, television is also able to convey non-verbal contexts. This is an outstanding advantage for adults with a low level of education, as their poor school background often goes hand in hand with a bad knowledge of the language.

These factors were taken into consideration by RTS/Promotion in laying down its objectives. It was attempted to provide the basis for as many people as possible to adapt themselves to a developing society without difficulty.

On this elementary level of education the individual is to be assisted in improving his skills and knowledge in his relationships with the surrounding world, with his contemporaries, and with himself. In addition, he is to realize the necessity of comprehensive education and to become able to employ other educational media and approach other educational institutions for receiving such training. Within the objectives of RTS/Promotion the two factors of meeting existing needs and stimulating new needs are linked very closely.

3.2 RTS/Promotion is endeavouring to improve the standard of knowledge above all in the following three fields:

(A) *Practice and extension of general knowledge on a basic level*

- Mastering one's mother tongue (in writting and verbally), the rules of communication (human relationships) and of documentation (methods of mental work)
- Mathematics
- Basic technical knowledge (drawing, electricity)
- Knowing the world of today (an introduction to the economy, employment and labour legislation)

(B) *Adaptation of the students' technical knowledge to today's stage of development of vocational qualifications in new fields still being developed, such as:*

- Electronics
- Automation
- Management of small and medium-sized firms (for shop owners and craftsmen)

(C) *Foreign languages*

3.3 No final examination is held after the programmes have been completed and the students do not receive a diploma or a certificate (unlike foreign projects such as Telekolleg or the Open University).

The reasons for this are:

- The examination system applied in France and the many types of technical diplomas already existing;
- the non-existence of a credit system for receiving such diplomas.

It should nevertheless be pointed out in this context that many of the series broadcast do facilitate the necessary preparation work for various exams, especially at the basic vocational level, e.g.:

- Certificat d'aptitude professionnelle, C.A.P. (Professional Aptitude Certificate)
- Brevets d'études professionnelles, B.E.P. (Professional Training Diplomas)
- Brevets professionnels, B.P. (Professional Diplomas)

3.4 Not only are there no examinations in RTS/Promotion, but in the case of most of the programmes broadcast there is also no supervision instance for checking how the programmes are used and applied (with the exception of polls and audience research).

RTS/Promotion is a free educational service offering a large group of potential participants various educational facilities via television or accompanying material. These facilities are either completely free of charge or relatively inexpensive. Anybody interested may exploit this education offer depending on his own individual needs and the amount of time available. He can watch one series regularly, another one only from time to time, and leave out the others altogether. One might well say that RTS/Promotion and similar institutions are attempting to make education a mass consumer product with the help of the mass communication media. Obviously, this implies that institutions such as RTS/Promotion are based on the growing significance of modern educational technology and on the creation of new educational channels. There is a very big difference between these institutions and the traditional school system, their primary aim being further education and training by way of self-study.

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However, this comparison is not quite justified either. Although the consumer appears to be quite free in choosing the programmes — and the other educational elements — he wants to use, he is tied down quite strictly in many cases:

- Practical restrictions: A TV set must be readily available, the conditions for concentrating on the programmes must be good, the broadcasting hours must fit in with the viewer's spare time, he must be able to retain the lessons after having worked all day, he must have enough time in general, etc.
- Psycho-sociological restrictions: The viewer must feel a fundamental need for more education, he must be motivated sufficiently and not take up some other activity, he must be able to persevere.
- Mental restrictions: The viewer must be mentally able to "consume" the programmes (sufficient basic knowledge) and he must be mentally independent so that he can develop his own working methods.

RTS/Promotion is naturally aware of these difficulties and has therefore in the past few years developed ways and means of supplementing its education output. Today, the students interested can ask for concrete work and tasks to solve in addition to the programmes and accompanying material. This complementary work consists either of exercises (which initially are corrected by the students themselves and later by others) or of homework (corrected by way of correspondence). The students also have the possibility of joining in group discussions with other students and the tutor.

This shows clearly that the students are not anymore merely consumers of learning material sent to them by a distant and inaccessible broadcasting station. By solving the tasks set and taking part in the group work they become more active in their acquisition of knowledge and in learning skills and modes of behaviour.

In this way a new relationship is created between the conveyer (RTS/Promotion) and the recipient (the television viewer) of education. As a matter of fact this relationship is more similar to the classical connection between a teacher and a pupil: Communication is not effected in one direction only, but gradually becomes bilateral.

RTS/Promotion is adapting its supervision and regulation instruments more and more to the nature of the students and is thus becoming a genuine educational system.

This item will be dealt with again in the following section, this time in the light of the teaching methods applied.

3.5 The adults forming the target group for the programmes broadcast by RTS/Promotion may be split up into three main categories:

(A) Adults whose need for education is satisfied by watching only very few of RTS/Promotion's programmes — i.e. adults not wishing to take part in educational courses requiring intensive work on a long-term basis and forcing them to change their habits. The following material is conveyed to this group of participants:

- Practice and refreshment of the basic knowledge acquired at school;
- up-dating of their knowledge;
- structure and theoretical intensification of a professional occupation without prior knowledge; and
- conveyance of new knowledge and new skills.

(B) Employed persons wanting to prepare for an examination or improve their vocational standing by taking part systematically in further training courses can utilize the educational facilities provided by RTS/Promotion

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- to make up for a lack of knowledge in various subjects;
- to complement verbal teaching sessions;
- to intensify a course they are attending, or
- to receive a stimulus for individual working methods.

(C) The general audience merely wanting to improve their level of education without having any particular intentions.

4. *The Methods and Instruction Elements*

RTS/Promotion offers the following self-produced instruction elements:

- An instruction system made up of television series and accompanying material (4.1 and 4.2) (since RTS/Promotion first started).
- Exercises going together with some of the programmes, which are corrected after the students have done them (this element was made available only recently):
  - the exercises are sent in for correcting by mail (4.3),
  - the exercises are corrected by computer (4.4).
- In cooperation with and at the initiatives of a number of educational institutions, RTS/Promotion also provides an increasing impulse to persons studying on their own to take part in group work (4.5).

The educational output of RTS/Promotion is aimed at assisting adults in developing effective methods for their own personal work. The degree and intensity of this assistance depends on the individual programme.

4.1 *The Programmes*

(A) Each educational project is made up of a series (with an average of 13 or 26 instalments lasting half an hour each).

The programmes are not just films of traditional lessons. Rather, modern television techniques (reports, interviews, etc.) are used for didactical purposes. In order to facilitate the creation of relationships between the information conveyed and the practical situation in professional life and society, it is attempted to make the viewer identify himself with the situation being broadcast. Illustrative television techniques are intended to trigger reflection and contemplation on the part of the viewer. (Transition from concrete to abstract material, comparisons, etc.)

The programmes are meant to make the viewer think, either by asking him questions directly or by establishing a dialogue between a teacher and one (or several) adults in the programme. These adults (a sample selected from the target group) help the viewer in processing the information presented by asking questions, formulating the information anew, and doing exercises.

(B) When the 1971/72 school year starts these series will be supplemented by two "magazines" intended to activate the relationships and the exchange of ideas between the production team and the students.

- The "Magazine RTS/Promotion" will report on all the series, especially on the individual and collective application of programmes, accompanying textbooks, courses and duties of the C.N.T.E. (Centre National de Télé-Enseignement), and on the exercises. In these programmes questions will be answered and the organization of meetings and discussions will be announced.

— The "Magazine de la formation permanente" has a more comprehensive and detailed objective. This series is intended to help each individual in realizing, analysing and if possible solving his education problem. It thus appeals to a very large audience, above all to those persons who initially are not interested in further education.

(C) Up to now the techniques applied in school programmes have also been used for producing the programmes broadcast by RTS/Promotion. Nevertheless, RTS/Promotion is at present experimenting with electronic productions (especially for the magazine series) with filmed scenes, and with live programmes or programmes broadcast only very shortly after production.

4.2 *The Publications*

(A) An accompanying booklet (fiche d'accompagnement) of 4—10 pages in length serves for personal preparatory and follow-up work. In this way it is attempted

— to prepare the viewers for a programme by announcing its main concepts,

— to offer memory aids,

— to provide references to supplementary information,

— to make it easier to "consume" the material conveyed by providing exercises for self-correction, making proposals for follow-up work and informing the students of suitable reading material,

— to substitute programmes a student was not able to watch.

Up to 1968 the accompanying booklets were published in the form of brochures going together with the individual series.

In 1970 these brochures were compiled every two weeks to form a booklet of about 60 pages in length for all the series. The fee charged was 15 francs for all of the 14 issues together.

In the 1971/72 term these two methods of publication are being combined. One booklet is being published for each series. The price is 7 francs per booklet.

(B) So-called liaison bulletins (bulletins de liaison) are issued regularly to supplement the accompanying booklets. These bulletins provide detailed information, interviews, reports, examination results and extracts from viewers' letters, and are sent to the enrolled participants. Like the magazine series, they are intended to intesify the contacts with the students and to make these contacts more versatile in nature, so as to support the students in their further education efforts.

4.3 Since October 1970 an experiment has been run for correcting the students' work by way of correspondence. This experiment has been conducted in the following three series:

— French
— Mathematics
— Business management

} At the level of the "Brevet Professionnel"

OFRATEME, RTS/Promotion and Centre National de Télé-Enseignement (CNTE) collaborate very closely in carrying out this experiment. CNTE is responsible for all types of correspondence teaching. Instruction teams (équipes pédagogiques) have been established for developing the combined media systems together. This kind of co-operation is necessary so that the individual educational media supplement each other in a suitable manner.

The three series last for two years and correspond to two different grades made up of 14 programmes each.

The programmes are broadcast every two weeks in order to ensure that they fit together temporally with the relevant correction phases. Apart from the "Cahiers RTS/Promotion" (RTS/Promotion booklets), the participants receive additional accompanying material prior to the programmes: instructions for their work, new exercises which they are to correct themselves, and a case study text (in business management). The students are requested to send in their texts as soon as possible after the programme. Two to four weeks later the texts are returned with corrections and individual advice as well as a copy of the ideal solution.

In 1971/72 the enrolment fee for one, two, or three courses is 65 francs for each grade.

Persons taking part in such a combined teaching system are regularly encouraged to keep going, their work is supervised and — provided their learning intensity increases — it may even be said that their studies are similar to the traditional preparatory work done prior to examinations.

4.4 In the 1970/71 term it was attempted to correct certain exercises by using a computer. This was intended to supplement the "statistics" series, which offers an introduction to the basic terms of statistics.

The exercises in this course are presented in the form of questionnaires with multiple-choice answers. The answers are entered on punched cards and evaluated by means of a computer incorporating an optical scanner. Five to ten days after having sent in his answers the student receives a so-called commentary sheet direct from the computer with marks, hints for his work and advice concerning each answer, especially those that were wrong.

The enrolment fee payable for the booklet and the exercises is 15 francs. This method is based on the idea of enabling students to add to the work they do on their own by doing correspondence work as well. Although these computer exercises are not as comprehensive as the tasks done for CNTE or the group work, the students are nevertheless obliged to do some work and submit the result for correction.

The purpose of the exercises is to find out whether the material conveyed in the programmes and the accompanying booklets was understood and retained correctly by the students. Moreover, the exercises provide a certain insight into the level of the students' knowledge.

In conclusion it should be mentioned here that for the teaching staff these exercises are a barometer of the effectiveness of the programmes and the accompanying booklets, i.e. they indicate whether the two media have been conceived in a fitting and appropriate way for the target group. The fast feedback of material (a few days after broadcasting) also offers the big advantage that allowance can be made for the students' reactions even in the following programmes, as parts of the programmes are broadcast live.

4.5 One of the principal advantages of television is that it comes to the student, that is to his home. However, like all types of remote study it also has a disadvantage: The student is isolated, he has no contacts, his learning intensity will therefore decrease and he will have difficulties in keeping up with the material conveyed. It is from this that the idea stems to organize meetings for the students, if possible in working groups under the supervision of a tutor.

(A) Neither RTS/Promotion nor OFRATEME have associated regional centres. Therefore the initiative for establishing or organizing such groups must be

taken on a local level. The existing organizations and institutions, and the public and private bodies serving the cause of training and adult education can however provide working facilities for the groups.

This is the objective of RTS/Promotion in co-operation with the Office for Vocational Advice and Training of the Ministry of Education (Direction déléguée à l'orientation et à la formation continue), and is to be put into practice by the regional institutions for establishing and organizing vocational training facilities, such as:

- institutes operating under the Ministry of Education,
- work councils and trade unions,
- departments for company (or administration) training,
- vocational training centres for adults,
- chambers of commerce,
- chambers of agriculture,
- handicraft boards,
- associations for the promotion of education.

These organizations are able to support the work done by RTS/Promotion in three different ways:

- By publishing and distributing RTS/Promotion's information material (posters, prospectuses, programme placards) and by telling people to enrol.
- By integrating the programmes into their own teaching syllabus.
- By supporting the formation of RTS/Promotion groups:
  - either by holding irregular meetings to supplement individual viewing by the students, or
  - by forming working groups that meet regularly and either watch the programmes as such or film copies or video tape recordings.

(B) As from the 1971/72 school year, RTS/Promotion will place the following material at the disposal of the group tutors:

- "Livrets du formateur" (brochures for the adult educator) corresponding exactly with the individual series' booklet.

  These brochures contain:

  - Remarks on the connections between audio-visual teaching and group teaching, and comments on how audio-visual documents should be integrated in the group work.
  - General advice on the group work concerning the programmes and the material accompanying a series.
  - Suggestions for processing the individual programmes (programme guide, follow-up work or supplementary exercises depending on the series involved).
- Slides for two or three series for complementing the programmes, with charts, graphic representations, etc. intended to provide exercise material geared to each group's rate of learning.
- Study days (at the beginning of and during the term) for the tutors where they have a possibility of exchanging views and talking about improved methods for the follow-up work done by the various types of groups.

— One special page of RTS/Promotion's monthly contact bulletin with reports on the group work and comments made by tutors.

This indicates how new education and training techniques are gradually integrated into the original system, thus making RTS/Promotion become a multi-media teaching system capable of meeting numerous comprehensive and versatile educational needs. Adults wishing to improve their level of education are therefore able to resort to a combined teaching system in which they may participate as far as necessary, as far as they can, and as far as they want. Each and every individual may promote his education in the way he prefers.

5. *The Results*

This section will only deal with the results of the audience research related to the media as such, while the following section is dedicated to the problems of general evaluation.

5.1 *Persons Only Watching the Television Programmes*

This study was conducted twice within two years by the "Institut Français d'Opinion Publique" (I.F.O.P.). Its purpose was to indicate how well the programmes broadcast by RTS/Promotion are known, and what their viewing rate is. The 1970/71 study carried out in April 1971 (from which the figures quoted in the following have been taken) used a sample split up among four phases of the survey conducted regularly by I.F.O.P. This sample consisted of 8,300 persons representative of the French population over 15 years (35 million persons; 28.7 million television viewers).

RTS/Promotion and its objective are known by 6,500,000 persons. Three million have watched at least half of the programmes broadcast in one of the 14 series. On an average, each viewer watches 2.2 series. The viewing rate of the individual series ranges from 1 to 4. One must be very careful in deducing any assumptions from the sequence of viewing rates, as various factors — some of which are independent of the programmes as such — have an influence on these rates, e.g. the day and time at which a programme is broadcast, and the number of programmes.

The following list shows the five series watched most often:

Title	Number of viewers
Mathematics for all	1,000,000
Electronics	720,000
Labour legislation	670,000
Business management	560,000
Methods of mental work	530,000

5.2 *The Subscribers to the Accompanying Material*

5.2.1 *The Number of Orders*

Up to the 1969/70 school year the booklets which are available free of charge were often ordered by the students' simply making a cross on the lists of titles printed on the prospectuses. This led to an excessively large number of orders, and studies revealed that about one third of the booklets mailed were practically never used.

In order to put an end to this waste of material the students were requested to enrol and pay a certain fee for the booklets in 1970/71. The accompanying material was thereupon sent to them periodically. In this way it was hoped to ensure that the material would be used regularly (the booklets were mailed every two weeks) and intensively (money factor: the students must pay).

Although this reduced the number of orders (24,000 enrolments), it is not so easy to make a comparison between the 1970/71 school year and the preceding years. The reasons for this are that students borrow the booklets from each other or that several students enrol under one name. It has been determined that one-fifth of the enrolments are not sent in by one student alone, but by several. This tendency is promoted by the fact that the pages of each booklet can be taken out and compiled in the form of brochures accompanying the individual series.

It was also noticed that almost 50 % of the students who subscribed to the accompanying material in 1970/71 had never ordered any of the booklets before.

It is interesting to compare the group of "genuine" students (i.e. those who watched the series on a fulltime basis) with the group of "casual" students, and to note the factors these two groups have (or do not have) in common. Two of the four series with the largest student body also had the largest general audience, viz. "Mathematics for all" and "Electronics".

The other two series on the other hand ("Mathematics for the Brevet Professionnel" and especially "Automation") took last place with the general television audience whereas they ranked second with the subscribers to the booklets.

In general it seems to be a fact that programmes presenting mathematic, technical and scientific material are watched much more often by persons who have the accompanying material than other series(language, methodology, economics, and society) for which the accompanying material is not so important.

5.2.2 *Socio-demographic analysis* revealed that the composition of the audience and its participation in the individual educational programmes has stayed more or less the same. The figures quoted in the following from the 1970/71 study do not deviate considerably from the figures determined in the previous years, with the exception of the percentage of students and school children.

(A) *Sex:* Male 80 %
Female 20 %

It should be noted in this context that in the 1969/70 I.F.O.P. survey on television viewers who do not order the accompanying material the percentage of females was much higher. In fact, this percentage was either equal to that of the male viewers in 7 of the 14 series, or even somewhat higher. These series were the following:

- four series on modern languages,
- two series on written expression and methodology,
- one introductory series to modern mathematics.

(B) *Age:*

Under 20 years	6.9 %		
20–24 years	10.2 %	30,9 %	
25–29 years	13.8 %		62 %
30–34 years	14.9 %	31.1 %	
35–39 years	16.2 %		
40–44 years	13.6 %		
45–49 years	12.1 %		
over 50 years	12.3 %		

The average age of the viewers ranges from 32 to 37 years, depending on the series.

The surveys carried out in previous years were characterized by a far higher percentage of viewers under 20 years of age.

There are two main reasons for this change in the representation of the individual age groups:

- The introduction of fees for the accompanying booklets which, although they are not very high, may make young people still in training and without an income of their own refrain from ordering the booklets.
- The discontinuation of two introductory series in electricity and technical drawing, which were both watched primarily by young people.

(C) *Professions:*

In the 1970/71 school year the enrolled students had the following professions:

Manual workers and foremen		19.1 %
Office and shop employees		10.7 %
Farmers		0.5 %
Army personnel and police force		2.4 %
Medium-level executives		35.7 %
hereof: technical professions	18.1 %	
teachers and instructors	5.7 %	
Self-supporting persons, high-level executives, industrialists and company managers		16.8 %
hereof: teachers	4.3 %	
Persons without professions		14.8 %
hereof: school children and students	77 %	
old-age pensioners	3.4 %	
housewives	3.4 %	
other groups	1 %	

The evaluation of these figures gives rise to numerous questions, especially if they are compared with the figures of the previous years.

- The percentage of persons without a profession is going down, especially that of students and school children. The reasons for this are probably the same as those already mentioned.
- The very indistinct and not clearly defined category of medium-level executives is made up mainly by persons working in technical professions (many different levels), but also includes a large number of teachers and instructors, who constitute a subgroup which do not only watch the programmes and order the accompanying material for their own studies, but also do so to find new teaching ideas and models.

  A more accurate analysis shows that the series can be split into two large categories:

- Series of special interest to workers, technical people, and school children: technical drawing, electricity, electronics, automation, mathematics for attaining the "Brevet Professionnel".
- Series preferred by salaried personnel, medium and high-level executives, housewives, and — to a lesser extent — by workers:
  economics, human relationships, modern languages.

(D) *The Students' Level of Education*

The 1970/71 survey provided results similar to those of former surveys. The levels of education comply with the official categories of professions:

Level of education	Examinations taken	Percentage in 1970/71
VI	C.E.P. (Certificat d'études primaires)	8.5 %
V	C.A.P. (Certificat d'aptitude professionnelle) B.E.P.C. (Brevet d'études du 1er cycle)	30.1 %
III	B.T.S. (Baccalauréat technique scientifique) D.U.T. (Diplôme universitaire technique)	29.6 %
	1er cycle de l'enseignement supérieur (lower secondary school level)	8.9 %
II & I	2e et 3e cycles de l'enseignement supérieur (medium and upper secondary school level)	11.1 %
No answer		11.8 %

The average level of education of the RTS/Promotion students is thus higher than that of the French population as a whole. Nevertheless, this difference in education standards becomes smaller if one considers that the students are relatively young and therefore correspond to the younger sector of the population, who are still in training. There can be no doubt that it is more difficult to reach the population groups with the lowest level of education. This may well be due to reasons unknown so far which would have to be analysed in terms of sociology, but it might also be possible to overcome these difficulties – at least to a certain extent – by using more appropriate teaching methods.

(E) *Participation in other Further Education Facilities*

In 1970/71 almost one third of the students who had enrolled in RTS/Promotion also took part in other further education courses, and in the previous years this percentage had been even higher. This decrease in recent years is due to the change of age group representation already mentioned and is also caused by the percentage of students and school children enrolled in RTS/Promotion.

Of the RTS/Promotion participants who also take part in other courses

- 9.8 % have enrolled in correspondence courses (especially those run by CNTE)
- 8 % have enrolled in company courses or courses organized by several companies, or they take part in public or private vocational training courses (including the A.F.P.A.)
- 7.5 % attend direct teaching sessions organized by the Ministry of Education (including the Conservatoire National des Arts et Métiers)

5.2.3 Other surveys reveal *in what way the programmes and accompanying booklets are used, and what their effectiveness is.* Naturally, the results of these surveys deviate substantially from one series to another and depend on the respective student body in each series.

A study was also conducted on a series intended to teach the students basic technical concepts ("An introduction to automation"). This study was not aimed at

forming general conclusions, but was carried out merely in order to provide information. It showed that there are four groups of participants with various modes of behaviour:

- Students and apprentices who regard RTS/Promotion as a supplement to their regular learning. Accordingly, they behave both actively and independently.
- An "expert" audience that enrols in RTS/Promotion only is interested in the series for professional reasons. It appears that this audience takes part in the courses offered much more intensively and is much more consistent and persevering.
- Adults taking part in other further training courses on automation regard the RTS/Promotion series as a supplement to their principal learning schedule, which is easy to integrate in this schedule.
- Unlike the groups mentioned above, the persons taking part in the series due to general — and not professional — interest seem to be less active and more superficial in their work. Normally, all they do is watch the programmes.

5.3 *The Students Enrolled in Centre National de Télé-Enseignement*

The three further training courses intended to supplement the programmes and the written accompanying material by offering correspondence work and study (cf. 4.3) did not begin until October 1970 and will last for two years. An organization established by the Ministry of Education and which is independent of RTS/Promotion and CNTE, has been assigned to conduct a detailed evaluation of these courses. This organization is the "Institut National de Formation des Adultes".

The information provided so far is still incomplete and does not allow any conclusions. Nevertheless, the number of persons who enrolled in the various courses in the first year (enrolment fee for one or two courses: 55 francs; for all three courses: 110 francs) might be mentioned in this context:

French language	763
Mathematics	565
Business management	483

This means there were approximately 1,800 enrolments and 1,000 participants.

5.4 *The Persons Who Volunteered to Take Part in the Computer Experiment (Correction of Exercises by Computer in the Statistics Series)*

Here again the relevant study (cf. 4.4) has not yet been concluded. A lot of work still remains to be done on the relationship between the students' achievements and their socio-graphic status.

It should however be pointed out that the 650 volunteers who took part in this experiment seem to deviate in character from the other students who ordered the material accompanying the series. The differences are:

- a lower level of education and a more technically oriented training;
- a greater percentage of persons with relatively low professional qualifications (workers, salaried personnel, etc.).
- an almost complete lack of students without a profession.

5.5 *The Students Who Took Part in the Viewing and Discussion Groups*

The low number of groups and the fact that it was possible to form them without giving prior notice are the reasons why hardly any information has been made available so far on the application of the RTS/Promotion series by training organizations and facilities.

(A) *Statistical Data*

In the 1969/70 school year the organizations that ordered accompanying material or information material had the following status:

40 % belonged to public institutions, viz:

- 18 % to the Ministry of Education,
- 6 % to the Ministry of Defence,
- 6 % to the Ministry of Labour, and
- 10 % to other public institutions,

60 % belonged to private or nationalized institutions, viz:

- 38 % to company training facilities run by one or several companies,
- 18 % to autonomous associations with non-commercial objectives, and
- 4 % to associations run by trade unions.

52 % of the students watched the programmes on their own, while the other half (48 %) did so in connection with educational institutes. 75 % of the students in the latter half watched the programmes in organized groups.

The programmes were shown in the following way:

- 28 % were broadcast direct by the television network,
- 16.7 % were hired to the users in the form of film copies,
- 1.3 % were sold to the users as film copies, and
- 2 % were distributed in the form of recordings.

Whenever the programmes were made available as film copies or recordings, group work — usually supervised by a tutor — was also organized for the students.

(B) *The Results of Several Case Studies*

The following information is based on the observation of work groups and discussions with tutors, students, and adult educators.

First it was attempted to determine the application of the educational offer in connection with the educational carrier used (television, films, recordings) and the students' educational objectives.

It became clear that the primary factor influencing the students' mode of application was neither the audio-visual document (subject; the style typical of the individual series) nor the support provided by the accompanying material. Rather, it was the tutor and his relationships with the group of students involved.

The question as to whether the students will accept the audio-visual information or reject it depends largely on the tutor and his attitude towards his employer, towards RTS/Promotion, the subject, the techniques employed, and the students.

At present the number of groups is increasing and the tutors are able to use several very different media (audio-visual and printed; meetings). Studies on these groups and formations are being carried out, so that it should be possible to analyse the connections between the printed and the audio-visual RTS/Promotion media and the group work supported hereby with increasing clarity.

6. *Perspectives*

Although the history of RTS/Promotion is short, this adult education facility using modern educational media in remote study courses is obliged to move forwards

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constantly and adapt itself to the respective needs and the means available. However, both the needs and the means depend on two principal elements in our modern world: education and technology.

6.1 *The Need for Education is Increasing Quantitatively, but is also Changing Qualitatively*

In the near future, the big unknown factor in France will be the practical application of the contracts stipulating vocational training, that were concluded by the trade unions and the employers' associations in July 1970. To what extent, at what rate, and in which way will it be possible to overcome the difficulties prohibiting the practical application of these contracts?

Will the provision of further training facilities during working hours, a new possibility available to a great number of employed persons, weaken or support the traditional adult education system (individual initiatives with a negative effect on spare time and private life, voluntary work and intensive personal effort)? It should be pointed out here that although RTS/Promotion uses modern teaching technology, it still corresponds to the system applied in most of the other further training courses (night school and correspondence courses), as the students still have to study outside of their working hours and do not receive any remuneration. Due to the fact that vocational training courses are gradually being incorporated in the individual's normal working hours (for which he receives remuneration), it is quite possible that the present output of educational programmes by RTS/Promotion will be split up into two large sectors during the next few years:

- Further training programmes for usage by the working groups to be set up on the basis of the July 1970 contracts. (Probably these programmes will be made up of picture cassettes.)
- General introductory and sensibilization programmes broadcast on television as "educative spare time behaviour".

6.2 *Technology and Educational Technology will Probably Develop along the same Lines*

Obviously, the possibilities of transmitting audio-visual material will increase considerably. Apart from radio transmissions, there will be cable television and above all the picture cassettes and video-discs — depending on the system industry and commerce give preference to. It is very likely that the various functions will be fulfilled by means of various procedures and that the means available will be adapted more efficiently to the immense need for education. Technology will play a supreme part in the entire field of education. Students will not be forced to accept fixed schedules and timetables any more, and they will be able to decide on their own rate of progression.

In addition data processing will provide new possibilities and methods that can be combined with the classical audio-visual media.

However, this twofold technological development presents several difficult problems for institutions such as RTS/Promotion, e.g.:

- Should the production output be continued on a uniform basis (i.e. public broadcasts) and should recordings (with or without cassettes) be regarded as a secondary method?
- Or should the production output be split up
  - into programmes for the general television network, and
  - cassette programmes?

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This problem is also linked with the question as to how much significance should be attached to the specific requirements of special professional organizations and groups.

In addition, it depends on the general question as to how the production of audio-visual material for educational purposes will be effected locally, regionally, nationally, and internationally.

6.3 By conducting a combined analysis of the development of educational needs and technology it should be possible to define the objectives and functions of RTS/Promotion within the overall complex of adult education and vocational training more exactly in the years to come. At present, possibilities of general education and training are being offered to a large audience. The programmes do not form a combined whole, but rather constitute a multitude of separate offers without a clearly defined objective.

Other activities might also be undertaken:

(A) *Activities in the field of "further training":*

- The provision of complete training cycles (with a prospective C.A.P., B.E.P. and B.P. examination at the end). The individual's motivation will be intensified by the possibility of improving his professional standing and receiving a diploma.
- Specific educational campaigns might be conducted whenever an urgent need arises. Such campaigns should be run within a ministerial or inter-ministerial programme and should have definite aims (e.g. in the field of data processing).

(B) *Activities aimed at "sensibilization":*

Planning of sensibilization, information, and orientation programmes for

- a certain target group: e.g.
  - immigrants working in France,
  - women taking up a profession again,
- or a certain need: e.g.
  - information and sensibilization of a large audience so as to develop general adult education,
  - orientation in fields of further education of primary significance.

(C) *Activities for meeting the educators' needs:*

Participation in the educators' training (sensibilization and/or further training).

6.4 The system used by RTS/Promotion must be altered to a considerable degree, depending on the hypotheses applied in practice by the institutions that make the decisions as to future educational policies. This will have a special effect on:

a) *Programming:*

- Instead of 12–20 series broadcast annually (which are relatively independent of each other), uniform programme groups (2, 3 or 4 series) must be created with clearly defined aims and objectives.
- The individual information and sensibilization programmes must be renewed every one or two years.
- Short-term assignments must also be carried out.

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b) *The instruction method:*

Without forfeiting its original objective of providing audio-visual teaching at home (by television), RTS/Promotion must establish multi-media systems in order to fulfil its planned functions. A systematic analysis must be carried out to ensure that the systems used are the most suitable for reaching the envisaged aims and exploiting the available means.

6.5 The future of a project like RTS/Promotion does most probably not only depend on how the television medium is used, but mainly on

- the ability of RTS/Promotion (over and above its tasks as a production centre) to establish contacts with the students (educators and persons taking part in the courses) and to extend and intensify these contacts, thus serving a definite purpose within the framework of the educational system, and on
- the ability of the adult education facilities as a whole to integrate the potentials of remote study and to make allowance for the requirements of the remote study system.

The future of remote study and educational technology does not rest in the hands of a few central organizations, but is a task to be fulfilled by all educators and all educational institutions together.

Roland Garnier
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OFRATEME

TELE-C.N.A.M.

One of the functions of "Conservatoire National des Arts et Métiers" (C.N.A.M.) is to provide college level courses for employed persons in science, economics, the humanities, and law. The lessons in these subjects are presented after normal working hours.

19,000 students live in and around Paris, while 20,000 have enrolled at the 68 associated centres situated in various parts of the country. The number of persons interested in taking part is probably much greater, as many prospective participants wish to acquire information and knowledge (e. g. for taking the university examination in engineering) or want to improve their professional standing.

Following the request of an inter-ministerial committee, which was formed in 1963 for examining the potential of television as an educational medium, C.N.A.M. has carried out several experiments on the application of television for the purposes of teaching since November 1963.

The Establishment of the Relay Distributor Network

The students living in the Paris region were able to attend the courses at a number of associated centres in the suburbs. However, as it was not possible to increase the number of such centres as desired, a special television network operating by means of the relay system had to be set up. Thanks to this system, the students can take part in the normal lectures either at reception centres near where they work, or at home. Small working groups are formed under the supervision of professors or engineers, so that questions can be discussed and exercises done before or after the lectures.

In 1963 three lectures were transmitted straight from the lecture hall, no changes having been made in their mode of presentation and no rehearsals having been carried out beforehand (two one-hour lectures each week):

A preliminary course in mathematics

Fundamental physics

Fundamental radio engineering

Eight reception centres with a total of 300 seats had been set up in colleges and secondary schools in the suburbs of Paris. C.N.A.M. was by no means sure that this experiment would definitely be a success, and the students were not very pleased about this innovation, as they had to make themselves familiar with new methods and were somewhat anxious about their examinations.

These initial difficulties are confirmed by the low number of enrolments in the first year. 900 students could have been accepted by the centres, but on the day of the opening lecture only 450 had immatriculated. The C.N.A.M. students were very cautious. A week later three-fifths of the seats had been taken, and in course of the month 200 students left the lecture hall and enrolled at the reception centres, the capacity of which had thus even been exceeded in theory. Most probably, the students who came a bit later had received positive information on the television lectures from the students who had enrolled at the very beginning. The participation rate of the reception centres was higher than that of C.N.A.M., whereas there was no difference in the percentage of graduates.

Further Development

In view of the positive results of the first year of television lectures, C.N.A.M. increased the number of television courses from three to six in the 1964/65 term. The number of students increased to 1,500.

In autumn 1965 two additional courses were started, and the number of enrolments went up to far more than 2,000. The following courses were broadcast each week:

Preliminary course in mathematics	(2 hours)
Fundamental mathematics	(2 hours)
Correction of the students' work in fundamental mathematics	(1 hour)
Fundamental physics	(2 hours)
Fundamental chemistry	(2 hours)
Preliminary course in radio engineering	(1 hour)
Fundamental radio engineering	(2 hours)

The Initial Results

The results of the examinations show clearly that the students who watched the lectures on television were just as successful as the students who attended the lectures in the lecture hall — or even more successful in many cases.

There are several reasons for this:

a) Time saved:

A study carried out on the 1963/64 radio engineering course revelated that the students attending the reception centres in the suburbs of Paris saved 1½ hours a week for two two-hour courses. If they had attended these lectures direct, they would have needed this time for travelling.

b) Function as an assistant:

Small working groups were formed due to the fact that the lectures were broadcast by television (Groupes Télé-C.N.A.M.). The formation of these groups had a positive influence on the students' individual work, and intensified the contacts between students and teachers.

c) Better working conditions:

It is easier to concentrate if there are only 30 students in a room and if the desks provide enough space for workbooks, writing, etc. As the reception centres are smaller than the lecture halls, the students can pay more attention to the presentations.

d) The television factor:

As television constituted only one element within this teaching complex, it proved difficult to define the exact role it played. In addition, it must be considered that the broadcasts were live and presented in the form of normal and unadapted lectures, which had not been programmed for television purposes. The programmes were not rehearsed or adapted by a television director. Rather, the camera merely showed the respective professor's lecture, which in turn was influenced by the students in the lecture hall. — There were also various other reasons which made it impossible to exploit the potential of the TV medium in full.

Nevertheless, the students were satisfied with the presentations. Criticism was raised only rarely. One negative factor was that the students at the reception centres were not able to take an overall look at large blackboards in the lecture hall, on which they could have concentrated during the lectures. If the writing on the blackboards is to be

shown clearly and legibly on the television screens, only a part of the blackboard can be scanned by the camera. Nevertheless, it is possible to broadcast a camera shot of the boards taken from a somewhat greater distance, provided the students are not sitting too far away from the television screen (the maximum permissible distance between the students and the screen being six times the diagonal measurement of the screen from one corner to another), and provided the screens are shielded against reflections caused by lights and windows.

But is it really so important to have an overall view of the blackboard? The television students think that the picture on the screen has an intensifying effect and increases their attentiveness. Some even say that they can take notes more economically and effectively thanks to the television technique, and a number of those students who criticize the fact that the blackboard is "split up" into smaller parts nevertheless admit that this method does have advantages: Considering that they are not able to refer to what has already been written on the board — unless, of course, the professor does so himself — they listen to the lecture with a higher degree of concentration as they are not tempted to deal too closely with details, but rather to follow the logics of the explanation given.

The Relay Distributor Network in 1970/71

In 1970, 5.400 students enrolled in Télé-C.N.A.M. As compared with the initial system, the present relay network has been changed and new reception halls have been opened. For example, the "Association Versaillaise pour l'Enseignement continu" (Association for Further Education in Versailles) started with one reception hall, added two more in 1966, a third one in 1967, and has had a total of five since 1969. Large industrial entreprises and work councils are also willing to open up reception centres on their premises, and the Thomson Company in Bagneux and Bull in Paris XX^{e} (5 reception halls) have already started. It should be mentioned in this context that these centres situated on factory premises are open to all the C.N.A.M. students, and not just to company employees.

The broadcasting schedule has also been changed. In the 1970/71 term the following courses were broadcast each week:

Elementary mathematics	(2 hours)
Fundamental mathematics A (1st year)	(2 hours)
Correction of the work done in mathematics A	(1 hour)
Fundamental physics	(1 hour)
Fundamental mathematics B (2nd year)	(2 hours)
Correction of the work done in mathematics B	(1 hour)
Fundamental electronics	(2 hours)
Fundamental data processing	(2 hours)

The Initial Courses Broadcast on Channel 2 of O.R.T.F.

The fact that large organizations, e.g. the "Comité d'Expansion économique de l'Oise" (Committee for the economic development of the Oise district) were interested in this method of television instruction, induced the responsible persons to carry out another experiment: In autumn 1966, at the beginning of the new term, the following courses were broadcast in the Paris area for four hours a week on Channel 2 of O.R.T.F.:

Elementary mathematics	(2 hours)
Fundamental radio engineering	(2 hours)

For this purpose 12 new centres were opened, all of which operated according to the same principles as the centres linked up within the relay distributor network. This provided complete coverage for the Paris area, where relay transmissions are not always possible.

By broadcasting its courses on Channel 2 of O.R.T.F., C.N.A.M. did by no means want to merely extend its range of influence, but rather had the following intentions:

- To broadcast the courses to areas where there are no college or university facilities, not so much to meet the educational needs and requirements of such areas, but rather to stimulate a desire for further education among the people living there.
- To arouse motivations for technical studies at a university level and to make viewers interested in permanent education.
- To provide the basic knowledge and requirements for studying at a college or university, to convey the knowledge and skills needed for dealing with a special subject, and to enable the viewers to acquire fundamental aspects or scientific data in a novel or relatively unknown field.
- To give participants the possibility of sitting for examinations which are acknowledged by adult education institutes or by the participant's employer.

Thanks to the courses being broadcast on Channel 2 of O.R.T.F. the C.N.A.M. facilities were made available to a much larger audience. Although hardly any promotion or advertising work was done prior to the first programmes, both television viewers and numerous organizations stated immediately how interested they were. In some cases students who had discontinued their studies due to bad transport connections to the universities or for personal reasons started again at home by watching the courses. High-level employees in industrial enterprises and large companies, professors, teachers, army personnel, doctors and scientists also took part in the courses. They naturally do not want to take an examination, but they do require new information, especially as regards current developments in their specific subjects. A great number of letters received by C.N.A.M. confirm that this initiative was correct, and in many cases people regret that it was not taken earlier. In many cases the writers stated that the scope of the courses should be extended and that the entire television network should start broadcasting the lectures.

The Further Development of the Programmes Broadcast by O.R.T.F.

Various new courses have been broadcast by O.R.T.F. since 1966:

Fundamental mathematics	(2 hours per week)
Data processing	(2 hours per week)
Modern mathematics	(1 hour per week)
Introduction to probability calculation	(1 hour per week)

Audio-visual presentations, models, charts, and film reports were used in the programmes on the fundamentals of data processing, which were broadcast from January to May 1968. As usual, the course was held in a lecture hall. However, it was not presented in the form of a lecture as such, but rather as a discussion between a professor and an assistant. The production team had developed accompanying material to go together with this course, which made it unnecessary for the television participants to take notes. (The charts shown on the screen were the same as the drawings that the students had been given.) This experiment was so succussful that the course (40 lessons) was adapted and included in C.N.A.M.'s syllabus, and a great many students have taken it since 1969.

The lecture hall did not offer the facilities required for broadcasting the film reports. This problem of finding suitable rooms was solved by providing a conference relay between the lecture hall and C.N.A.M.'s computer lab: The professor acted as the supervisor and commentator for everything that was being filmed 400 metres away from him. This attempt at making the ex cathedra lectures more versatile proved to be a success, as is indicated by the positive reaction of 200 companies which had set up groups for taking part in the course.

The programmes on modern mathematics were broadcast for the first time in January 1969. These were not normal C.N.A.M. courses, as it was possible in this case to replace the passive student body in the lecture hall by small groups of three to five persons, who could discuss things with the professor.

The course on proability calculation broadcast in the 1970/71 term by the O.R.T.F. studios in Lyon and prepared by the associated centre in Clermont-Ferrand maintained this dialogue system — which improved both the mode of presentation and the contents of the programmes.

The Department for Further Vocational Training (Service de Formation Professionnelle) of O.R.T.F. has produced a number of films — some of which are in colour — which supplement the C.N.A.M. courses in electronics and data processing and fit conveniently into the overall output. The Department for Further Vocational Training broadcast the course on fundamental electronics for several years running. The lecture was held from 6 p.m. to 7 p.m. and the transmission was repeated again on one of the next few days in the early afternoon. The same procedure is now also applied for the course on general data processing: The lecture is broadcast direct from 6 p.m. to 7 p.m. and re-transmitted during the same week from 1 p.m. to 2 p.m.

The course on general data processing was also an attempt at applying multi-media instruction systems: The students can buy written accompanying material and textbooks in support of their individual work. Various material is also given to the assistants who have regular discussions so as to co-ordinate the lessons and to provide advice for the leaders of the student groups viewing the courses together. In addition, it was found necessary to provide a so-called "correspondence system for the exercises with individual correction and statistical computer evaluation" for the participants, following the successful electronic evaluation of a questionnaire conducted in 1968 and after various studies had been carried out during the examinations and a study had been conducted on behalf of Télé-Promotion Rurale. For this purpose C.N.A.M. concluded a contract with the Ecole Normale Supérieure in Saint-Cloud which initially — in the experiment phase — limited the total number of enrolments to 2,000. Apart from the advantage offered to the students in this way (who can now have their exercise work corrected), the production team hopes that it will be able to adapt the course to the participant's level of comprehension on the basis of the answers given in the exercises. Television programmes developed within the framework of multi-media teaching systems had to make the "TV viewer" become a "TV participant".

The Relay Distributor Network

The programmes are broadcast on the relay network on the 7.000 megacycle band.

This naturally means that the transmitters and the receivers must be within immediate sight of each other. In the case of C.N.A.M. the transmitter sends the audio-visual signals to a paraboloid mounted on the roof, which in turn transmits the signals to the Meudon television tower. This tower, which at present incorporates two transmitters, is under the administration of the Ministry for Postal Affairs and Telecommunications. It serves as the relay station and covers the Paris area by means of two

so-called "cornets", i.e. broadcasting emitters. One paraboloid faces in the direction of Versailles, the second one functions as the link to the Bagneux centre (via a passive relay station), while the third serves the Corbeil Essonnes centre, situated some 20 miles away.

The Technical Facilities Available at Present

From the Meudon tower, O.R.T.F. picks up the visual signal via another relay beam. (The sound signal is transmitted direct through a telephone cable.)

At each relay station a paraboloid once again picks up the signals transmitted by the Meudon tower, and a demodulator passes on the audio and visual signals to the individual reception centres.

The Equipment and Facilities in the Reception Centres (for transmissions by the relay distributor network or by O.R.T.F.)

Most of the reception centres are in normal halls which have to be modified especially for this purpose (e.g. no reflections may be caused by the windows or the lighting). In certain cases special measures were taken enabling the usage of blackboards. Unlike other companies, Bull did not set up the television sets in a canteen, but rather provided five rooms furnished especially for the people taking part in the television courses, where it is possible to change the intensity of the lights. In addition, these rooms have special equipment for receiving programmes and doing group work. They are also equipped with the so called "Telemegascope" made by the Dassault company, by means of which the courses broadcast by O.R.T.F. can be projected onto a screen with much larger dimensions than a TV screen. Finally, the "Polyvision" system developed by the Thomson company should also be mentioned. By using this apparatus, the students are able to watch the programmes on mirrors placed next to their textbooks and workbooks. The mirrors reflect the pictures from television screen mounted on the ceiling. (The screen breakdown system was changed round in this case, so that the mirrors show a normal picture.)

In university and college level teaching a great amount of information must be conveyed simultaneously by the television set. It is thus quite clear that the picture must always be absolutely perfect. Moreover, the reception halls should be equipped so as to permit efficient group work in a multi-media learning situation.

Great Britain **The Open University**

Introduction

In September, 1967, a Planning Committee was appointed by the Labour Government to work a comprehensive plan for an Open University and to prepare a draft Charter and Statutes. This committee was set up following a government white paper entitled "A University of the Air", an idea conceived by the Labour Party in Britain and presented to Parliament by Harold Wilson.

In January, 1971, just over three years later, the Open University began to teach its first courses to 25,000 students. The courses are being taught through a multi media system of correspondence texts, TV and radio broadcasts, group and individual tutorials and short residential schools.

Almost all the students are over the age of 21. The vast majority of them are engaged in full time employment and will continue to be so while they are studying for their degree. The role of the Open University in teaching these students is perhaps best defined by reference to the Inaugural Address given by the Chancellor of the University, Lord Crowther, on 23rd July, 1969:

"The first, and most urgent, task before us is to cater for the many thousands of people, fully capable of a higher education, who, for one reason or another, do not get it, or do not get as much of it as they can turn to advantage, or as they discover, sometimes too late, that they need. Only in recent years have we come to realize how many such people there are, and how large are the gaps in educational provision through which they can fall. The existing system, for all its expansion, misses and leaves aside a great unused reservoir of human talent and potential. Men and women drop out through failures in the system, through disadvantages of their environment, through mistakes of their own judgment, through sheer bad luck. These are our primary material. To them we offer a further opportunity."

Since that time the Open University has been asked, by the Conservative Minister for Education, to examine the possibility of also teaching students of school-leaving age (i.e. 18 year olds). The conventional universities of the United Kingdom, already crowded, are faced with a doubling in the demand for places by 1980 and it may well be that the Open University can satisfy some of that demand, even though it was not conceived for that purpose.

The Open University is committed to searching for the best media for various types of learning. A further reference to the Chancellor's address will indicate the extent of this commitment:

"We are open as to methods. We start, in dependence on, and in grateful partnership with, the BBC. But already the development of technology is marching on, and I predict that before long actual broadcasting will form only a small part of the University's output. The world is caught in a Communications Revolution . . . Every new form of human communication will be examined to see how it can be used to raise and broaden the level of human understanding . . . "

A further point for consideration is the financial one. The Open University, with large student numbers, will operate at a fraction of the cost of conventional universities, and its students, while working full time, will not be grant aided. The major obstacles to the expansion of conventional universities are their operation costs per student and the provision of student grants.

The initial capital expenditure for the establishment of the Open University was provided by the Labour Government and this has been continued by the present Conservative Government. Because the Open University will operate with a comparatively small academic staff and will have no full time residential students the capital expenditure on buildings and equipment has been relatively small. The operating costs for a full year of operation are estimated at £ 3.5 million for 20,000 students but over and above this is the direct "student cost" made up of part time regional staff, library facilities, etc. This particular item of expenditure cannot be accurately forecast until the university has been in operation for one or two years and can assess the regional organisation fully.

The Open University hopes to go some way to becoming financially independent by selling its courses both at home and overseas. For this reason the university has recently appointed a Marketing Director, the first post of its kind in a British University.

Organisation

The organisation of the Open University is particularly complex since it incorporates not only the central academic teaching facilities and registry, but also large data processing units and correspondence services which are centrally based, and a complex network of regional organisations. It may be most convenient to examine this organisation by reference to the following charts depicting the organisation at various points in the system.

1. *The Major Teaching Channels to the Student*

The Open University student has the benefit of a unique instructional system, through which he has many points of contact between himself and his teachers.
He receives educational information through seven channels and, in addition to this, he has access to a local counsellor who is responsible for advising the student on problems of a non-academic nature.

If we examine the seven major channels through which educational information reaches the student we find that four of these channels are primary ones in which new information is presented to the student. These are the correspondence text, the TV broadcast, the radio broadcast and the summer school.

The central university organisation can be regarded as centring on the Course Team, a group of people drawn from the appropriate Faculty, the British Broadcasting Corporation (BBC), the Institute of Educational Technology (I.E.T.) and any relevant consultants co-opted for a particular expertise. The academic members of the team prepare the basic teaching material for each course unit and they are helped in this by I.E.T. representatives.

The course material is prepared in the form of units, each unit lasting one week. In one whole course there are up to 36 units to be completed in one year, but from 1972 there will be courses comprising 6, 12 and 18 units, to be completed in correspondingly shorter periods. For most of the courses 90 % of the students' work is reading, both from correspondence texts that are sent through the mail and from recommended books. In some cases there is a special supplementary text, prepared by the appropriate faculty, where no suitable text book is available. The correspondence material may also include self-assessment tests (designed to give the student instant feedback on his progress), appendices, reinforcement sections and broadcast notes.

In the Science and Technology Foundation Courses and in some of the higher level courses in these faculties the course teams have designed home experimental kits which are sent to the student at the beginning of the year. The science kits include a microscope, a balance, a photometer, a stopwatch, chemicals and reagents, among other

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things, and the student is asked, in the correspondence text, to carry out one or more home experiments each week. In many cases these experiments are closely integrated with the television broadcast, e.g. the broadcast may illustrate the experiment, perform a more complex version of it, or be used to illustrate an elaborate experiment, the results of which the student can write up for himself.

Some academics are not happy with the bulk of the unit material being presented to the student in written form and are considering the use of cassette tape recorders as a partial replacement which will make use of an auditory sense rather than a visual sense.

Many people think of the Open University as a television university, but in fact TV broadcasts and radio broadcasts each take up only 5 % of the student's time for each learning unit. The broadcasts are 25 minutes long, and are repeated once.

In many units the components are closely integrated and the full teaching ability of the unit can only be expressed if the student studies all of the media of presentation. Other units use the TV and radio for background knowledge and enrichment programmes.

In addition to the sequence of course unit material which the student receives during the course of the year, all Foundation (first level) course students will have to attend a summer school for one week in the year.

The summer school will be a period of intense activity based on those aspects of the course which are most unsuited to other media, (e.g. Science students will concentrate on laboratory work). In these schools the student will meet not only his local staff tutor but also some of the academics from the central campus.

At the moment the summer schools have not received the same scrutiny as the rest of the course as regards the formulation of aims and objectives and no mechanism has been set in motion to evaluate them.

Two of the other remaining three channels are essentially feedback channels. These are:

i) The assessment from the computer marked assignment which the student has completed and returned to the central correspondence service in Buckinghamshire. Records of these results are retained by the university registry and copies are also sent to the staff tutors in the regions (see below) and to the course teams via the Institute of Educational Technology (I.E.T.).

ii) The result of the tutor marked assignment which the student has done and returned to the central correspondence service. This service sends the assignment to a correspondence tutor who marks it, adding advice and suggestions for further work, before returning it to the student via the correspondence service. Records of this assessment are also held by the registry and copies are sent to the staff tutors and the course teams (via I.E.T.).

The seventh channel available to the student is at his local study centre where he can discuss his work and associated academic problems with a class tutor.

The study centre also provides a number of other facilities and functions:

a) It enables the student to meet his fellow students doing the same course.

b) The student can, if he wishes, watch the TV transmission and listen to the radio broadcast at the study centre.

c) The assembled students and the class tutor can hold group discussions and seminars.

This means that the Open University student is not subject to the physical and mental isolation which can characterize other forms of correspondence course.

The study centres take on an even more important role in fourteen fringe areas of the United Kingdom where the transmissions of BBC 2 TV cannot yet be received. Each of these centres is equipped with a complete film library of the television programmes, complete with the necessary audio-visual equipment, so that the students do not miss the content of the TV transmission.

To summarize, the student is in receipt of primary teaching material, valuable feedback (with comments and advice) on his progress and he also has the opportunity to discuss his work with a class tutor and with fellow students.

2. *Regional Organisation*

The class tutor and correspondence tutor are in contact with the regional staff tutor who, apart from having detailed information through data processing about the progress of the students, is also a member of the course teams based in the central headquarters in Buckinghamshire. This means that the staff tutor can function in two important ways:

i) He can pass on detailed information about individual student progress to the correspondence and class tutors, and also via the senior counsellor to the student counsellor. These three people can then react according to the individual needs and problems of a particular student.

ii) He can receive comment concerning the major problems created for the students by the primary teaching material, through the class and correspondence tutor, and can pass this information on to the course team. In this way the teaching material is screened as it is used and this information, together with that from computer marked assignments, tutor marked assignments and developmental testing of the material, is feed back to the course team who can then modify the course in the appropriate manner.

Problems of a non-academic nature are handled by the student counsellor who is responsible to a senior counsellor. The role of the counsellors in the system is seen as being of particular importance, since one of the characteristics of a teaching system where the student is remote from the primary teacher is a high drop out rate. It is hoped that the counsellors will be able to minimize the drop out rate and so enable the Open University to maintain its cost-effectiveness. (This factor is based on the cost per head of the student population, therefore any drop outs raise the cost per student.)

There are twelve regions in the United Kingdom and each is administered by a Regional Director who is in contact with the central Registry for the co-ordination of student administration. The Regional Director, the Staff Tutor and the Senior Counsellor are full time appointments, while the other regional posts are part time appointments filled by suitably qualified academics.

Central Organisation

The university is made up of six faculties: Mathematics, Science, Technology, Arts, Social Science and Education, together with the Institute of Educational Technology. The major administrative divisions of the Open University are the Registry, Correspondence Services and Data Processing, all of which are large organisations since they must deal with the huge student numbers within the university. By contrast, the staffs of the faculties are relatively small compared with conventional universities.

The function of the members of the faculty is primarily to produce the course material, although facilities to carry on with academic research do exist and many staff have arrangements for research at institutes outside the Open University. The production

of the course units is a process in which the academic staff work in close harmony with representatives from I.E.T. and the BBC. Course units are produced in three phases:

Phase I

General planning – outlines of conceptual model of the unit – formulation of the aims and objectives of the unit. At this stage the role of TV and radio is discussed with the BBC and the structuring of the unit is examined by the I.E.T. representative.

Phase II

The correspondence text of the unit is produced as a first draft. It is discussed and criticized by the course team and will almost certainly be revised at least once at this stage. It then goes through the process of Developmental Testing using student volunteers or professional collaborators to do the testing. The test programme is organized, performed and evaluated by the I.E.T. representative.

Phase III

In the light of the developmental testing results the text is again modified and then printed. Self-assessment tests, computer and tutor marked assignments are all written at this stage, usually with guidance from the I.E.T. member.

Meanwhile the planning of the TV and radio broadcasts has gone ahead and this will be discussed more fully below.

The computer marked assignments are passed on to data processing by the I.E.T. representative who also evaluates the results of completed computer marked assignments before reporting back to the course team.

The Institute of Educational Technology

The Open University is unique in having an Institute of Educational Technology which provides a representative for every course team engaged in course production. The functions of the I.E.T. representatives can be summarized as follows:

1. To advise the academics on the preparation of the aims and specific objectives of the course.
2. To help the academics to produce test material of a type which can form part of a computer marked assessment. This is most important since it can prove particularly difficult to produce tests aimed at higher learning objectives, e.g. analysis, concept formation, critical evaluation, etc., and yet these are the type of tests which the computer marked assignment has been designed to cope with, in addition to the simpler kinds of multiple choice question.
3. To carry out the Developmental Testing of course units as they are produced and advise the course team academics on any modification which may be necessary.
4. To ensure that statistical data on computer and tutor marked assignments reach the course team members. These data may influence the nature of a re-written programme for another year.
5. To advise the course team writers on the educational aspects of unit production such as the production of conceptual models, the ordering of information and the inclusion of self-assessment tests which give the student immediate feedback as he is learning.
6. To work in co-ordination with the academics and BBC representatives in selecting those areas of the unit model which would best be served by TV and radio.

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I.E.T. members are closely examining the whole approach to the preparation of a course unit, its text, audio-visual aids, testing systems, etc. The basic concept is to devise a self-improving system which will be constantly changing, sometimes through small changes as a result of feedback data, through new data from I.E.T. research and through new ideas and concepts from the faculties.

Television and Radio

The TV and radio sections of each unit are transmitted by the BBC. The BBC is a non-commercial organisation financed in part by the government and in part from the revenue raised by licensing TV receivers. This means that none of the Open University transmissions are interrupted by commercials.

In addition to this, the BBC have co-operated in letting the university have a peak TV viewing time between 18.30–19.30 hours on four evenings during the week as well as between 10.30–12.30 hours on a Sunday. Each TV transmission is sent out once on a Sunday and once during the week. The TV programmes are transmitted on the BBC 2 channel, a mixed audience channel, and this means that the programmes will reach a wide sector of the general public as well as the students. The educational implications of this have yet to be assessed.

The radio programmes are transmitted at approximately the same times of day as the TV programmes, but naturally they are arranged so that they do not overlap. Each radio and TV programme lasts for approximately 25 minutes.

At the present time the programmes for the courses are produced at the old headquarters of the BBC, at Alexandra Palace in London. In due course the Open University may be equipped with its own television and radio studios.

Few of the TV and radio programmes which have so far been produced have been evaluated in any way. Indeed, the aims and objectives of the broadcasts have to be made clearer and this is an area in which the I.E.T. hopes to become involved. It is difficult to state the criteria for using one medium rather than another for a particular instructional task. There are problems of training academic staff to work within the media, in both the preparation and the presentation of material. This is clearly a field requiring a great deal of research and evaluation.

Degrees

The Open University has decided that the degree offered to its students should be that of B.A. (Open University), regardless of the courses taken to obtain that degree. The degree will be issued as a certificate which will bear the complete analysis of the courses taken by that student in obtaining that degree.

In contrast to other British universities, the degree will be awarded on a credit basis, a full credit representing one complete course of 36 units. The student will be required to obtain six credits for an ordinary degree and eight for an honours degree. In both cases, two foundation courses must be included in the course and, for an honours degree, an appropriate number of third and fourth level courses must also be included.

There are two advantages in this system for the student:

1. Should he fail to complete his degree he will still have the credits for courses successfully completed.
2. If for any reason (e.g. family commitents, ill-health, etc.) the student fails to complete a course, he has only to repeat it at a later date to continue his degree. Many other universities lack this flexibiltiy.

The question of giving appropriately qualified students any credit exemptions is being discussed at the moment. The primary intention of the system of credit exemptions would be to encourage student interchange between other centres of higher education and the Open University, e.g. a student at a conventional university, having completed two years of a degree course, may be forced by domestic circumstances to leave his course and seek employment. It is hoped that such a person would be able to have credit exemptions and continue his degree course at the Open University.

It should be emphasized at this point that the degree awarded by the Open University will stand equal to the degrees awarded by other British universities.

A few resident post-graduate students have already been enrolled at the Open University and it is hoped eventually to introduce non-residential post-graduate courses. These will lead to the degrees of Bachelor of Philosophy (B.Phil.), Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D.) depending on whether one, two or three years of post-graduate study are undertaken.

In addition the university hopes to offer Diplomas for specialized courses of value to those in industry, commerce and the professions.

Courses

The university offers its degree courses at foundation, second, third and fourth level. The foundation courses are:

Humanities	A 100	Arts Faculty
Mathematics	M 100	Mathematics Faculty
Science	S 100	Science Faculty
Understanding Society	D 100	Social Science Faculty
The Man-Made World	T 100	Technology Faculty

(The Faculty of Educational Studies will not offer a Foundation Course.)

The foundation courses are multi-discipline courses encompassing all respects of their parent faculty. They are designed to give the student a wide basis in the subject matter involved and ensure that he is aware of other aspects of his particular subject.

The second level courses are offered mainly as half credit courses (i.e. two can be done in one year). While many of them are strictly specialisations of particular study areas in any faculty, there are also interdisciplinary courses available and these are prepared by representatives of two or more faculties.

The numbers of third and fourth level courses to be produced over the next few years are yet to be finalized, but plans have been made for the production of the following:

Numbers of Courses Planned for the Open University

	Numbers of 2nd Level Courses	Numbers of 3rd and 4th Level Courses
Arts	2 (both full credits)	6
Social Science	6 (one full credit)	9
Educational Studies	3	3
Mathematics	2 (both full credits)	5
Science	10	16
Technology	3	4
Interdisciplinary	11	6

Second Level Courses to be Offered in 1972

Arts	Renaissance and Reformation The age of revolutions
Social Science	Decision making in Britain New trends in Geography National income and economic policy The sociological perspective
Education	Personality growth and learning School and society Environment and learning
Mathematics	Linear mathematics
Science	Comparative Physiology and Biochemistry Comparative Physiology and Environment Geology and Environment Geology and Geochemistry Chemistry: bonding and structure Chemistry and Biochemistry Chemistry and Geochemistry
Inter-Faculty Courses	Elementary Mathematics for Science and Technology Mechanics and Applied Calculus Biological bases of behaviour Electromagnetics and Electronics Solids, liquids and gases

Conclusion

At the time of writing, the Open University has been teaching its students for exactly one month. It is too early to try to draw conclusions or to indicate those areas where most difficulties have occurred or most progress has been made. A great deal of work is still to be done in many areas (e.g. the summer schools) but it is fair to say, at this stage, that the Open University ist the first multi media system of its kind in higher education. It represents an attempt to apply many of the principles of Educational Technology. In its planning, a systematic approach has been employed in which the student has featured as the central consideration. It is possible that there will be high drop out rates until potential students have realistic expectations of what they can do, learning through the University system; but there is every hope that the University will be able to offer educational opportunity, at the university level, to many who were formerly deprived.

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Netherlands **TELEAC**

1. General remarks

Since February 10, 1965, the population of the Netherlands (and the Flames in Belgium) have been able to enrol in several educational courses organized by Teleac and broadcast, among others, by the public broadcasting network of "Nederlandse Omroep Stichting" (Dutch Broadcasting Foundation, NOS). This was the beginning of "Remote Studies in a Media Compound" in the Netherlands.

Unlike other countries such as the Federal Republic of Germany (Telekolleg), the United Kingdom (Open University), Poland (Politechnika Telewizyjna), etc., where for understandable reasons it was decided to use a structured curriculum, Teleac has hitherto applied a so-called "open programme concept". Each year, an average of 13 to 15 courses are produced and broadcast.

Although the overall output cannot easily be broken down into strict categories, it can nevertheless be arranged in three principal groups:

- general education (language courses, music, theatre, archeology, etc.)
- information on topical subjects in fields like: nuclear physics, automation, biochemistry, polemology, etc.
- further education courses for certain professions (e.g. teachers, farmers, general practitioners, etc.).

Usually, the Teleac projects are made up of five components:

- the television programmes (a varying number of courses, with two half-hour broadcasting periods a week)
- the study material, either written or audio-visual, which is sent to the participants at prime cost
- the working group meetings held under expert supervision
- examinations held at the end of the project
- the organized follow-up work carried out in the form of study weekends, meetings of participants, etc.

The various Teleac projects are not intended to prepare the participants for any kind of public examination enabling them to reach certain objectives — vocational or other. On the other hand, however, it has become clear that many participants were able to make use of the certificates they received after the final examination, for example when applying for new jobs, etc. The primary purpose of the final examinations is to serve as a stimulus for encouraging the participants in their studies and giving them a possibility of proving what they have learnt and applying it successfully.

2. The development of TELEAC

The initiative leading to the foundation of Teleac was made by the Dutch Society for Trade and Business.

This society appointed a committee which drafted a three-year-plan on the basis of the permanent education principle. The initial purpose was to deal with the rapid development of science and technology and the aspects of uncertainty and insecurity resulting from this development both in society and in cultural life. Teleac was pro-

jected with the primary aims of satisfying the "objective and subjective needs" of the population for further education courses, and of providing basic information in a very general sense.

The Minister of Education in office at the time supported the preparatory work for Teleac by a substantial grant. It was his wish for Teleac to make a substantial contribution to the democratization of education by providing study projects "of significance for large sectors of the population".

3. *The legal status of TELEAC*

In 1964, discussions held with the Minister of Education, Arts and Science led to the suggestion to negotiate with "Nederlandse Omroep Stichting" (Dutch Broadcasting Foundation, NOS) on the co-operation needed for solving the technical problems involved in the project, and an agreement was concluded in September 1964.

The following decisions were made in this agreement:

- Teleac is to assume the responsibility for the planning and the contents of the projects.
- NOS is to be represented in the programme committee of Teleac which, subject to the final decision to be made by the administration department of Teleac, is authorized to approve of or amend the suggestions made for the courses.
- The technical staff (including the director) is to be made up of employees of NOS.
- The courses are to be presented by NOS in co-operation with Teleac.

A unique aspect was that Teleac was provided with a studio of its own in Delft. This was done for various reasons, one of them being the possible co-operation with the technical college in that town.

Pursuant to para 10 of Dutch broadcasting law, the broadcasting time for Teleac's working programme was made available to NOS. Following a change of the Cabinet, the Ministry of Education, Arts and Science was split up in 1966 to form the Ministry of Education and Science and the Ministry of Cultural Affairs, Spare Time Occupations and Social Welfare. Since that time, the Dutch Broadcasting Corporation has been under the control of the Ministry of Cultural Affairs, Spare Time Occupations and Social Welfare (CRM).

In formal terms, Teleac is subordinated to NOS and receives a financial contribution from the fees paid by television owners in the Netherlands.

4. *The organizational structure of TELEAC*

As already mentioned, Teleac is a foundation and is responsible for the presentation of its programme. Teleac is controlled formally by NOS and subsidized by the Ministry of Cultural Affairs, Spare Time Occupations and Social Welfare.

A representative of this Ministry holds a seat in the administration of Teleac, which is in charge of the foundation. The administration department is assisted by an advisory board and a programme committee.

The projects are produced by a studio in Delft and an office in Utrecht.

The advisory board has more than 30 members representing a large number of social and scientific institutes working in the same field as Teleac. These experts give advice to the administration of Teleac in matters of programme presentation, and play an important part in answering questions concerning the needs for further education of the persons interested in the courses, whom they represent.

The programme committee of Teleac is made up of representatives of the administration department, of the advisory board, experts from other organizations, and members of the staff. It is this committee which decides on the final programme presentation to be adopted by Teleac for a period of several years.

5. Broadcasting times and duration

Although the number of lessons varies from one subject to the other, the duration of the television lessons is always half an hour. This 30-minute duration has become a "principle for Teleac due to political and broadcasting directives", in spite of the fact that various studies examining the duration of television lessons had results deviating very considerably from this half-hour period.

It has already been mentioned that each television lesson is broadcast twice weekly. The total broadcasting volume has been as follows in the individual years since Teleac started operating:

1965	65 hours and 15 minutes
1966	107 hours
1967	109 hours and 2 minutes
1968	180 hours
1969	180 hours
1970	180 hours
1971	180 hours

In the Netherlands, 9 broadcasting organizations working on an ideological and/or religious basis all attempt to fill the family and peak viewing hours (7.00 p.m. — 10.30 p.m.) with educative, entertaining, or informative programmes.

Two channels are at the disposal of these broadcasting organizations.

The consequence of this situation is that Teleac is given off-peak times for broadcasting its programmes, either in the early evening (while people are having supper or putting the children to bed) or the late evening (when a person's ability to concentrate and learn is diminishing, when people go to bed, etc.). In other words, Teleac, too, is subject to the problem of having unfavourable broadcasting hours.

There is fortunately one exception to this rule as Teleac broadcasts its programmes every Saturday morning from 9 a.m. to 12 a.m. Nevertheless, it has become evident that even at these hours participation density is frequently not much better than at the unfavourable broadcasting times.

The relatively insignificant interest shown in certain Teleac projects is, when regarding the number of participants in comparison with the number of viewers in a given area, obviously a problem not caused by unfavourable broadcasting hours alone.

There are now plans for a third television channel, which may soon be used exclusively for broadcasting television courses within a media compound.

6. The budget of TELEAC

The average sum placed at Teleac's disposal each year by the CRM Ministry is 2 000 000 guldens, whereas the average sum which Teleac is able to spend on half an hour of live television broadcasting was 2750 guldens in 1965 and 3800 guldens in 1971.

True, this was certainly a low budget for a 30-minute television programme, especially at the beginning. This was due to the fact that people still believed in 1965 that educational television programmes should be as matter-of-fact and sober as possible (so-called "naked television"). It was assumed in this respect that the people watching the programmes would be highly interested and motivated from the very beginning.

It was this concept, and the budget which was based thereon, which led to the classroom-like presentation of the Teleac lessons in the first few years.

7. Enrolment

Being a non-commercial organization, Teleac offers interested people in the Netherlands the possibility of enrolling in one or several projects twice a year, i.e. in September and January. Although it is planned that as from the beginning of September 1972 the projects are not to consist of more than 13 to 15 lessons (= 13 to 15 weeks), the length of the individual projects varied considerably in the past few years. This was usually due to suggestions or urgent requests made by experts and specialists not connected with Teleac, who were of the opinion that the courses did not offer sufficient tolerance and that a number of Teleac courses were either much too long or much too short.

8. The programme concept

In the course of the years that have gone by since Teleac started its work, many people have reflected on the aims and programme presentation of Teleac, both inside and outside of the organization. After all these viewpoints and opinions had been exchanged, it became obvious that there was a need to form some kind of connection between the work done by Teleac and the expedited development of culture and society. Naturally, the concepts of "adult education", "life-long learning" and permanent education", which are developing throughout the industrial world, and the realization of the necessity of these concepts, played an important part in the programme planning for Teleac.

One of the results that followed from this was, for example, that the strict difference between courses related to practical aspects and courses related to theoretical subjects was eliminated. If somebody believes that "keeping informed and up-to-date" in a profession is merely a question of having specialized knowledge, then he has clearly not grasped the dynamic changes taking place in our society. Naturally, this does not mean that further education in a professional sense is superfluous, but rather that such education is in many cases absolutely necessary for helping people "who have been left behind" reach a certain standard.

If, for example, the manager of a production plant is concerned with the problem of automation, it will not suffice if he confines his studies simply to finding out how a computer works. On the contrary, he must also ask himself what influence the automation process has on the social structures, the economic way of thought, and the cultural feelings of a society.

Due to the very limited broadcasting time available to Teleac (and of course the limited funds) it has not been possible so far to create a "fully-fledged" programme along the lines of permanent education.

However, possibilities may arise in the near future of presenting a well-balanced output of educational courses, as soon as a third channel is started solely for the purpose of broadcasting instruction programmes.

When Teleac was founded, primary importance was attached to adult education. Today, adult education has become only one sector in the overall field of permanent education, so that the question constantly arose what element should be chosen for Teleac:

a) general surveys,
b) selected subject matter,
c) popularization, or
d) practical application.

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In answer to this question, it was decided to split up the overall output into courses dealing with specific subjects (a, b, c) and courses related to practical aspects (d).

In compliance with the principles applied by the Council of Europe ("New Trends in Adult Education") Teleac related a person's need to keep informed and up-to-date to three different dimensions:

a) his profession,
b) his time,
c) his surroundings.

Aspects of spare time occupation are grouped under c), these including – in a broad sense of the word – language courses (tourists), hobby courses (e.g. photography) and cultural series (e.g. the Teleac course "The Attic Tragedies", 1966).

Although such a structural breakdown offers certain practical advantages, it should not be over-estimated. A course such as "Living Philosophy", for example, is also of significance for a person desiring to keep informed and up-to-date in our modern day, so that the following breakdown also appeared to be possible:

a) individual education,
b) vocational training,
c) social education,
d) study of scientific (and technical) developments.

However, this breakdown was not clear enough either, as a subject like "Computer Logics" could be grouped into any of the four categories.

In addition to the above, the Teleac organization is of the opinion that the public television medium in a democratic society has the first and foremost duty to announce and pave the way for new developments. Thus, television has a special task consisting in the conveyance of dynamic instruction material, while other media may be resorted to for conveying more conservative material.

9. *How a project is produced*

a) The "little red book"

Like other institutions and organizations, Teleac has also examined the possibilities of introducing a systems approach applied to media systems. With the help of structural, functional and analytic models (cf., among others, M. Schmidbauer, Educational Technology, Council of Europe CCC/EES 1971, p. 42) some 60 questions were compiled for this purpose. These questions were broken down into categories and listed in a "little red book", which provides a provisional outline of the "Teleac Media System". The questions grouped in the various categories relate to the following aspects:

- instructional purpose
- learner
- standard of instruction
- course
- teaching method/feedback
- instruction material
- results achieved by learners
- examinations

b) The procedure applied

As soon as the answers to the questions "What?", "For whom?", "Why?", which lead in a combined form to the selection of a specific project, have been discussed among the staff and the programme committee has approved of the concept and idea underlying this project, a year of preparatory work commences.

Teleac's team is made up of the following persons:

- Instructional advisor
- Producer
- Programme director
- Public relations advisor
- Expert

The producer of the lessons is responsible for the continuity, communication and co-ordination of the team, which does not act together in every phase of the preparation and production work. The "little red book" serves as a kind of checklist for the various inter-disciplinary and independent functions within the entire projet.

The instruction material to be dealt with is elementarized in a so-called leaders' group made up not only of Teleac staff but also experts from outside of the organization. A small production staff is formed out of this leaders' group and has the task of preparing the drafts and producing the project as such. As soon as this work has been done, screen tests are carried out for selecting the most suitable television teachers. At Teleac, preference is given to specialists with substantial knowledge in the subject involved, and not to well-known television speakers, as the latter are not considered to be the right persons for acting as teachers on television. Very often, the lacking experience of the teachers in appearing on television is set off by their authentic style of instruction and their ability to improvise. Following this preparatory work, the aim of the planned lessons is analysed in terms of two further factors:

1. The contents and presentation of the television lessons.
2. Additional instruction media required for the course (e.g. correspondence material, programmed teaching material, etc.).

Before the actual production work is started on the course, a so-called pilot project is drafted. This pilot project comprises pre-tests and follow-up tests and provides initial contact with the respective target group of learners. The primary objective of these tests is to examine the comprehensibility of the lessons and the attitude of the future participants to the project.

After the information gained in this manner has been discussed and processed, the production work proper can be started. It is attempted to produce the various media within the overall compound synchronously, i.e. at the same time. Prior to the broadcasting of the course, the television lessons are recorded on video-tape.

It might be added at this point that Teleac has, in the past few years, carried out a number of experiments with some so-called "open" television lessons or parts of lessons. The aim of these experiments was to give the people taking part in the courses the possibility of asking one or several of the experts in the study groups any questions that might be of interest. Unfortunately, it was not possible for various reasons (e.g. production, etc.) to broadcast the panel discussions live, so that these feedback sessions lost their spontaneousness and became slightly artificial in nature.

As soon as the pilot project has been tested in respect of all its components, a promotion campaign is started for the forthcoming project, with articles and interviews in daily and weekly newspapers and journals, press conferences, television commercials, short excerpts from the programmes, posters, etc.

Studies on the programmes are carried out while they are being broadcast and after the project has been finished. At present it is unfortunately not possible for Teleac to apply the results of these studies for changing the individual project concerned, mainly due to the structure of the projects and the production techniques used. Nevertheless, these results are most certainly taken into consideration for the development and production of similar projects at later dates.

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10. Additional information regarding 9.

It has been attempted to give a rough description of the Teleac system and the methods and approaches used. At this point we believe it would be worthwhile to deal with a number of aspects more closely.

a) *Orientation and compilation*

The various programme categories applied by Teleac serve as the basis for the orientation and compilation work done by the research department.

At present, these programme categories are as follows:

- individual education
- socio-cultural education (society)
- science and technology
- special subjects and vocations
- post-academic learning
- language courses.

It is quite obvious that a basis such as these categories is very complicated and everything but easy to handle. For this reason, Teleac's "open programme concept" is based on the fundamental idea that the programmes planned must be aimed at satisfying as large a scope of interests and needs as possible (something for everybody), until structural and functional changes have been brought about involving principal factors such as the organization's autonomy, broadcasting hours, and financial issues.

Suggestions for future courses are either sent to Teleac by third persons or developed by the staff. The proposals sent to Teleac from outside are submitted by private persons, institutions of all kinds, and state authorities.

Several sources are used for determining which activities should be initiated by Teleac:

- Original research (scientific and statistical reports, reports on meetings and conferences, journals, newspapers, etc.)
- Working groups (instruction, agriculture, art education, etc.)
- Advisory office (annual questioning and counselling sessions)
- Research on the viewers' interests and preferences.

The suggestions received by Teleac or submitted by the organization's own staff are then examined by means of a code of priorities in order to select the most suitable proposals.

This code of priorities is based on the following criteria (among others):

- What quantitative and qualitative arguments are there for stating how urgent the suggestion involved is?
- How large is (are) the target group(s) and what is (are) the compilation of this (these) group(s)?
- What other types of instruction are there for the subject involved or for the target group(s), and what must be considered regarding their contents, scope, and usability?
- What possibilities does this remote study have for providing a media compound?
- Does the suggestion somehow fit into the overall output broadcast in a certain term?
- Are there suitable teachers and/or organizers for the programmes?
- Will it be possible to receive grants? etc.

If the programme committee makes a fundamental decision and resolves for various reasons to provide information to a certain group of persons while a number of courses are being broadcast (e.g. general practitioners and teachers), a new element must be integrated in the decision-making process, viz. the results of a poll carried out with the groups involved. In such a poll, the following questions might be asked:

— What's your opinion on further education provided by Teleac in co-operation with . . . ?
— What do you think about certain styles of presentation such as . . . ?
— What time do you think would be best?
— What are you interested in and what do you prefer especially?
— How interested are you in . . . ?

In the case of vocational training courses and courses dealing with specialized subjects — which involve important professional groups for the nation and for society (teachers, doctors, agriculturalists, etc.) whose age, training, residence, etc. can be defined very exactly in sociological terms — it is not very difficult to determine the concrete need for further education. Here, it is normally possible when answering the question: "What should be learnt?" to consult numerous institutions and experts who can provide a relatively clear concept of the further education required by the target group concerned.

In the case of the courses dealing with certain theoretical subjects, on the other hand, a "need for learning" must first be created or stimulated. Teleac courses on polemology (the science of war and peace), nuclear physics, automation, space travel, and biochemistry are not intended primarily for people studying the principles of pacifism, political researchers, nuclear physicists, programmers, astronauts, or chemists, but rather for everybody who realizes that we are living in an age where developments in society and in the economy — as well as the psychic effects there of — play an important part, even if these developments are not always absolutely clear amid the excessive amount of information we are subject to. Quite often, the programmes present new topics and sciences that people never heard about at school. In such cases the programme committee at Teleac invariably requires expert advice.

b) *Trial programmes*

In order to support the preparation and production of a course both in theory and in practice, it is necessary to get in touch with the future "consumers" of the course at an early stage. In addition, it may also be of importance to hear the opinions of experts not involved in the preparation and developing of the courses (didacticians, psychologists, etc.).

In co-operation with the responsible didactician, director, and study advisor, the research department is concerned with the presentation, organization, elaboration, and application of the results provided by so-called pre-tests. It is attempted to create a test situation comprising all of the media to be applied in the compound, so that these media may be examined as regards their usefulness and feasibility. However, it should be pointed out that so far the Teleac group has only succeeded once in trying out such a compound in all respects. This was when the Spanish course "Vamos a ver" — which incidentally became a success — was being prepared.

The test persons for the pre-tests are either selected on the basis of certain criteria (e.g. in the case of a specialized course) or by placing advertisements in newspapers asking interested persons to take part. In the pre-tests, it is attempted by means of written and oral procedures conducted before and after the programmes to eliminate any mistakes in the course. During the discussions held with various experts (didacticians, learning psychologists and colleagues of the programme teacher), the same trial programmes are once again examined on the basis of the usual criteria. Both of these results often lead to the production of a new programme, and the feedback information is also taken into consideration for the presentation of the other lessons.

c) *Audience research*

Teleac also examines the response of the various audience groups to the individual courses. In so doing, it is distinguished between participants and "normal" viewers.

Participants are regarded as those persons who subscribe to the material accompanying the courses (books, records, etc.) and who sometimes even take part in the study group meetings held in conjunction to a course. "Normal" viewers, on the other hand, are people who have their television on while the programmes are being broadcast and who have watched more than half of the lessons.

In this research work, which has been carried out for six years now (1965–1971) following each course, Teleac applies a written questionnaire for asking the participants questions. As compared with the direct interviewing method, this procedure offers the advantage of enabling Teleac to reach the participants quickly and without incurring substantial expenditure (one day after the last television lesson has been re-broadcast). Nevertheless, one argument against this written questioning method is that the entire undertaking depends largely on the participants' willingness to fill in and return the questionnaire. Fortunately, Teleac has found that most of the participants were indeed prepared to do this. The number of participants who return the filled-in questionnaires to Teleac is quite considerable compared with most other written questioning projects of a similar kind: It is done by approx. 70% of the participants.

The questionnaires serve four different purposes:

- To determine the participants' actual behaviour (drop-out rate).
- To determine the way the student body is made up in terms of sex, age, standard of education, residence, etc.).
- To find out the participants' opinions on the presentation, contents, and style of the television course and the extent to which the accompanying material and the television lessons form the individual elements.
- To determine the extent or intensity with which the participants are interested in further courses or new courses that might be broadcast.

Naturally, this general questioning procedure does not suffice to determine the "yield" or "success" of a course.

d) *Expert panels*

In certain cases it is decided to organize an evaluation meeting with a number of experts after the course. Usually the experts present at these meetings are the same as those who took part in the pre-tests. The research department asks them to participate in the entire course and judge the programme output on the basis of various criteria laid down beforehand. During these discussions critical talks are held with the director of the programmes, the didactician, and the other members of Teleac's team. The reports drawn up by the experts are taken as the basis of these discussions.

e) *Results of the audience research (a few findings)*

- Most of the people who take part in the Teleac courses are male, with the exception of the language courses (Russian, French, Spanish) in which the majority of the participants are female.
- Courses dealing with subjects of contemporary nature (polemology, biochemistry, automation, space travel) attract a relatively large percentage of young viewers. This trend is also noticeable in the many specialized and vocational courses broadcast by Teleac.
- Compared with the nation-wide average, the participants in the "theoretical" courses dealing with certain subjects have a very high level of education. Here, 37%–49% of the participants have attended a secondary school (Dutch equivalent leading approximately to GCE "O" Levels), a university or a college, whereas the nation-wide average of persons with this educational background is about 5%.
- The usefulness of the accompanying material is rated the most positively in the case of the languae courses (records, workbooks, etc.).
- The drop-out rate is exactly constant: approx. 70%!

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11. Two special evaluation projects

1. More than half a year after the first written questionnaire had been sent to the people who took part in the "Export" project, a second study (i.e. a follow-up study) was carried out. The "Export" course was one of the two Teleac courses in which the participants were able to take an examination and acquire a diploma. The study was aimed at that group of participants who had passed this examination, and the purpose was to find out in which way the two groups of participants had been able to make use of the knowledge they had acquired since the course (e.g. using their knowledge in export work, taking part in other courses, etc.).
2. The second study that should be mentioned here was the first "Further education project for general practitioners". This was made up of a television course consisting of four programmes and an accompanying booklet. The procedure applied was as follows:
   - The first step was a *preliminary examination* carried out by asking doctors in writing what they thought should be done for the purpose of their further training, and how interested they were in a large number of possible subjects, broadcasting hours, and styles of presentation.
   - The second step consisted in a specific *study of attitudes* (also conducted before the programmes were broadcast), carried out by interviewing doctors as to their opinion on television.
   - The third step was made up of a series of *pre-tests* held among people against and in favour of the project (with persons having no knowledge of medicine, and persons with expert knowledge, and on the other hand doctors and persons having no knowledge of medicine).
   - The fourth step was the *written evaluation* of the four programmes in terms of audience response, formation of opinions, etc.
   - The fifth step was a *large-scale study* (carried out after the course) in which 670 non-experts/patients/viewers were interviewed as to their response, degree of discomfort, etc.
   - The sixth and final step was again a *large-scale study* in which doctors were interviewed as to the overall project and its implications both for doctors and for patients who possibly consulted doctors in view of the programmes.
     (The report on the entire study can be provided by Teleac in Dutch.)

12. The image of TELEAC

From December 23, 1968 – January 4, 1969 the research department of Teleac interviewed television viewers (more than 15 years of age) in the Netherlands to find out what they thought about Teleac.

For this purpose the viewers were asked some additional questions about Teleac, these questions being presented to the panel audience within the scope of the continuous television and radio interviewing process carried out in the Netherlands. The answers given by this group of persons provide an idea of what the population think about Teleac. Two characteristic aspects of the programmes are referred to very often:

a) The programmes are regarded as specialized programmes only interesting, useful, and necessary for a limited number of persons.

b) The broadcasting hours of the various Teleac programmes (both when broadcast the first time and when re-broadcast) are so inconvenient that many viewers are not able to watch the programmes at all.

All of the people interviewed stressed their positive opinion on the educational programmes offered by Teleac.

This favourable attitude is by no means always based on experience of the persons interviewed with certain programmes or courses, but is rather brought about by the general opinion "It's always good to learn something new".

13. The very inconvenient broadcasting hours

Most of the answers received from Dutch television viewers (and many talks with participants) show that it is the broadcasting hours of Teleac which meet with the most criticism: "It's really so bad that you can't watch the programmes regularly if you want to live a normal family life". "We usually switch off the television after the late news, and that's before Teleac starts. The programmes are too late for us. We go to bed then because my husband has to get up early in the morning". "Teleac is broadcast much too late for the people who go to work, at least for those who would like to watch the programmes."

14. Summary

Teleac has a good reputation among most viewers in the Netherlands. Thus, it may be claimed that the foundation fulfils a very useful and helpful task in the eyes of the public. This does, however, not necessarily mean that the Teleac programmes are watched very often or even regularly.

30% of the viewers questioned watch Teleac now and then or have watched a programme once. Typical viewing behaviour in the case of Teleac is to "watch the programmes from time to time", so that people do not watch various Teleac courses dealing with different subjects, but one single course which they just happen to be interested in or which offers them "something useful".

In other words, this means that people usually do *not* watch most of the programmes, but nevertheless regard them as useful because they are of interest to other people as a learning aid. In fact, this complies with the objective of the courses. The contents and the style of presentation of the lessons show that they are intended for a limited group of interested persons, for whom the material taught is helpful as they can use this material for their benefit.

The strict selection of the subjects to be taught with an eye on interested persons and the fact that the programmes are broadcast late in the evening are the reasons why the number of people who watch the Teleac courses is relatively small, and especially the number of steady viewers who watch the whole course from the beginning to the end. On the one hand the late broadcasting hours enhance Teleac's positive image, as irritation of interested viewers by uninterested viewers is avoided in this way, but on the other hand these late hours are a disadvantage for the persons who would like to learn about the subjects presented.

The future

Ever since it first started operating, Teleac has regarded its task as the duty to find an answer to the challenge given to us by the rapid development of science and technology in today's society.

However, as time goes by the question of whether it will ever be possible to reach this aim by means of an open programme concept is becoming more and more significant. It is mainly the projects carried out abroad (Open University, Télébac, Telekolleg etc.) which induce the responsible persons to take a mixed or a closed programme concept into consideration for the future. Moreover, the aspect of multi-media learning/teaching projects has become increasingly important in the work done by Teleac, and it is clear that methods incorporating a multi-media system require a degree of continuity that cannot be provided within a relatively short instruction course.

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Since January 1968 a group of Teleac personnel has been working together with a number of external specialists (teachers, sociologists, teaching psychologists, businessmen) in order to elaborate a so-called "basis extension plan". Three questions were taken as the starting point underlying these considerations:

1. Which groups are suitable for such an "extension of basis", and which group should be given priority?
2. What should the programme contents be?
3. Would a sufficient number of persons be prepared to enrol as students?

While attempting to find an answer to the first question in interviews with numerous experts representing various different fields, it became clear that the phenomenon of complex variables is a consequence resulting from a pluralistic and dynamic society. Naturally, the people who provide the advice and the people who make the decisions are not able to make allowance for all the variables. They are obliged to proceed from the basis that the variables not located in their own field of operation are constant. Otherwise the result would be n-times the conditional evidence, which could only be examined closely enough by using a computer. (If . . . and if . . . and if . . . etc., etc. . . . then . . . then . . .)

After the experts involved had made a great many statements of this kind, considerations such as that described above created a new frame of reference. Finally, a completely new basis extension plan was developed within this frame, taking the following factors into consideration:

- *The various different revolutions of our days* (the methodological, the scientific, the technological, the socio-political, and the cultural-religious revolution)
- *The constant change in our surroundings* (the absolute welfare and prosperity problem)
- *Programming*
- *Instruction in a playful manner.*

The result of this approach was that the many *subjects* which constituted a large section of the original basis extension plan (the working title applied then was basis widening plan), such as

- Dutch
- English
- Mathematics (Algebra, Geometry, etc.)
- Mechanics
- Physics
- Chemistry
- Biology
- Statistics
- Sociology
- Politics and Modern History

were replaced by projects such as

- Learning to think in new symbols
- The elementarization of modern science
- The technical revolution
- Our changing society
- A new concept of the world.

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In September 1971 Teleac started the preparatory work on a pilot project intended to serve as a model for the large basis extension project. It is planned to begin with the Teleac project in the 1972/73 term, following an introductory phase and accompanied by a great number of evaluation studies.

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A Survey of the Teleac Projects from 1965—1971

Year	Course	No. of lessons	No. of participants	No. of viewers
1965	Accidents at home or nearby	16	3,516	1,440,000
	Modern teaching methods and didactics	16	*	360,000
	Study information I	3	*	330,000
	Our food	6	*	240,000
	A knowledge of textiles	11	3,804	480,000
	From the measuring stick to the measuring clock	11	1,226	65,000
	Living together today and tomorrow	20	2,574	240,000
1966	Study information II	9	*	240,000
	A breakdown on the road	12	60,000	504,000
	The Attic tragedy	17	4,600	119,000
	Logics	11	8,500	105,000
	Let's play some music	8	1,025	98,000
	A farm as a commercial enterprise	14	*	245,000
	Programmed instruction	16	1,800	70,000
	Nuclear physics	37	3,460	119,000
1967	Study information III	1	*	88,000
	Automation	36	7,774	60,000
	The retail dealer as an entrepreneur	15	2,150	72,000
	Russian	36	14,390	96,000
	Polemology (the science of peace)	20	*	60,000
	Go on building in winter	6	820	80,000
	Study information IV	4	*	unknown
1968	Man in space	11	1,450	100,000
	Problems of the intermediate year	10	2,200	72,250
	University and college	5	*	204,000
	Television activities	2	*	375,000
	Measuring and comparing	10	1,744	229,000
	Listen to what I say	18	3,754	204,000
	Notes and sounds	25	10,219	221,000
	En France avec Nicolas	30	23,971	272,000
	Export	18	2,274	127,500
	The new turnover tax system — value-added tax	13	*	433,500
	University and college	5	*	56,000

Year	Course	No. of lessons	No. of participants	No. of viewers
1969	Growing vegetables under glass covers	12	*	187,000
	Living mathematics	7	3,038	161,000
	Films in secondary school teaching	9	725	170,000
	Statistics	19	3,650	195,500
	Playing chess	15	12,000	527,000
	Living philosophy	12	5,000	144,500
	Prehistory	10	3,500	314,000
	Organizing and leading groups	13	9,000	187,000
1970	The methodics of citizenship	12	2,100	117,000
	Spacial order	14	1,389	162,000
	Good health	20	1,800	158,000
	From molecules to mankind	20	4,000	234,000
	Spanish (Vamos a Ver)	20	26,800	189,000
	Further training for general practitioners 1	4	**	102,000
	Playing draughts	18	4,267	255,000
	English (The Seventh Key)	5	4,761	144,500
	The implication of models in science and technology	12	1,076	68,000
	Biovision	4	1,761	51,000
	Assembly techniques and group discussions	9	5,964	102,000
	Our agriculture today and in the future	16	7,734	84,000
	Further training for general practitioners 2	4	2,200	221,000
	En Français	20	10,138	165,000
1971	Television for teaching and instruction	7	*	70,000
	Mathematics: Surfaces, contents, and tangents	11	5,014	80,000
	Building and living	16	2,435	90,000
	Astronomy	14	4,677	100,000
	Studying	8	*	68,000
	First aid in accidents	15	3,582	400,000
	Further training for general practitioners 3	4	978	85,000
	Elementary economics	15	***	***
	Technical English	13	***	***
	Traffic	8	***	***
	Further training for general practitioners 4	4	***	***
	Studying II	8	***	***
	Esperanto	20	***	***

* These courses were not accompanied by written material.

** All the general practitioners in the Netherlands received the written material.

*** Not yet known.

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Poland **Politechnika Telewizyjna**

I. General Facts

The structural changes in the Polish social system and the necessary re-formation of Poland's economy have led to a continually increasing need for executive and management personnel, which in turn results in new demands made of the educational facilities at university level.

In spite of the growing number of university graduates (and the expansion of the capacities presently available), it can be forecasted that the existing facilities will meet only 80% of the need of the economy between 1971 and 1975.

In view of this shortage and in accordance with the generally acknowledged principle of equal educational possibilities for everybody, the Polish government initiated an organization for extra-mural educational facilities in 1948.

These courses in further education, which are run by the universities or the technical universities, consist mainly of evening or correspondence courses. Anybody can participate who holds the required qualifications and has been in employment for at least 1—2 years, according to the subject in question. Participants must have the permission of their employer, as the employers contribute greatly to enabling the students to participate. Every employee participating in a correspondence course is entitled to 21 additional days off from work with full pay, so that he can attend the group meetings organized by the universities. The employer must also pay for the travelling expenses to and from the university meetings. Similarly, participants in evening classes are entitled to 14 paid hours off from work every week. In addition, they receive a paid holiday, in order to prepare and sit for the exams.

The number of people in employment participating in these courses is very high. However, this educational facility for people in employment has met with certain difficulties:

- The number of qualified teachers is far too small to cater for the needs in the field of university education.
- The network of evening class institutions is not dense enough, and the establishment of consultation centres is often impeded by the shortage of suitable teachers.
- Correspondence courses present the students with substantial difficulties; their motivation tends to decrease rapidly, so that the number of drop-outs is very high.

This situation, which prevails in the entire field of university education, is especially noticeable in technical studies. On the one hand, this faculty represents the nation's most urgent need for improvement, on the other it arouses great interest among the employed public. Consequently, approximately 40% of the employees wanting to commence studies in a technological subject have to be refused every year, owing to the lack of places and teaching staff.

These limitations, which are induced by the traditional teaching methods, lead to a search for new techniques to fill the existing gaps. Television, for instance, has already proved its importance as an ancillary pedagogical means in elementary teaching and further education, and it is thus quite clear that attempts have been made to gain the cooperation of TV in technological studies at university level.

II. The Development and Aims of Politechnika Telewizyjna

In 1965, the Minister of University Education appointed a working party to design a system for the application of television in extra-mural further education in technical subjects. He was stimulated to do so by the Polish television authorities. Moreover,

the situation was improved through the introduction of a uniform curriculum for the first two years of technical studies at university level. This uniform curriculum is constituted by the course "Fundamentals of Technology", which represents a joint basis for all specialized courses.

UNESCO played an important part in this stage of planning, as the organization showed great interest in the project. A convention was drawn up between the government of Poland and UNESCO, according to which UNESCO is prepared to support the project with technical equipment and to publish evaluation reports on the project.

After the said convention had been made, the Minister of University Education appointed a commissioner to examine the possible usage of television in university education.

The aims of the project were formulated in the following way:

1. Television is to be incorporated into the first two years of technical studies in the framework of the extra-mural system, i.e. into the course "Fundamentals of Technology".
2. The function allocated to television is to have several aspects:
   a) to supplement the teaching facilities provided by the evening courses, presenting the most difficult subjects and in this way elaborating the course for the students;
   b) to provide the correspondence course students with lessons substituting normal classroom teaching. The three-day school sessions, in which the students must participate three days a month at the technical universities, could then assume a more facultative character, thereby eliminating the tiring journeys the students have to make;
   c) to demand a definite rhythm of work on the part of the students, and to induce them to study more systematically;
   d) to promote the participants' motivation, in so doing cutting the number of dropouts.

   Television also enables prospective participants interested in the courses to appraise their ability correctly, as they can follow the courses without being forced to enrol or to admit that the material presented was too difficult, so that they had to give up.
3. The educational situation is to be promoted by means of the multiplication effect of television, the programmes of which can be received by 80% of the population of Poland. Many employees living in areas too far from the next university, who were therefore not able to take part in further education courses, can in this way nevertheless continue their education at university level. Thus, this enterprise corresponds to the principle of equal educational possibilities for all.
4. It is important to arouse the interest of large segments of the population and to reach a higher standard in the subjects treated. It is assumed that the projects also appeal to a large marginal audience.

III. The Organizational Structure and Execution of the Projet

The execution of the project was prepared jointly by the Ministry of Education and the State Committee for Radio and Television. Whereas the Ministry is responsible for the contents of the courses, the accompanying material and the organization of the viewing centres, the State Committee for Radio and Television, which is represented by the Department for Educational Programmes, assumes the production and trans-

mission of the courses. The entire project is co-ordinated by the commissioner for the usage of television in university education, who acts on behalf of the Ministry. The commissioner is assisted by an advisory board consisting of 12 experts, some of whom represent the governmental departments participating in the project. The other members are professors with experience in adult education, representatives of the television authorities, and a permanent secretary. The board convenes to discuss all questions relating to the application of television in technical studies.

Apart from this advisory board, groups of experts are assigned to develop the programmes and the contents of the subjects presented on television. Furthermore, these groups make suggestions pertaining to professors and specialists thought suitable to give the courses. However, the final decision as to engagement or non-engagement is left to the television authorities.

During the planning and production stage, the Inter-University Institute for Research in the Field of University Education was requested to examine the methods to be used for the TV courses and the contents of the programmes. For this purpose the institute formed a study group, the members of which are sociologists, educationalists and psychologists. The examination itself was intended to provide information on the following aspects:

1. The advantage of television teaching, as seen from the viewpoint of the student.
2. The objectivation of the results (varying grades in exams).
3. The level and the mode of presentation of the television courses.
4. Possible differences in opinion between the professors and the organizers of the television courses.
5. Groups of the audience viewing the television programmes, other than the regular students.

In order to facilitate the examination and to help the teachers to integrate components of the television courses into the courses for people in employment, the department for technical studies in the Ministry of Education has set up 15 consultation centres in some of the largest factories in Poland. This step was taken in agreement with the institutions for university education. The Ministry of Education equipped the consultation centres with TV sets, and the universities in the respective provinces appointed professors to teach there.

Two difficulties were encountered regarding this project: First, the shortage of recording devices compels the professors to be present at the broadcasting studios for all programmes and repetitions which are broadcast live. Second, the technical means and facilities offered by the Warsaw radio and television station are insufficient: This station is not able to take over the transmission of the programmes, so that they have to be broadcast by the regional stations. Accordingly, the TV station in Wroclaw, which is the Polish centre for mathematics, broadcasts the courses in this subject, whereas the other subjects are transmitted by stations located in the university towns of Krakow, Katowice and Gdansk.

IV. Conditions for Participation

The conditions underlying participation in the television courses are the same as for other forms of university education for people in employment. Candidates must have passed the Polish equivalent to the GCE "A-Level" (Junior College Leaving Certificate) in the mathematic subjects, they must further have been employed full-time for at least two years in a profession linked with their future studies, and they must have their employer's permission to take part. This last requirement gives the participant the right of claiming the paid holiday for study purposes mentioned before, which is stipulated by law.

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Candidates are advised to register at the nearest university organizing the correspondence courses. Nevertheless, persons who have not enrolled still have the possibility of sitting for the exam held at the end of the first year, which makes it possible for them to enter the second year.

V. The Structure and Contents of the Courses

A. The "Small Pilot Project" (February to June 1966)

The pilot project as such was preceded by a series of experimental courses, here termed the "small pilot project". This "small pilot project" was aimed at examining both the teaching methods and the production methods. It did not deal with the material treated in the forthcoming two-year course for technical studies at university level, but was concerned with the material treated in the exams which the candidates for technical universities must pass on enrolling. In other words, this was physics and mathematics at GCE "A-Level" standard.

The courses were broadcast from February to June 1966, in a sequence of one 30 minute programme a week in each subject. All these programmes were broadcast twice, on the one hand to avoid difficulties in schedule, on the other hand to give students progressing more slowly the possibility of repeating the material presented. Thus, the entire curriculum was made up of 20 lessons each in mathematics and physics.

The project was announced to the potential participants on television, which broadcast a bulletin on the future courses and their purpose, and regularly made announcements after the news. Thus, interested persons were able to acquire the accompanying material from the suppliers of the correspondence course books. This material consisted of two manuals on physics and mathematics, published by the Press for Science and Technology for usage at technical universities. In addition, this publishing house provided a "Guide for Persons Wanting to Enrol in a Further Education Course for People in Employment", which contained information on the television courses, on the conditions for enrolment in extra-mural courses, a list of the existing courses and the design of their programmes, practical advice, a summary of the knowledge in mathematics and physics required for the enrolment exam, and the detailed curriculum and schedule of the television courses. This manual was mailed to all interested persons at the beginning of January 1966.

Furthermore, the students had the possibility of participating in group work in one of the viewing centres under the supervision of a tutor, apart from having the benefit of the TV programmes and the accompanying material. In this group work, the tutor first viewed the programmes together with the students and then gave a 45 minutes lesson devoted to answering questions and clarifying difficult points. The tutors, who all have experience in adult education, are recruited from the ranks of academic assistants at technical universities.

The number of participants in the "small pilot project" exceeded all expectations, and 56,000 people purchased the students' guide.

Naturally, this project was purely experimental and was merely intended to eliminate in advance certain sources of error that might occur in the actual pilot project.

An extensive survey was conducted parallel to the preparatory courses run on television, the results of which we shall deal with in another part of this report.

B. The Actual Pilot Project (1966–1968)

The actual pilot project, i.e. the usage of television for broadcasting the curriculum of the first two years of technical studies at university level for people in employment, was launched, as planned, in September 1966.

The public was informed hereof through several channels. The television authorities organized discussion sessions with representatives of the Ministry of Education and of television, apart from the announcements made on TV after the news. These discussions were intended to explain the purpose and advantages of the project, and to describe the conditions for participation. The regular announcements were also broadcast by radio. Factories took part in the promotion campaign by putting up posters and distributing information brochures. Furthermore, articles were published in various newspapers, and the "Technical Journal" agreed to publish the programme of the courses every week. As mentioned, the responsible authorities did by no means intend to broadcast the complete curriculum of the first two years of the course "Fundamentals of Technology", especially as the broadcasting time available was not sufficient for this purpose. They intended rather to limit the television transmissions to the most difficult subjects, which could otherwise only be mastered by the students of traditional correspondence courses with utmost effort and which had proved most difficult for the less experienced evening class teachers. Accordingly, two subjects otherwise compulsory for the courses run in the first year of studies, namely economics and foreign languages, were not included in the television programmes.

The curriculum and its various components were split up in the following way:

1. *The Television Courses*

   In the first term, these courses included 45 lessons in mathematics, 16 in descriptive geometry and 16 in chemistry. In the second term, the courses consisted of 39 lessons in mathematics and 54 lessons in physics.

   This curriculum was repeated in 1967/68 together with the courses of the second year of technical studies. These courses consisted of 54 lessons in mathematics and 36 lessons in physics in the third (half-year) term, and 24 lessons in physics, 27 lessons in the strength of materials and 30 lessons in electronics in the fourth term. The contents of these programmes was determined by specialized groups in the Ministry of Education. The groups provide the respective professor with the subject matter of each course and a short summary of the material to be presented. The professor, in turn, has the task of developing the course and establishing contacts with the people and offices making the illustrative material he requires for his programmes.

   The teachers giving the courses are outstanding scientists, but do not in general have any knowledge of the specific possibilities of presentation offered by television. Thus, the professor is required to resort to the advice of a television producer or an expert on audio-visual techniques.

   This elaborate preparation is the reason why a professor is hardly ever able to give more than 10 television programmes per term. However, the courses were split up into "blocks" in order to avoid an imparity in the learning effect induced by too frequent a change of professors. One block is always given by one and the same professor. In addition, the television producers are required to make a series of courses as homogeneous as possible.

   In order to make the professors acquainted with their new method of work, the television authorities hold meetings when the first programme in a given subject is broadcast, in which all professors lecturing in the subject in question participate. After having viewed the programme, they can discuss various points of the method of presentation with the professor who gave the lecture.

   As we already stated at the beginning of this report, Polish TV did not have the necessary technical means to record the programmes. Consequently, the professors had to go to a studio to give their course live. They are therefore obliged to appoint a substitute who could give the course in their stead, so that mishaps due to illness or other factors are avoided.

On weekdays, the programmes lasting for an average of 30 minutes are re-broadcast the same evening: They are first broadcast in the afternoon, when people in employment have already finished work and can thus view the course. Then they are repeated late in the evening. Courses transmitted on the weekends are not re-broadcast.

After the courses had been revised, Polish TV was in the second year of operation (1967/68) and able to start recording some of the courses presenting the material of the first two terms. The advantages offered by such recordings are obvious: The professors do not have to be present in person when the programmes are broadcast, the copies of the films can be placed at the disposal of the technical universities for their day courses, and the economy of the project is increased, etc.

Let us come back to the contents of these programmes: We have mentioned that television only broadcasts some of the compulsory subjects within the framework of the "Fundamentals of Technology" course, and that it is limited to the most difficult points in these subjects. In fact, the TV courses only provide 30% to 80% of the material treated in the courses. Thus, there can be no doubt that the courses must be supplemented by other teaching methods.

2. *The Accompanying Material*

This material has several functions and can thus be split up into various categories:

a) The manuals offer the entire material presented in a subject, in this way supplementing the television lessons.

The television courses necessitated absolute standardization of the manuals. Thanks to the great propagation of the manuals, it was possible to assign a centralized publishing organization with the production hereof, namely the PWN (State Press for Scientific Literature). The manuals do not, however, serve solely to supplement the television lessons, but also contribute to uniformity of a course series in one subject, despite changes within the teaching staff.

The students can either buy the manuals in bookshops or straight from PWN.

b) The programme scripts are published whenever the text in the manuals deviates too greatly from the actual lesson.

c) As it is not possible to provide more than model exercises in the programmes themselves, and as only examples of the solution methods for the exercises can be given, it has proved necessary to supply the participants with exercise books together with a key.

By means of these books the students are able to study actively and check their progress themselves. The students, are required to subscribe to the exercise books, which are distributed by the bookshops.

Nevertheless, this self-checking factor can by no means replace group activities, in the course of which the participant benefits from explanations, advice, and corrections provided by the teacher.

3. *The Group Activities*

The authorities responsible for the project are of the opinion that the best possible form of application of the television courses is its integration into the *evening courses* for people in employment. However, the application of this method is opposed by numerous difficulties: it is only profitable for persons living near a university. Furthermore, there are not enough teachers to meet the need of comprehensive evening courses.

However, other forms of participation are also possible, which differ mainly by the intensity and frequency of group work.

- The best results have been achieved in the consultation centres set upon on the premises of factories. Here, the participants view the programmes in groups. In this way, they can derive a profit from supervision by a qualified teacher, and can elaborate the knowledge acquired immediately after the programme has been broadcast.
- The consultation centres also organize seminars for the isolated students, which last for an average of three days. As the students are entitled to three days holiday a month, they are then able to clarify all doubts, which may possibly have arisen in the course of the preceding weeks.

4. *The Correspondence Course*

As, however, this periodical help proved insufficient to effectively support the efforts of the isolated students, the universities have established correspondence courses for them. We have already stated at an earlier point that correspondence teaching represents a substantial element in the endeavours to institute a teaching system for adults at university level.

In future, correspondence courses are also to be supplemented by radio programmes dealing with subjects requiring a lesser visualization effect.

It should not be forgotten at this point that the students in the first two terms are not obliged to enrol officially for the courses, and can thus view them without participating in the correspondence courses or the group activities. Nevertheless, this method does not appear to shed any satisfactory results, except in the case of very talented students. Such students are then able to sit for the exam at the end of the year, and to enter straight into the second year.

5. *The Examinations*

Students watching the television course "Fundamentals of Technology" must take the same examinations at the end of the year as their counterparts attending technical universities. These universities are responsible for the organization of the exams. The students must go to the nearest university in order to sit for the exams. The exams are made up of a written and an oral part. Participants having passed can move up to the following year of study. In this way students having completed the two-year TV course "Fundamentals of Technology", can continue their studies at a technical university and receive their engineering diploma after two more years.

C. *The Expansion of the Project*

The experience made during the first two years of the television courses has shown that a number of persons meeting the conditions for enrolment, who would like to take the entrance examination for courses at technical university level for people in employment, must first refresh their knowledge of mathematics and physics by attending preparatory courses so that they have a reasonable chance of success. It should be noted in this respect that almost all the candidates passed the Polish equivalent to the GCE "A-Level" (Junior College Leaving Certificate) several years prior to enrolment. Moreover, some of them did not attend a secondary school specialized in mathematics and physics and must therefore catch up with their backlog in these subjects. Another factor which cannot be overlooked is that it is an aim of courses in further education for people in employment to offer the working class the possibility of at-

taining higher education, from which they had hitherto not been able to derive a profit for various reasons, such as lacking motivation, etc. However, it turned out that the standard of these candidates is often lower than that of the others, which is not due to their social origin but rather to the fact that schools in small communities do not have as good a teaching staff as those in large towns. This obviously results in shortcomings, which often lead to failure or at least poor results in the entrance examinations of the technical universities.

For this reason, preparatory courses are run regularly by various organizations. However, the rate of success is still low (approx. 20%), as the candidates do often not have enough time to attend these evening classes. In consideration both of these various factors and of the experience gained through the "small pilot project", the Ministry of Education decided in agreement with the State Committee for Radio and Television to broadcast television courses beginning parallel with the 1968/69 school year, which prepare candidates for the entrance examination of the technical universities. This preparatory curriculum consists of 80 courses both in mathematics and in physics. Most of the young people in the last few classes of secondary school also take part in these courses in order to prepare for the university entrance examinations. In fact, the courses are of special interest to young people attending secondary school in small communities where the standard of teaching is frequently lower than to be found in the large towns. Meetings of the participants taking place once a month have also been provided for, so that they have the possibility of receiving additional explanations from the teacher supervising these meetings.

An intermediate examination is scheduled for the end of the first term.

VI. The Evaluation of the Various Projects

We already mentioned at the beginning of this report that the Inter-University Institute for Research in the Field of University Education has been assigned to evaluate in detail all the stages of the project. Some of the results of this evaluation are already available as a UNESCO publication. (See Reports and Papers on Mass Communication No. 55 Television for higher technical education of the employed, A first report on a pilot project in Poland, Paris 1969.) A final survey is in preparation and will be available in 1972.

A. The "Small Pilot Project"

This evaluation took the following factors into consideration:

a) the sociologial composition of the television student body

b) motivation and counter-motivation

c) evaluation of the programmes and the television teaching methods

d) the degree of effectiveness of television teaching.

Several inquiries were made within the various stages of the project by means of questionnaires: Initially, these were sent to all the purchasers of the guide (57,864 persons), and then to sample groups of participants. The representativeness of this selection may be queried when considering that only a certain percentage of the persons receiving a questionnaire did, in fact, fill in and return it. However, a comprehensive analysis of the results can eliminate these doubts and permit generalization of the conclusions drawn.

1. The Sociological Composition of the Student Body

Of the 57,864 persons who ordered the guide, 38,981 (equaling 67.4%) had the qualifications required for participating in a course for technical studies at university level.

Of the 38,981 qualified persons, 36,106 lived in towns (of which some 50% lived in large towns) whereas 2,875 lived in rural areas.

A second survey related to a group of 5,686 potential candidates. This survey shows that a majority of the candidates work in industrial enterprises (67.9%), and that the rest are divided into professional groups such as: Agriculture and forestry (3.1%), trade (1.6%), teaching, science and culture (5.2%), health matters (1.1%), administration, political organizations and associations (6.4%), and other sectors (11%). 3.7% of the people questioned did not make any exact statements as to their occupation. Most of the candidates, i.e. 53.2%, were between 30 and 39 years old, 32.5% were between 21 and 29, and 13.7% were 40 or more. 0.6% of the selected group of candidates did not state their age.

All candidates must have the Polish equivalent of the GCE "A-Level": A large number of the people questioned had passed this exam 12 years or more before starting the courses (42.1%), 26.1% had passed between 8 and 11 years earlier, 16.0% 5 to 7 years before, and 15.5% 3 to 4 years earlier.

From an ecological viewpoint, it is interesting to compare the places of birth and residence of the participants: 39.4% were born in rural areas, but only 10.8% still live there today. 38.7% lived in towns with more than 100,000 inhabitants, 23.7% of the students lived in towns with 20,000 to 100,000 inhabitants and 27.1% lived in towns with a population of less than 20,000.

A survey conducted on the basis of another sample group of participants showed that 92.1% were male, 79.5% were married, and 70% had at least one child.

In addition, 36.7% of the people questioned stated that their parents had an incomplete elementary school background, 49.3% said that their parents had completed elementary school, 5.2% started that their parents had attended, but not completed, secondary school 5.7% of the students had parents with a completed secondary school education, and only 1.3% had parents with a university background. 1.8% of the people questioned made no statements.

48.9% of the candidates questioned were working in a position superior to that of an advanced technician, 30.6% were technicians or on the same level, and 13.1% were below this standard. 5.2% were employed in a position normally limited to university graduates.

2. *Motivation*

In the course of the surveys, questions were asked in relation to the motives inducing the participants to continue their studies despite the existing difficulties. The results hereof underlined the significance of social motivation. The desire for greater social security takes first place; it was named by 76% of the people questioned. 64.2% participated in hope of a more interesting occupation, 48% in hope of a higher income, 46.7% in order to reach a higher social standing, and 36.2% participated to expedite their vocational advancement. These figures were confirmed by the answers to a second question, which placed motivation in a more personal light.

The evaluation of the counter-motives merely confirmed the role television can possibly play in the field of extra-mural education for adults. The majority of the people questioned gave the following arguments in opposition to participation: lack of time, and their incapacity to study consistently after such a long break. Television, which saves the participant unnecessary journeys and compels him to adhere to a definite rhythm of work, is suited to eliminate these counter-motives to a great extent.

3. *The Students' Opinion on the Teaching Effect of the Television Courses*

The various surveys conducted showed that almost all of the participants were satisfied with the broadcasting times of the courses. A few of them viewed both the course and the re-broadcast (13.1%).

The majority of the students were not able to exploit the benefit of group viewing or group work in consultation centres (73.3%). However, most of them had wished originally to profit from this method of elaborating knowledge in a given subject (60.7% of the students working at home).

An opinion poll relating to four programmes taken from the framework of the entire course indicated that 90.4% of the students termed the topic of the programmes as "well-selected", and 87.2% of the participants stated that the programmes "helped them to understand the problem better". A very small group considered the courses to be worthless (5.9%), or did not receive the support they had hoped for (8.4%).

The rhythm of the courses was appraised less favourably than their contents: 64.4% of the participants were of the opinion that the rate of progression was correct, whereas 23.4% said it was too fast.

In respect to the length of the programmes, 67.5% of the students stated that they were too short, while 27.7% considered them to be exactly right. A few people (0.6%) said that a programme lasting 30 minutes was too long.

These statements vary according to the students' respective viewing situation. Students watching the programmes in groups regarded the standard as satisfactory, but considered progression to be too fast and the programmes too short to allow a genuine profit to be derived from the exercises offered.

A survey conducted as to the opinion of the TV students on the teaching effect of the television programmes showed that the students profit more from the clear and understandable treatment of a question (56.3%), and from practical demonstration (59.9%), than from the personality of the professor (29.2%). A more precise analysis has however made evident that the students do apparently not only derive an advantage from the way in which a question has been treated, but that the fact that this question has been depicted in a better way helps them a great deal. The overall percentage of students who gave this answer was 40.4%, of which 23.1% stated only this specific factor. This makes it clear that the personality of a professor does indeed form an important element for the success of the television programmes. It is also interesting to note that the isolated participants have a better opinion of the didactical value of the programmes than the group participants.

4. *The Impact of the Television Courses on the Degree of Success in the Entrance Examinations*

A survey was carried out among a sample group of 721 candidates, of which 92.4% were male. All of them were more than 19 years old; the largest group was made up of 23 to 26-years-olds (30%), followed by the group of students of 30 years of age or older (24%).

Contrary to expectations, it proved impossible to determine a direct relation between participation in the television course and success in the exam: 68.1% of the candidates having viewed the courses passed the exam, as compared to 67.1% of the candidates who did not participate.

It would, however, be premature to assume that the television courses have no influence whatsoever on effective preparatory work for the exams. The students themselves have confirmed the effectiveness of television in this respect. Nevertheless, the final result of the preparatory work is not determined by the TV courses alone, but also by the lapse of time between leaving secondary school and starting to study, by the intensity of the students' personal efforts outside of the television course, and by other factors.

This was the reason why older students, who had a profession taking away a lot of their time and energy, only achieved relatively poor results despite the help of television, whereas the results of younger and less talented students were influenced positively by the television courses.

B. The Actual Pilot Project (First year of study)

The Inter-University Institute for Research in the Field of University Education also conducted surveys and evaluations similar to those described above, in connection with the actual pilot project. These surveys were supplemented by the inquiries as to the marginal audience of Politechnika Telewizyjna, which were made by the Research Centre for Public Opinion and Programme Evaluation. The results of this evaluation are as follows for the first year of the courses (1966/67) — while the final figures cannot be provided until the ultimate report planned for 1972 has been published:

1. The Sociological Composition of the Student Body

A great number of the participants were recruited from the rural population or the working class (72.6%).

Just under 10% of the student body was made up of women, two-thirds of whom were not married. By comparison, half of the male participants were married.

The largest group was that of the 20 to 25-year-olds (42%), 25% of the students were 25 to 30, and 28% were more than 30 years old.

About half of the participants (50%) lived in towns with more than 100,000 inhabitants, only 80% lived in rural areas, and 16% in towns with less than 20,000 inhabitants. It is, however, interesting to note in this connection that 40% of the students were born in rural areas.

Surveys concerning the standard of education of the parents led to the same results as in the "small project". (Approximately 79% had only an elementary school background, either complete or incomplete.)

However, all students naturally had the equivalent of the GCE "A-Level" as this is required for participation. 80% had "A-Levels" in technical and mathematical subjects, and only 20% had "A-Levels" in Humanities or modern language subjects. In addition, 30% of the participants questioned had finished their secondary education with the help of evening classes or correspondence courses. 55% of the students passed the secondary school leaving exam (cf. "A-Levels") 2 to 5 years before entering the courses, and 25% left school more than 10 years earlier.

Breakdown into professions is similar to that in the "small pilot project". 18% of the student body held a position not necessarily requiring secondary school education. 50% had a position for which secondary school education is sufficient, 25% to 30% were occupied in professions for which university education is desirable, but not absolutely necessary, and 5% held a position for which such a background is required.

The conditions under which the the students study at home are termed as "satisfactory" by 40%, "acceptable" by 45%, and "average" by 15%. In this connection it should be noted that 75% of the participants had a television set of their own.

2. *Motivation*

This point was already dealt with in the surveys regarding the "small pilot project".

3. *The Function of Television as One of the Carriers of Technical Studies at University Level for People in Employment*

Only a few of the technical universities have adapted their schedules to the television courses, so that the majority of regular university students wanting to derive a benefit from the programmes must watch them in the evenings (11 p.m.) or on weekends.

Only 20% of the people questioned viewed the courses in consultation centres, which is mostly due to the small number of these centres. However, of these 20%, 70% attended the centres for all courses.

It is interesting to note that 68% of this group of the student body stated that they would probably not have been able to follow the courses without the help of a tutor.

The number of students attending the centres dropped greatly on Sundays, which appears to be due to the fact that the participants wanted to spend this day with their families. Therefore the TV lectures were from then on only broadcast on weekdays.

Of the other students, only 50% regularly attended the seminars organized by the consulation centres, which were usually held in schools on weekends.

4. *Participation in the Television Courses*

Only 10% to 15% of the students viewed the TV courses systematically, whereas 30% to 35% watched the programmes in certain subjects regularly. 40% to 50% of the people questioned only watched the courses now and then, while 5% to 10% admitted that they never did so. However, it appears that irregular participation is to be found mainly among evening class students, who participate in traditional direct lessons.

Furthermore, the participants living in rural areas or in towns with less than 20,000 inhabitants, and the single students, view the programmes more regularly than the other groups. This also applies to students over 30 years of age. It has also become clear that students with a good "A-Level" pass study better than the others, which is evidently due to greater motivation.

Naturally, numerous other factors also affect regular participation in the television courses (profession, personal conditions, etc.), but the surveys carried out so far do not allow any concrete statements on these points to be made.

5. *Appraisal of the Television Courses by the Students*

A survey has made it possible to determine the role allocated by the students to the various elements and factors which are of significance within the framework of the courses. This survey showed that the participants considered the following factors to be absolutely necessary in order to reach high quality courses: good and

clear speech of the professor, a clear sequence and illustrative presentation of the problems, and practical examples of the solution methods to be used for the sample exercises. The most frequent objections, which were even made in the best courses, related to progression, which does not follow that of the technical universities and was often termed "too fast".

6. *Preparation of the Television Courses*

The students must prepare the TV courses systematically, in order to derive the greatest advantage from them. Nevertheless a survey has shown that most of the students never prepare for the television courses (52%), or only do so now and then (35%). In other words, only 13% of the participants do prepare for the courses systematically. The factors influencing regular preparation are the same as those which occurred in the participation in the courses. In this connection it must not be forgotten that 38% of the students stated that they revised the programmes immediately after they had been broadcast, with the help of the manuals. 43% of the participants did the same on the following days. Only 21% did not start work until shortly before the examination took place.

7. *The Degree of Effectiveness of Television Teaching*

The results of the surveys pertaining to this point have shown that the students who followed the TV lectures systematically had much better examination results.

8. *The Marginal Audience in Technical Studies at University Level, Broadcast by Television*

The Research Centre for Public Opinion and Programme Evaluation has carried out several surveys in order to determine the exact number of television course viewers and the composition of the audience.

It is assumed that a large marginal audience averaging 170,000 persons, watched the courses either occasionally or regularly. This audience can be split up into the following groups: Teachers, technicians, engineers, and scientists, who all watched the courses in order to refresh their knowledge or to acquire new technical know-how. In addition, there are the students and pupils of technical universities and colleges, who viewed the courses in order to support their studies.

C. *The Actual Pilot Project (Second year of study)*

In June 1970 the Inter-University Institute for Research in the Field of University Education completed the report on the television course held in the 1967/68 study year for the second year of study:

The Participants

Of the questionnaires sent to 5,580 participants, who had already received questionnaires on the television programmes broadcast in the first year of study, 1,982 (36%) were returned filled-in. Most of the answers were received from students who were currently in the third year of study (84%), while some were sent in by students repeating the second year (12%), and a small number came from drop-outs (4%).

58.8% of all the students questioned were attending evening courses and 40.3% had enrolled in correspondence courses, whereas the others did not make any statements in this respect. 24% of the students taking part in technical courses of some kind were studying mechanical engineering (this was the largest group), 20% were studying

electronics, and 10.9% structural and civil engineering. 92.3% of these students were male and 7.1% were female. In terms of professions, 78% of the students were employed in technical plants, 8% in design offices, 3% held relatively high administration positions in the industry, and 5% were teachers at colleges and other educational institutes.

Participation in Television Courses

Most of the students (91.5%) had television sets of their own. Only 8% watched the courses in the consultation centres, while 1.9% of the students who attended these centres viewed the courses elsewhere in some kind of group. 22% regarded the aid offered by the study advisors as a decisive factor, 49% believed this aid was useful, and 14% considered it to be superfluous.

Like the students in the first year of study, only a small number of the students questioned really watched the courses systematically. In mathematics, this group of systematic viewers constituted 10.3% of the total student body, in physics 7.1%, in the strength of materials 3%, and in electronics 2.6%. 10 to 15% of the students watched the television programmes in certain subjects only, these subjects primarily being mathematics and physics. On the other hand, 20 to 30% of the students did not watch the programmes at all, while the remaining group watched them from time to time.

The principal reason given by the students for not watching the television courses was that the broadcasting times were inconvenient: 28% said that the afternoon programmes were too early and the evening programmes too late for them, 12% stated that they did not have a television set, and 24% of the evening course participants criticized the fact that the television courses had not been co-ordinated to fit together with the evening courses in terms of broadcasting hours.

The Students' Appraisal of the Television Courses

Here, the opinions voiced corresponded to those stated in connection with the first year of study.

Preparation for the Television Courses

Most of the students participating in the course regularly and even the majority of the students who did not watch the programmes systematically, did by no means confine their work to merely watching the programmes passively: 10.7% read a relevant part of the accompanying material prior to the programmes, and 24% did so after the programmes. In addition, 9.1% took down detailed notes while the programmes were on the air, whereas 40.4% only made a note of the important items.

The Instructional Effectiveness of the Programmes

The students who had taken part systematically in the mathematics course voiced the following opinions on the instructional effect of these programmes: 67.8% believed that the programmes helped them in their studies, 14.6% termed the programmes as "very helpful", while 8.3% regarded them as "superfluous". The following percentage rates were determined for the other subjects, again applying the above categories:

Physics:	66.7%	18.4%	5.0%
Electronics:	65.4%	21.2%	5.8%
Strength of materials:	73.3%	16.7%	6.7%

VII. The Next Stage of Development

The courses continued in the following years were, among others: a) the preparatory course (cf. V. C.) and b) the course titled "Fundamentals of Technology" for people in employment in the first year of study. It was decided not to continue the course for the second year of study. At the same time new courses were included in the curriculum of Politechnika Telewizyjna and supplementary studies were carried out.

In the summer term of the 1968/69 school year, the Inter-University Institute for Research in the Field of University Education conducted a survey among a selected group of 1,901 persons taking part in the first year of the evening and correspondence courses: 311 persons filled in and returned the questionnaires they had received. The questions asked related to the mode of presentation of a certain subject, to the degree to which the television programmes were geared to the evening courses in terms of broadcasting hours, to the degree of difficulty of the programmes and their effect on learning. The survey involved the courses in mathematics, physics, and descriptive geometry. The final report on the study, issued in February 1970, provided a great deal of important information for the television teachers.

Apart from this survey conducted by the Inter-University Institute for Research in the Field of University Education, the Educational Institute for Employed Persons Currently Engaged in Studies carried out a study on the courses in mathematics and physics run in the 1968/69 study year for students in the first year of study. Both of these courses were supervised by two professors each, who then stated their opinions on the courses. These appraisals provided by the supervisory professors offered interesting information for the organizers of Politechnika Telewizyjna and the television teachers.

In addition to the preparatory course and the course for students in the first year who were simultaneously employees, the Ministry of Education intiated two series of lectures in mathematics and physics for secondary school teachers together with the State Broadcasting Committee. These courses are geared to those broadcast by Politechnika Telewizyjna. It became necessary to start such courses due to the new curricula introduced for mathematics and physics at secondary school.

The course in mathematics was commenced in the 1969/70 school year. It is made up of 40 programmes a year and deals mainly with problems of methodology. The programmes broadcast in the 1969/70 school year were based on the first year of secondary school teaching, while those run in the 1970/71 school year were intended for the second year of secondary school. In 1971 the programmes dealt with the third and fourth years of secondary school teaching. The teachers receive accompanying material to go together with the courses and may also obtain additional information from the advisory offices of the Ministry of Education.

In February 1971 a similar further training project consisting of 20 lectures was launched for teachers of physics.

Janusz Tymowsky
Politechnika
Telewizyjna

Sweden **Adult Education by Radio and TV (TRU)**

Voluntary adult education

The adult education movement in Sweden has its origin principally in the popular movements (labour, temperance, religion) towards the end of the 19th century and the beginning of the present. The early work was modest in scope and often improvised. There were two main motives for this activity: to create favourable conditions for the movements so as to enable them to achieve their aim and aspirations, and to raise the educational level of the largest and most neglected sectors of the population. There are now twelve educational associations, Workers Educational Association (Arbetarnas bildningsförbund ABF) is the biggest one.

As previously mentioned, the educational associations are affiliated with various organizations and popular movements. ABF, for instance, is associated with the labour movement, the co-operative movement and some organizations for handicapped persons. The Adult Education Association is likewise affiliated with the Centre Party and the Liberal Party and to their youth's and women's organizations and the Farmers Co-operation. Two of the educational associations are affiliated with the church and with religious movements. One educational association — the Universities Extension Organization — is not affiliated with any popular movement but instead, to some extent, with the universities.

Among the numerous activities pursued by the education organization lectures, libraries and study groups have always been predominant.

The study circles are the most important activity pursued by the educational associations. As previously mentioned study circles were established and developed by the popular movements. There are now 160 000 circles with 1.6 million participants putting in close to 4.3 million study hours annually.

Study circles are based on the principle of small group activity. The average number of persons in a circle is ten. According to the rules for government financial aid, a circle must have a minimum of five members and not more than twenty. By official definition "a study circle is a group of persons who meet to pursue the common study of a predetermined subject or group of related subjects". In other words, it comprises a group of persons who assist each other in their studies. The leader of a circle is to act as co-ordinator and not as a teacher; he is expected to be merely a member of the group. The members have full freedom to discuss and decide on the study aims, determine the direction of the studies, the procedure and pace, indeed everything applying to the work of the circle.

Vocational training

The scope of these activities expanded considerably during the 1957–59 regression and has increased tenfold in the last ten years. During the present fiscal year about 100 000 persons are given vocational training by the Labour Market Board.

The vocational training offered is accommodated to the labour market policy. Hence, the purpose of this form of education, which includes vocational retraining, supplementary courses and other trade education, is partly to enable unemployed persons or those in danger of being unemployed owing to business changes to adjust themselves to new occupations, and also to prepare handicapped and other persons who have difficulty in obtaining steady employment. The policy is also directed at satisfying the needs of business for skilled labour. Courses are given for the purpose of increasing the supply of labour in trades where there is a shortage of skilled manpower. Unemployment is not a requirement for attending these courses.

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In the autumn of 1969 experimental courses were started offering also general subjects in the industry-oriented vocational courses. They include mathematics, physics, chemistry, Swedish, English and civics. The aim is to give students, whose educational backgrounds are usually limited to a six-year elementary school, a supplementary general education.

Vocational training appears to be effective, and random tests have shown that about 80 per cent of the trained obtained employment shortly after concluding a course.

Local education schemes

The local schemes provide for adult education using the same curriculum as the high level of the comprehensive school, continuation school and gymnasium (elective subjects) and vocational school (vocational courses). The instruction is usually offered on a part-time basis. The student can choose between studying separate subjects or all the subjects needed to pass the equivalent level in the regular schools. The tuition takes the form of "concentrated reading", whereby the students concentrate on one, two, or at the most three subjects at a time.

The 1967 school reform has brought about a rapid expansion in local adult education. During the 1967/68 school year evening courses were given in some 30 municipalities, while in autumn 1970 about 300 municipalities offered adult tuition.

In 1970 about 37 000 students took elective subject courses equivalent to the high level of the comprehensive school, and 49 000 took "gymnasium" and continuation school courses.

About 80 000 pupils attended local and otherwise sponsored vocational schools in 1970. State grants are payable towards the full salaries of teachers and school administrators.

The principal subjects, i.e. those read by most students are, in their order of importance, English, mathematics, Swedish, civics, managerial economics, and history. The vocational schools give courses in numerous industrial and other trades, business and social service occupations.

The teaching is free of charge for the participants.

The folk high school

In 1969, the Swedish folk high school celebrated its centenary. Government grants are now payable to the 105 schools and to some ten branches. The schools are operated by three kinds of principals, viz. the county councils, sponsoring associations and popular movements. The sponsoring societies usually obtain substantial financial aid from the county councils, which are then represented on the boards of the schools. The "movement schools" do not constitute a homogeneous group. The particular movement operating the school holds a majority on the board, but it is customary to offer a seat to the county council and one to the local council in the municipality where the school is located.

The aim of the folk high schools is to provide general citizen knowledge or, as expressed in § 1 of the school statutes: "The folk high school serve the purpose of teaching citizen knowledge to their pupils. Their objective should be to impress on the pupils a sense of responsibility as humans and members of society. The education should be framed so as to strengthen their will to co-operate and develop their potentials for independent thinking and critical attitudes, as well as stimulate their interest in study. Within the general terms, each school is free to pursue its own education programme."

In recent years, an increasing number of students have attended the folk high schools in search of further education for use as a basis for more advanced training. Some

schools have started new lines of vocational training and special courses are also offered in music, drama and art, in mass media techniques and in the problems of the developing countries. There are courses for the training of youth and study counsellors and for organizational management. Several schools now offer preparatory courses for admission to the schools of social work and public administration.

There is no centrally imposed curriculum. Each school is free within its charter to decide on its own programme. Only music is obligatory for all annual courses. Otherwise, the statutes stipulate the subjects only for the first-year course. These are Swedish, literature, history, civics, psychology, chemistry, biology, and hygiene. In recent years an attempt has been made to eliminate the concept of annual courses in favour of a syllabus of subjects.

Adult education under government auspices

At two government schools (in Norrköping and Härnösand) adult education is offered according to the syllabus for the upper level of the comprehensive school, continuation school, and gymnasium. The instruction is a combination of correspondence school courses and classroom work.

Swedish Broadcasting Corporation's adult educational programmes

Ever since the Swedish Broadcasting Corporation was founded in 1925, adult education has been offered in various ways within the framework of general broadcasts. The initiative for these courses was taken by the Swedish Broadcasting Corporation itself in most cases, and the production costs were financed from the radio licence fees (nowadays merely referred to as "radio fees"). Government grants are made available only for special courses. "Sveriges Radios Folkbildningskommitté" (people's education committee of the Swedish Broadcasting Corporation), the members of which are suggested by various organizations and appointed by the director general, only serves an advisory purpose.

In 1964 a special department for adult education on radio was founded, and was combined with the school radio department in 1969/70.

The courses must be regarded primarily as a continuation of the old educational traditions existing among the public. Since the 1960's, an increasing number of educational facilities oriented towards the labour market has been offered, as well as lessons leading to officially acknowledged examinations and courses for definite target groups, such as retired people. Broadly speaking, the output of courses may be split up into two principal categories: general courses and language courses. The latter category consists of a Swedish course for adults at upper elementary school level and a number of Swedish courses for foreigners. The general courses broadcast in the past 10 years comprised above all the following fields of knowledge: Matters of society, international problems, general (school) subjects, arts and poetic subjects, and spare time occupations.

Hitherto, the courses offered were usually radio courses, but now television series have been purchased and integrated in various multimedia projects, in addition to TRU's own television programmes which have been produced since the spring of 1970. Books and an increasing amount of other supplementary material are available for the individual courses so that the participants can study by themselves. In certain cases, the participants' learning success can be checked by providing them with examination papers and co-operating with correspondencestudy institutes, to which the participants must send the papers once they have filled them in. Instruction material to be attached to demonstration boards and teacher's manuals have also been prepared in a few cases for application in study groups. The books accompanying the courses are published by the Swedish Broadcasting Corporation Press.

The reasons leading to the adult education reform in 1967

In the government bill on adult education (No. 1967:85) the Minister of Education emphasized that "adult education" has become a collective term combining various types of training and educational activities which naturally also have different objectives. He added that the Swedish government participates in three different sectors of adult education, these being labour market-oriented training, education at grammar school and pre-grammar school levels, and public education for the people.

The Minister of Education stressed that in these sectors there was a particular desire for the government to commit themselves more intensively. However, it was necessary for various reasons that primary importance be attached to such activities that contribute in an active manner to developing the Swedish economy.

The first and foremost of these endeavours made by the government is that of job conversion and further education, which constitute a major part of the directives set down by parliament in the preceding legislature for the future economic policy of the country. In fact, labour market-oriented education and training is a suitable means applicable by the government for fighting the dangers of unemployment, and simultaneously serves the purpose of supporting the efforts made for an economic reform, thereby providing increasing equality of people's incomes (government bill p. 31).

Moreover, the government bill also provides sufficient room for activities which make allowance for the individual wishes of the adult population for an enlarged and greater scope of study facilities and the further education system. In compliance with this bill, such an improvement of study and further education facilities might be effected in terms of a more general educational system or along the lines of the school curricula. The Minister of Education gave three reasons for this decision:

a) The reforms of the school education system have led to significant differences in educational standards between young people and adults. For this reason, the government should make funds available to such persons who were obliged to make do with a lower level of education when they were young, although they would have been able to attend a grammar school or a specialized school of some other kind in view of their abilities.

b) The right of each person to choose in his youth the education and training he desires would be incomplete if there were no possibility for a person to change his "direction" of training at a later point in his life.

c) Some young people prefer to start work and earn money immediately after leaving elementary school (i.e. after the obligatory school period), and do not acquire any supplementary training until a later date. Others think it is better to carry on their training after leaving elementary school, but only in their spare time. The wishes of these groups for education and training must, however, also be taken into consideration.

The Minister of Education also emphasized that the scope of further education for adults would be unduly restricted if the steps taken in this matter were invariably in line with the school or university curricula and did not provide for any additional possibilities. He added that the most significant objective of the country's educational policy was to enable an increasing number of persons to take part actively in cultural life and to allow them to find independent viewpoints of their own regarding matters of society.

Thus, the government bill specifies very clearly that the participation of the state in adult education should — with the exception of labour market-oriented training — relate to educational facilities based not only on school curricula, but also on the principles of general education for adults, as provided for example by study groups and associations.

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The need of the adults' in Sweden for education and training

The principle of equality is of decisive importance within the basic reasons given by the government for committing themselves to promote the adult education system. As has already been pointed out, the reforms in the field of young peoples' education and training have brought about quite a substantial gap between youths and adults, so that it was considered an urgent duty of the government to make allowance for the educational needs of those adults who were obliged to leave school relatively early on in life and thus only had poor school education.

Studies have shown that persons who were given a good start in life, who grew up in favourable surroundings and enjoyed a good education, also learnt to use the possibilities and potentials offered by society. And vice versa, the consequences of unfavourable surroundings in terms of culture and of short and insufficient school education are:

- badly paid work,
- fewer chances of supplementing one's training and education when grown up,
- fewer possibilities of finding a well paid job,
- fewer chances of joining in society actively in a cultural respect.

It goes without saying that an educational policy for adults which, in accordance with the explicit intentions of the government and of parliament, is to be aimed at a target group of persons who have been deprived of certain chances in a cultural and educational respect, cannot be conducted independently of the needs and wishes of these persons.

The TRU-Committee

TRU, which stands for the Committee for Television and Radio in Education, was appointed in February 1967 by the Swedish Ministry of Education in order to study the use of tv/videotape and radio/audiotape in the educational system and to plan and conduct experimental projects.

The technical development and the encouraging results of experiments both in Sweden and abroad gained through the use of new media in education had raised the expectations that these audiovisual aids could make education more effective both as far as the achievements of the students and rationalization of the educational system are concerned.

The members of the Committee are representatives of educational authorities and the associations of voluntary adult education. TRU is not supposed to be permanent as a committee. The committee has to submit the results of its findings and suggestions for the utilization and organization of public resources in the future.

As a government committee TRU is unique, as a production unit is connected to the committee. At its start in 1967 TRU took over a large part of the equipment which a private company had built up for commercial tv production. TRU now has about 140 employees, but still others are engaged for the production as experts and free lance collaborators. The TRU staff consists mostly of tv and radio producers and technicians, whereas experts in special subjects are employed for the various projects.

TRU is granted funds through the national budget. The Swedish Broadcasting Corporation (SR) has a division for educational programmes that is also financed by state funds except for the section for adult education, which is financed by license fees. TRU is completely independent of SR, even though some of TRU's products are broadcast by SR. As producer of these programmes TRU has to obey the laws and regulations that apply to SR's monopoly of public broadcasting.

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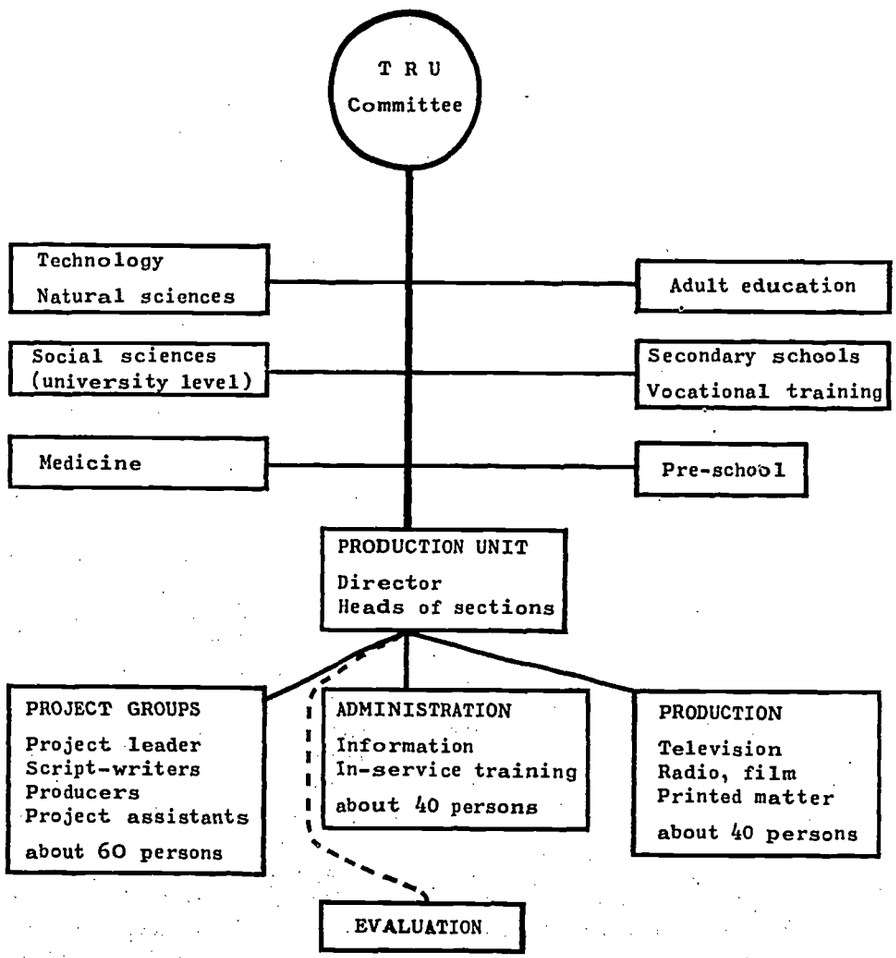
TRU owns the copyrights of the programmes broadcast; therefore, the programmes can be used freely in recorded form. Other parts of the course materials, i.e. the printed material are available through bookstores and the like. The experimental versions of the course materials which are used in controlled learning situations, i.e. at the Technical Faculty of Linköping University, are delivered by TRU free of charge.

The present organization of TRU

In 1967 the function of tv and radio in education was supposed to be recordings of lectures and demonstrations. Along with the development of the principles of educational technology TRU now produces multi-media-systems where tv/videotape, radio/audiotape, cassettes, printed material and planned student activities are integrated parts of an instructional system. Due to the directives of the Committee, TRU is concentrating its activities to six main sectors of the educational system. The following diagram illustrates TRU's different fields of activity and production.



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TRU's technical resources

TRU's production unit is situated in Stocksund, a suburb some miles north of Stockholm. TRU has professional equipment for both tv and radio recordings. The three tv studios cover 375 m², 175 m², and 60 m² respectively; the smallest one is equipped with complete remote control. In addition there are film resources and workshops, set and graphic.

Planning of the production

The broad outline of the work is planned by advisory expert groups (one for each of the six sections). Usually the chairmen of the groups are members of the TRU-Committee. The secretary of the expert group is the head of section. The detailed planning is handled by small planning groups which are made up of employees of TRU and persons outside of the organization.

In the production of instructional systems the preparatory stages, analysis and planning, take the most time and effort. Usually it takes about a year from the decision to go ahead with a projet to the finished product.

A project orginates either as a proposal from an education authority or stems from the expert groups. Because of the experimental nature of TRU's work the projects are often chosen with this in mind.

A brief account of the activities within the six sections of TRU

Pre-School

In 1969 TRU was asked to produce tv programmes for 5—6 year old children. A state commission is dealing with the question of a compulsory kindergarten in Sweden. The commission feels that radio and tv have an important task to fulfil as a complement to the activities in the kindergartens, and, in particular for the children not enrolled in kindergartens. In the fall of 1971 the first pre-school programmes from TRU were broadcast on the national network.

General School System (TRUAS)

(Head of section: Ann-Margret Fris)

TRUAS is the section for the non-compulsory school level, i.e. secondary schools, and also vocational training of adults (labour market training). At the secondary school level the work is directed toward production of complete teaching systems. The courses are tested at some schools and a comprehensive use of all the courses is planned for 1973/74. Swedish, physics, Russian, technology and civics are some of the experimental areas.

For vocational schools instructional systems are being worked out in corporate economics, English and mathematics. A course in anatomy is being produced for the social service occupational training. A series of tv-programmes for the vocational guidance work in the schools are being broadcast.

Social Sciences

(Head of section: Frans-Olof Brunzell)

For the choice of subjects in this section at the university level, consideration is given to courses where there is a shortage of teachers.

The first course in corporate economics, has been used at all the universities. A course in general economics will be used at the universities and will also be distributed on the air in the frame of adult education.

Facts about TRU Adult Education Courses

	Level	Printed material	Price Sw Cro	Corr mater
English I	Gymn	Book package	47	Yes
English II	Gymn	Book package	51	Yes
English III	Gymn	Book package	52	Yes
Brush-up Time (English)	Grade 9	Book	11	No
Business Economy I	Grade 9	Book	25	Yes
Business Economy II	Grade 9	Book	28	Yes
Business Economy III	Grade 9	Book	27	Yes
Psychology	Gymn	2 books	24	Yes
Social knowledge				
1 Social psychology	Gymn	2 books	20	Yes
2 Social politics				
Elementary Mathematics	Grade 7-9	2 books	30	
Theory of sets			15	Yes
Elementary Swedish	Grade 7-9	Booklet package	45	Yes
Labour Market Information	General	Book	23	Yes
Labour Market Information in Finnish	General	Book	5	No
Developing Countries	General	Book	17	No
"Human Relations"		2 books	17	
Applied psychology	General	Booklet	17	No
Family economy				
Sex education				
Farming information	Farmers education	5 booklets Study plan	30	Yes
Workers' relations to trade union	General	—	—	No
TELLUS (natural geography)	General	4 booklets	14	No
General Economics	Univ	5 books + supplementary literature	160	Yes
"Little men" (Relations parents — pre-school children)	General	1 booklet	6	No
Information for people involved in tourism (regional course)	General	1 booklet	5	No
"Women and work" Women's situation on the labour market and as house wives (partly regional)	General	1 booklet	10	No
Information about the new system for the general income tax return	General	1 booklet	free	No
Information for adult students	General	—		—
"Strange Words" Dictionary on tv	General	—		—

Publisher	Programmes		Programmes length		First broadcast
	TV	Radio	TV	Radio	
Hermods	—	30	—	30	
Hermods	—	32	—	30	1968/69
Hermods	—	32	—	30	
SR		20	—	30	1969
Brevskolan	13	13	30	30	1969
Brevskolan	5	12	30	30	1969
Brevskolan	3	12	30	30	1970
TRU	16	16	30	20	1969/70
Utbildningsförlaget	3	13	30	30	1969/70
Brevskolan	18	18	20	20	1969/70
Brevskolan	—	2	—	20	1971
Brevskolan	—	32	—	30	1969/70
Brevskolan	6	16	20	20	1970/71
Brevskolan	2	2	30	30	1970/71
TRU	10	10	30	30	1970/71
	8	—	30	—	1970/71
Brevskolan	12	—	30	—	
LTK	5	—	20	—	1970/71
—	5	—	20	20	1971
Utbildningsförlaget	10	—	30	—	1971
Utbildningsförlaget	27	40	15-40	30	1971/72
TRU	10	—	20	—	1971
TRU	—	10	—	25	1971
TRU	2	10	10	20	1972
RSV	5	—	15-30	—	1972
	16	—	20	—	1970/71
	20	—	15-20	—	1970/71

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Two new university subjects where the professional side is stressed have got material from TRU (so-called DYRK-courses). These courses, in labour market technique and educational technology, will be used at several universities.

Medicine

(Head of section: Frans-Olof Brunzell)

Within medical training, colour tv is considered to be especially important and for this reason TRU has conducted a special study. Comprehension results with colour and black-and-white tv respectively, were compared. Introductory obstetrics as well as defense and emergency medicine are projects which are under preparation within the medical section.

Technology and Natural Sciences

(Head of section: Jan Nilsson)

At the start TRU received a large order for production of instructional systems for a new technical faculty in Linköping. According to a decision of Parliament instruction may here be carried on with the help of pre-produced materials. The faculty started in 1969 and the first TRU courses were introduced in the fall of 1970. The courses include algebra, drafting, differential and integral calculus, mechanics, physics and mathematical statistics.

Adult Education

(Head of section: Ingemar Petri)

Within TRU the section for adult education is the largest as far as the number of staff members is concerned. It is also the TRU activity that is best known to the general public as the courses are broadcast on radio and tv (by SR). In 1968 the first TRU courses were broadcast on radio and tv; they dealt with English and corporate economics at the secondary school level. These courses were specified in the frame of reference given to the TRU-Committee. These courses as well as the following ones in psychology and sociology were connected to a curriculum and povided an opportunity to take exams at the secondary school level. In these courses as in several others a correspondence course was offered in conjunction with a correspondence school as a voluntary part of the course material.

Trends have developed, however, toward the production of broad informational courses for adults with only six or seven years of basic schooling. Examples include an elementary course in mathematics, one on developing countries, one on human relations, one in Swedish, one in natural geography. By the spring of 1971 TRU had produced 12 adult courses. Among the new courses transmitted in the fall of 1971 is the course in general economics mentioned before and programmes for parents in conjunction with the pre-school programmes.

Broadcasting time

Broadcasting time is of great importance to adult education on tv. During the first two years TRU programmes were broadcast on Saturday and Sunday mornings or after 10.00 p.m. Since the fall of 1970 TRU has access to Monday evenings on Channel Two after 8.00 p.m. The courses on Channel Two are re-broadcast on Channel One as the network of Channel Two does not yet cover the entire country.

The course material may be used by the students themselves or in different kinds of groups, organized by study associations, municipal adult education, people's high schools, business education, etc. In 1970/71 the study associations had about 16 000 participants in study circles associated with various TRU courses.

For group studies the programmes are used in the form of tapes (chiefly radio programmes). Local audio-visual centres record the programmes and distribute copies. The libraries also record TRU courses for lending.

Special Departments

Training of the employees is important for TRU. On the job training goes on constantly as well as the training of persons who are not members of TRU's staff but who work with TRU.

Evaluation proceeds in all projects and is carried out in co-operation with the pedagogical institutions at the universities of Uppsala and Umea as well as the Audience and Programme Research Department of SR.

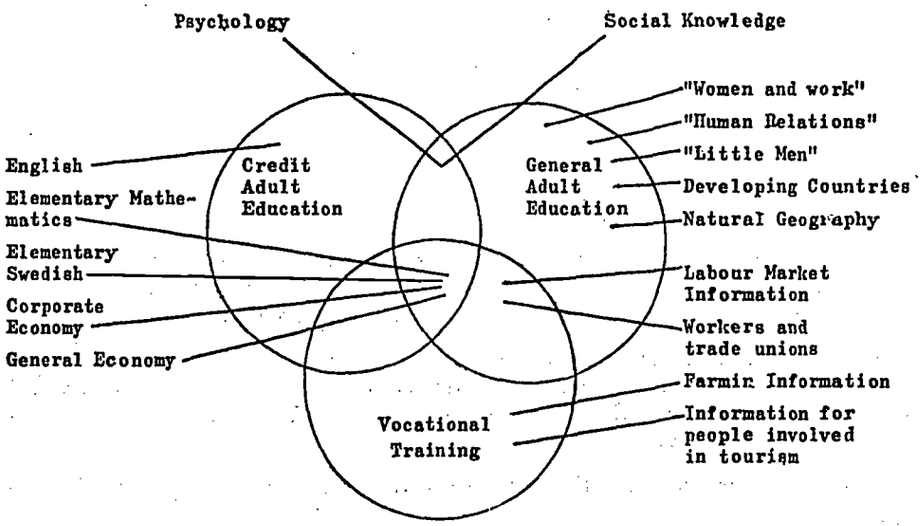
The printed materials is produced in co-operation with various publishing houses.

The TRU courses

The term "adult education" is often split up into the following three categories (although this breakdown is somewhat simplified):

- adult education with an officially acknowledged final examination, etc., or courses in which the participants receive certificates,
- adult education oriented towards general standards or "people's education",
- profession-oriented adult education or specialized training.

Naturally, it is not possible to draw a definite line between these categories. In reality, most of the courses and educational facilities comprise more than one of these aspects. A graphic representation serves to show the exact nature of the individual categories and their overlap more clearly. This representation also includes the courses that have been in TRU's curriculum for a relatively long time and which have been produced by TRU until the autumn term of 1971 inclusive.



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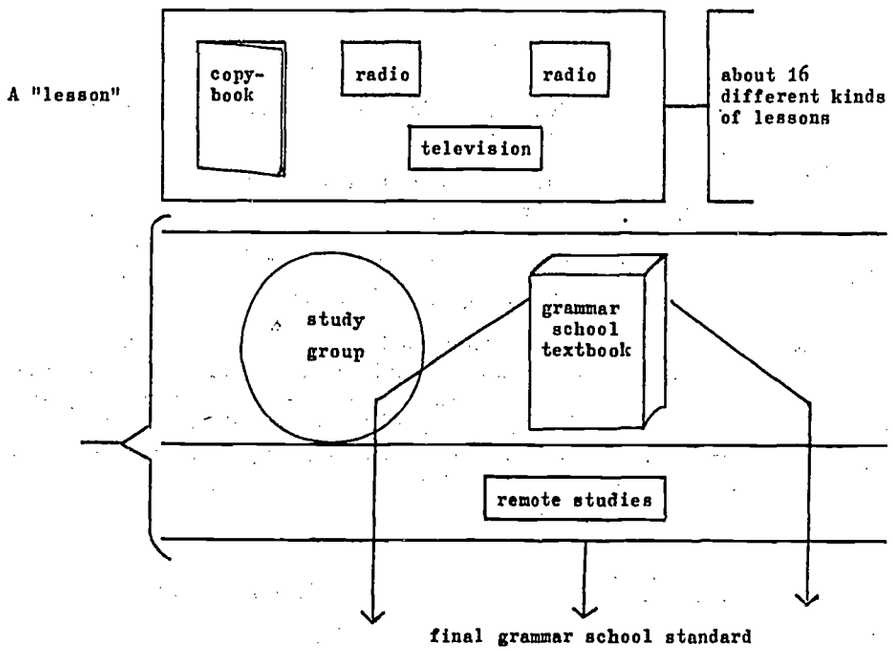
A short description of two of the courses

"Psychology"

This course is made up of 16 television programmes lasting 30 minutes each, and 22 radio programmes lasting 20 minutes each. It also includes two "Psychology" course books Parts I and II. The aim of the course is to offer the basic information provided in the Swedish grammar school courses on psychology, while employing supplementary material in the form of prescribed literature for the participants, to present the entire subject matter included in said grammar school courses. This course was broadcast for the first time in the 1969/70 term and re-broadcast in 1970/71.



"We call them developing countries"

The aim of this course is to inform participants of the problems prevailing in so-called developing countries. The main target group is constituted by persons who do not have any great knowledge of these countries or the conditions to be found there.

The course is made up of 10 television and 10 radio programmes, a course book and an exhibition which was organized by "Riksutställningar", the state association for exhibitions. The course book titled "We call them developing countries" is distributed by the "Brevskolan" institute of remote studies.

The series was broadcast for the first time in the autumn of 1970 and broadcast in spring 1972.

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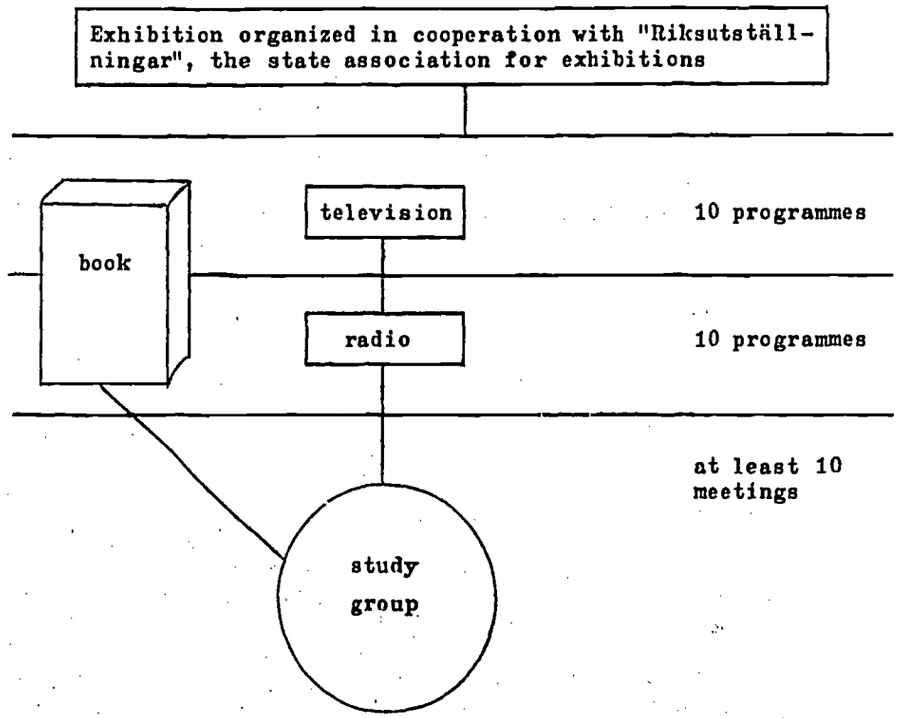

A Committee report in May, 1971

The first report of the TRU Committee was presented in May, 1971. The report was mainly devoted to organizational questions. In a brief survey of the experimental projects and the results obtained at the time the committee stated that it seems impossible to make a reliable overall comparison of costs and effects between conventional teaching and the use of instructional systems. One reason is that the latter demands a change of many of the prerequisites. The projects have yet given much useful experience and the majority of the results are favourable as such. It is also obvious that the experimental work of TRU has stimulated activity in related fields and that the impact of TRU's efforts thus can be extended to the advancement of the educational system as a whole. A later report will give a more detailed account of the pedagogical findings of the experimental projects.

As for the organization; the report suggests that TRU and the government financed part of SR's division for educational programmes should be combined into one government-owned production company outside of SR. The company should be made a completely government-owned non-profit corporation. The main function of the new unit will be to produce multi media systems, some of which for public broadcasts and some primarily for use by CCTV and tape recorders. The production connected with broadcasting will be financed through the national budget. In these projects the authorities and study associations cannot have the final responsibility for the planning and the products. The board of the unit will gather all proposals for educational broadcasting from all parts concerned and make a suggestion for the prioriting to the government. Due to the broadcasting law, the authorities may not censor the programme broadcast, the responsibility for the construction of these products will be that of the unit.

A rational use of the unit's resources of technical and media experts demands that the unit can be used not only for the educational broadcasting but also for the production of multi media systems intended for CCTV as well as for tape recorders. The unit will therefore meet the needs of such teaching materials from educational authorities, other official organizations etc. In these cases the unit will accept orders and the subscriber will have to pay the production costs. Since the funds to the authorities and organizations for financing the production of teaching materials are limited the investments will be concentrated to areas and subjects where there is a shortage of competent teachers or materials available and where the private companies have no interests or where there is need for research and development projects.

Parliament is expected to take its stand on the report in the spring of 1972.

The continuation and evaluation of the TRU adult education courses

In the course of time, the evaluation work done by TRU in the field of adult education has developed along definite lines. True, a certain amount of work is done for analysing purely instructional matters, but most of the endeavours made deal with other items such as organizational questions arising when new participants enrol and the possibilities of taking part in further courses leading to a higher level than the present ones. The possibilities of carrying out experiments in order to find the correct approach for a course are very closely restricted in adult education, since the courses are aimed at such a large number of persons who want to acquire additional knowledge and the methods applied for studying are so very different. It is accordingly not possible to gain control over external influences in the case of these adult education courses, as can be done for instance in regular school and college education.

For the purpose of this evaluation work, TRU co-operates very closely with the programme and opinion research department of the Swedish Broadcasting Corporation, and this department has made material available for various studies and examinations carried aut by TRU. In the course of 1970 the scope of these studies was extended to the teachers' training colleges at the universities in Sweden, where the studies were carried out independently by the students.

In the first year, most of the evaluation work related to the overall student body and programme output, and the so-called representative studies in which a selected group of participants was examined in terms of their educational background, their viewpoints on the courses, the teachers' experience, etc. Unfortunately, however, the results of these studies cannot be regarded as absolutely representative and must be interpreted very carefully owing to the difficulties encountered (such as the problem of reaching the individual participants and the insufficient number of answers received when asking the participants questions). Since 1969, the evaluation work has been effected along new lines. Primary importance is now attached to special studies of a specific nature. It has been attempted above all to examine the effect it had when the participants of the TRU course "Let's do some more mathematics" were visited at home after this course had been concluded.

The number of participants in the TRU adult education courses

The great interest shown in TRU's first adult education courses had not been anticipated in full and was in fact a bit of a surprise, even for the responsible persons who planned and conducted these educational activities on a central basis. The predictions made regarding the number of course books to be printed and the number of participants who would sit for the various examinations and diagnostic tests were incorrect in several cases. For example, the TRU course in business management had not been

expected to become so popular and attract as many participants as it eventually did. In contrast to this, the relatively low number of people who took part in the first broadcasting of "Let's do some more mathematics" was also rather surprising.

It is practically impossible to state the exact number of persons who take part in the TRU courses, as a great many of these participants carry on their studies quite independently and as there is no enrolment procedure for the participants. Merely by way of experiment, it was attempted in the first few years to distribute a participant's card together with the course books, so as to gain an idea of the student body. However, the answer rate was so low (approx. 25% estimated) that this experiment had to be stopped. It is nevertheless possible to estimate the number of participants roughly by considering the number of course books sold and the information provided on the number of television viewers. This information and the estimates based thereon are made available by the PUB organization, which carries out daily research on viewing rates in Sweden. As the percentage share of educational programmes in the overall television output is relatively low, the degree of statistical uncertainty is however still quite high. This applies particularly to the data regarding the 1969 autumn programmes.

The big difference between the number of people who watched the individual programmes in autumn 1969 and in the 1970/71 term is due to the fact that in 1970/71 each programme was re-broadcast at least once at a relatively favourable time of the day (at approx. 6.30 p.m. or 10.05 p.m. on Channels One or Two). Naturally, the question of broadcasting times is of great significance.

The chart on page 182 shows the number of books sold and offers information on the number of viewers. In cases where the same programme was broadcast several times in one term, the number of people who watched the individual broadcasts was added up before the mean values were calculated for each series.

Only a small number of the participants made use of the possibility of attending a follow-up course after the programmes had been broadcast. The following figures are to indicate how many participants attended the various types of follow-up courses.

When the grammar school courses English and business management were broadcast for the first time in 1968/69, 1 800 English participants and 6 400 business management participants took part in the group activities organized under the auspicies of the study associations. In 1970/71, a total of approximately 210 000 persons took part in such group work — in some 2 200 study groups — following one or other of the TRU courses. In 1969/70 approximately 3 100 persons took some kind of special examination to obtain the Swedish grammar school leaving certificate (roughly the equivalent of the GCE "A-Levels" in the UK), after having attended various TRU courses.

In autumn 1970, 3 800 persons from adult education schemes run by the communities and 3 100 persons attending courses at the so-called "peoples' night schools" participated in TRU courses or parts thereof.

The drop-out rate

Like in any other educational system or scheme, some of the participants will always stop studying before the courses have been finished. It is difficult to determine, as has already been mentioned, how many people really finish a radio or television course

The sales of books and the numbers of viewers

Name of the course Name of the book	Total number of books sold on Dec. 31, 1970	Mean number of viewers per programme		
		in autumn 1969	in autumn 1970	in spring 1971
English, grammar school level				
Work material, first year's course	29 300			
Work material, second year's course	14 400			
Work material, third year's course	8 600			
Brush-up time (English)	17 500			
Modern Swedish				
Book 1: Language structure	19 600			
Book 2: Everyday letters	20 200			
Book 3: Listen and speak	19 300			
Book 4: Describing and reporting	16 500			
Book 5: Convincing and investigating	16 300			
Book 6: Meet a writer	16 200			
Business management				
Modern business management	56 200			
Company sales planning	24 900			
Company bookkeeping	20 900			
Company organization	14 400		225 000	
Psychology		150 000	235 000	136 000
Part 1	13 600			
Part 2	5 400			
The community of man		160 000	185 000	136 000
Part 1: Socio-psychology	20 900			
Part 2: Social politics	11 300			
Let's do some more mathematics		150 000	225 000	361 000
Part 1	23 400			
Part 2	8 000			
We call them developing countries	7 600		620 000	
It's for you Parts 1, 2, and 3	6 800		280 000	198 000
The labour market	3 200		70 000	136 000
The labour market (in Finnish)	2 500		170 000	
Know your world	5 400		70 000	48 000
Information for adult students			265 000	136 000
Do you know? — a television dictionary —			105 000	89 000

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by taking part right to the end. Nevertheless, information on the drop-out rate is available for the period between the two terms of "English at grammar school level" and the period between the two terms of "business management at grammar school level", i.e. drop-out between the first and the second term of these two courses, which both started towards the end of 1968. It should however not be overlooked in the case of these two courses that the seemingly high drop-out rate observed here is *not* the effect of participants' discontinuing their studies as such or admitting they have failed. Rather, a great many of the participants presumably intended from the very beginning only to watch part of the course. This applies above all to the grammar school course in business management, the first part of which titled "Modern business management" is a general introduction to the subject and is quite suitable for being studied on its own, i.e. without the rest of the course.

As anticipated, the participants attending the study groups and meetings supervised by a teacher tend to be far more persevering. This effect is probably not only due to the study method in itself, but also the fact that these participants are more determined and willing to reach a definite aim than the people who do not attend such an organized adult education group or meeting. However, the statement regarding the latter category of students, i.e. those who work on their own, must again be interpreted with care, as it is based on those participants who voluntarily enrolled on a form sheet (see below) and who are not necessarily representative for the entire category. It is to be assumed than in all the drop-out-rate is higher than shown here.

The reason for drop-out given most frequently by participants who did not finish the first year's course is that they did not have enough time to learn the prescribed subject matter between the individual programmes or that their studies impaired other plans or intentions they had.

Nevertheless, quite a large number of drop-outs state that they are willing to continue their studies when the next course starts.

The sociological composition of the student body

The participants who work on their own and are thus not known to the organization make it difficult to describe the student body in the TRU adult education courses. Although it has been attempted to reach this isolated group of participants by using so-called participant's cards distributed together with the course books, this attempt was unfortunately not successful. The number of participants who returned the filled-in cards of their own accord constituted not more than about one-quarter of the overall student body, and this percentage is too low to allow any conclusions to be drawn. Naturally, it was easier to supplement the research material in the case of those participants who attended the lessons supervised by teachers, for instance by asking the teachers questions about the participants in their groups, etc. Subject to these limitations it is perhaps of interest — particularly as more exact data are not available — to provide information referring to the educational background and age of those participants who took part in the business management course at grammar school level in 1968/69.

Only 25 per cent of the participants in the business management course are female. In all, the breakdown of age groups among the student body is the same as that in adult education courses run by other organizations, i.e. the younger groups are represented to a greater extent. In the business management course, however, the older age group is represented somewhat more frequently than might be expected, as 16 per cent of the participants are 50 years of age and over.

The following chart gives a very detailed description of the participants' general educational background. The study associations usually include groups of participants

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with 6 or 7 years of elementary school, whereas remote study institutes and adult education schemes organized by the communities have a higher percentage of participants with a secondary school or grammar school background.

The general educational background of the participants in the business management course

	Adult educ.run by communities	Study associations	Remote study inst.
Elementary school	15%	50%	31%
"People's night school" (for adults)	15%	1%	5%
Vocational training school	5%	7%	9%
Secondary school	20%	11%	23%
Grammar school	9%	8%	10%
Teachers training college (and similar schools)	17%	0%	0%
University/college	1%	4%	1%
other background*)	34%	19%	21%
no comment	5%	—	—

*) e.g. commercial, technical and engineering training

The participants' motivations

The reasons given by the participants in the TRU courses for having decided to continue their education will certainly be of interest to the planners and organizers of other adult education courses. When asked why they had taken part in the grammar school course on business management, the participants stated the following:

Motivations for taking part in the business management course at grammar school level

	Adult educ. run by communities	Study associations
Want to take GCE "A-Levels" (Swedish equivalent)	27%	15%
Use knowledge in my job	47%	40%
So I can understand specialized literature	12%	15%
As a hobby	8%	14%
Other reasons	5%	15%

The chart shows that the reasons for participants are very different, although the course is based entirely on subject matter taught at grammar schools and is relatively homogeneous in composition. The reason given most frequently is that the participants want to use the knowledge they acquire in the course for promoting their professional situation. Nevertheless, not even 50 per cent of the participants stated this reason.

The introductory diagnostic examinations

Before the first TRU courses were started, so-called diagnostic examinations were held to check the participants' suitability for the subject matter. On the one hand, the examinations were to help the participants to choose a subject, while they also served to give the organizers of the courses information (both locally and centrally) regarding the planning work for the courses and the possibility of adapting the subject matter to the participant's knowledge.

The diagnostic examinations for the autumn 1968 course in business management were welcomed with surprising interest. In fact, TRU received 18 000 answers in this respect from participants so that is was impossible to keep TRU's promise to write to all the participants in reply. Instead of such a written reply, it was decided to broadcast the answers in a special programme. Personal letters were only sent to those persons whose level of education was lower than the minimum standard regarded as being necessary for studying business management at a grammar school level. However, not very many participants were affected by this measure, all the more so since the examinations in business management eventually turned out to be too easy. Out of 12 questions, 87% of the business management participants answered 10—12 correctly.

In order to analyse the reasons for this unexpected interest in the diagnostic examinations more closely, a random group of participants were sent a questionnaire to fill in following the diagnostic examination programme. It then was found that almost all of the participants who had returned this questionnaire (95%) had switched on their television set intentionally to watch the diagnostic examination programme. This proves that the information given about the programmes had been successful. (The programmes were broadcast on a number of weekends at 6 p.m. and re-broadcast late in the evening.) Some 45 per cent of the persons who watched and took part in the diagnostic examination programmes continued to participate regularly in the course. In addition, a further 40 per cent watched the programmes now and then. Thus, more than three-quarters of the participants who had sent in the solutions to TRU then watched the programmes to see what would be shown in the course and to check their own knowledge of this subject. It may certainly be claimed that TRU did indeed succeed in reaching a large number of potential participants thanks to these diagnostic examination programmes and in making them interested in the course.

In the opinion of TRU, the type of diagnostic examination applied for the business management course has one fault: It does not indicate in how far the course is tailored to the target group's level of education, i.e. the educational background of those persons at whom the course is aimed primarily. This question obviously becomes more acute as soon as courses are involved which do not adhere to existing curricula. And indeed, it may well be of interest also in the case of courses leading to a final certificate so as to find that area of knowledge which is necessary to fill the "gaps" in the knowledge of those participants who do not have a sufficient educational background. As already mentioned, this question is of utmost importance for adult education courses not based on the specific curriculum, as the objective of such courses is to meet a certain need among the target group for further knowledge.

The teachers' opinion on the courses

It goes without saying that the teachers who supervised lessons, etc. based on the courses after the courses had been broadcast have numerous viewpoints and opinions that may well be of great value for the future work to be done by TRU.

Broadly speaking, it may be said here that some teachers regarded the programmes as not too difficult and not too easy, whereas others thought they were too easy. Some of the teachers were satisfied with the number of information programmes, while others believed there should have been more such programmes. The course books were on the whole up to the standards the teachers had expected, but one item criticized quite severely was the bad way in which the course book and the business management programmes had been geared to one another. In quite a number of cases the course books were supplemented in the lessons by other texts and material. It also became clear that the teachers' opinions on the presentation of the courses dif-

fered, depending to a large extent on the individual teacher's training and background. Nevertheless, very many of the teachers apparently agree on the necessity of organizing examinations supervised by some central office. Most of the teachers who had the opportunity of comparing the TRU courses with similar courses stated that the TRU courses caused more work for them. This does however not apply to most of the study afternoons held in business management.

The participants' opinions on the courses

Before going into detail as regards the participants' opinions on the TRU courses, as were voiced in special questioning and interviewing schemes, we would first like to state some facts to illustrate how the business management course was organized.

The first part of the course was made up of radio and television programmes as well as the course book. Although each of these media was — strictly speaking — quite independent, the participants were advised to watch the television programmes and listen to the radio programmes. In this way the study work was to be facilitated, especially in the case of persons with insufficient prior knowledge. However, it was then found that just about one-third of the participants really took this advice, while about 60 per cent only watched the television programmes. Only one out of ten participants listened to the programmes on the radio only and did not watch the television broadcasts, which proves that television is definitely more appealing than radio not only in a general sense of the word but also in the case of educational programmes. As has already been mentioned in the introduction to this paper, the question of broadcasting times for adult education programmes on television and radio was an important problem. This situation has however changed as from the end of 1970, as since that time Channel Two has placed one evening a week (8.00–10.00 p.m.) at the disposal of the TRU educational programmes. Nevertheless, the broadcasting hours during which the TRU programmes were on the air in the autumn of 1968 were far from being ideal. The first year's course in business management was broadcast on the radio on a few weekdays from 6.00 to 7.00 p.m., on Sunday mornings and Saturday and Sunday afternoons. In addition, there were re-broadcasts aired during the day, intended mainly for tape recordings in the AV centres, etc. It then turned out that the most popular broadcasting time was that in the evenings on weekdays (which actually was not surprising). The Sunday afternoon programmes had the lowest listening rate. Concerning the television programmes on business management broadcast on Saturdays and Sunday mornings, the Sunday morning broadcasts were far more popular than the Saturday ones.

The participants are of the opinion that the most favourable broadcasting hours are on weekdays from 6.00 p.m. to 10.00 p.m. (preferably the first few evenings of the week), and on Saturday and Sunday mornings. We are glad to say that these requests made by the participants have now been fulfilled on the whole.

It is of course difficult to summarize the participants' opinions on the first adult education courses run by TRU simply by applying relatively comprehensive questionnaires, etc. Nevertheless, it may be claimed in the case of the business management course that the students at remote study institutes showed a far more positive attitude than the other groups of students did — both regarding the programmes and the literature used. Generally speaking, the opinions on the radio programmes are the least positive while the television programmes are more popular. The most popular medium is however the course books with the repetition work included therein.

It can hardly be said that the participants' judgment of the overall course was absolutely positive. One of the main objections was that the programmes were too short

and the rate of progression too fast. Moreover, it was said that the programmes and the course books were too difficult. These views were expressed by quite a large number of the persons questioned.

The level and composition of the student body

When preparing the TRU course "Let's do some more mathematics", the responsible experts paid great attention to the problem of finding the correct starting point (i.e. level) for the course. To this end, tests were carried out, specialists were asked for their opinions etc., but there was still a lot of uncertainty and the various opinions deviated considerably right up to the day when the first programme was to be broadcast. To introduce the series, a special programme was broadcast first to show interested persons the level of prior knowledge required for taking part and the rough contents of the course. It was attempted in this programme to make it easier for people to decide whether or not the course was suitable for them.

In the case of "Let's do some more mathematics" the participants needed very little prior knowledge, so that it was possible to concentrate the special introductory programme on arousing people's interest. However, it was also attempted to stop people with a high degree of prior knowledge from taking part. The procedure described was supplemented by an interviewing scheme involving selected target group members, who in this case were persons having attended elementary school for 6 or 7 years. These test persons were asked on the telephone how much they knew about mathematics. The result of these interviews showed that the course had started at about the right level.

It might perhaps be claimed that, on the average, the answers received indicated that the target group's level of prior knowledge was a bit lower than the standard required for the course. On the other hand, however, the telephone interviews probably made the persons questioned rather nervous, which led to an apparent decrease in the interviewees' level of knowledge. This shows that the people who feared that the standard of the course would be too low were not right. The experience then gained in autumn when the programmes were broadcast also shows that this course was a success in many respects, for instance thanks to its instructional concept, its relatively slow rate of progression, and the interesting combination of subject matter. (See also the so-called Lidköping project in the following.)

The various methods applied for recruiting participants

Most of the advertising and promotion measures conducted prior to the first TRU courses were naturally based on largely conventional methods, above all advertisements in various programmes and in the press. As far as the style of advertising for participants is concerned, there was a certain difference between the study associations and the adult education schemes run by communities. The study associations tend to contact interested persons directly much more often than the community education offices, so as to induce such persons to take part. The community education offices concentrate their recruiting work on advertisements in daily newspapers.

A comprehensive study was carried out in connection with the course broadcast as from autumn 1969, in order to examine the effect of the advertising information propagated particularly after "Let's do some more mathematics" had been broadcast. A random sample of some 1 000 persons was asked whether they had heard about a number of courses to be broadcast by radio and television in the near future. The individual TRU courses reached a positive answer rate ranging from 5 to 20 per cent. Persons who said they had heard about the course "Let's do some more mathematics" were asked to explain more precisely from where they had received this information.

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The answers given to these questions showed that the short information programmes broadcast by television had the greatest impact, followed by the daily information on the courses published in the press.

The Lidköping project — an attempt at promoting the courses by personal contacts

The TRU course "Let's do some more mathematics" is, as mentioned, intended mainly for persons who have attended elementary school for 6 to 7 years. In fact, special importance is attached to this group of recipients, as these people are difficult to reach by means of conventional adult education courses. The aim of the course is to convey knowledge in mathematics in an interesting and simple manner, this knowledge then being directly applicable by the learner both in professional and day-to-day life. It was therefore assumed that participants who could be induced to start the course should be easy to convince of the advantages offered by continuing the course at a higher level. Thus, there were numerous indications that this course was suitable for conducting an experiment on the possibility of advertising for the promotion of personal education. Representatives of the Factory Workers' Association and the Workers' Educational Association (ABF) were interested in co-operating in this project at the Rörstrand factory in Lidköping. The experiment was started following the commencement of the autumn 1969 course.

When the experiment was carried out, there were 662 employees belonging to the trade union working at the Rörstrand factory in Lidköping. The representation of the various age groups was relatively consistent, about half of the employees being 40 years of age and over. The Factory Workers' Association had a well-organized system of contacting the workers at work, which came in usefully when carrying out information and interviewing campaigns. It should also be noted that the standard of wages in the branch of industry concerned is low and that there are not many chances of promotion or job improvement.

Before the experiment was started the situation was something like this: Somewhat more than half the workers had received information material (e.g. brochures) about the course from study associations or adult education facilities run by communities, and most of these workers said that they had looked at the brochures. However, only 12 per cent were thinking about the possibility of taking part in a course.

In order to describe the situation *prior to* the promotion campaign, interviews were conducted to find out the workers' motivations, study interests, need for education, and opinions on mathematics. These interviews were carried out with a random sample of workers employed at the Rörstrand factory and also with workers employed at another company in the town of Höganäs, for the purpose of verification.

The personal visits paid to the Rörstrand workers were preceded partly by thorough information on the project provided by the local press, and partly by detailed information given to 18 liaison persons in the trade union about the course and the aim of the experiment. In the 38th week, three members of the board of directors of the Factory Workers' Association got in touch personally with each of Rörstrand's 662 employees, informed them about the course and tried to persuade them to participate in the ABF study groups.

It may be said that the favourable outcome of this experiment was mainly due to the organizers' activity and co-operation. Possible expenses incurred by the participants for studying do not seem to have played a very important part. The organizers stated that it is easier to recruit learners if the persons approached have friends or acquaintances who are already members of the study groups.

Out of the persons visited, 15 per cent enrolled for the course, i.e. a total of 99 persons. It is interesting to note that only one of these persons did not belong to the so-called target group, i.e. the category with an educational background of 6 to 7 years of elementary school. Four participants did not turn up when the courses were started, and four more dropped out during the winter term. Thus, a total of 91 participants actually took part in the course. 55 of the 99 persons who had initially enrolled were female. The breakdown of the student body was also equal in terms of age group representation, although the 40—50 age group was slightly over-represented, which constituted an unusally high average age for people taking part in such an educational course.

Towards the end of the autumn term, it was possible to determine the reasons that had induced the participants to enrol in the course "Let's do some more mathematics" by means of telephone interviews. The interviewees gave the following answers:

	Men	Women
Asked to do so by study association	34	45
Heard about course before	9	4
Am an organizer myself or a member of the trade union board	3	
Asked to do so by colleagues	8	8
Other answers:		
Read notice at work	2	1
Read about it in newspaper		1
Always take part in some course	2	

When asked what considerations or other factors had induced them to take part in the course, the participants said:

	Men	Women
The description of how the knowledge can be applied	11	7
Nobody is too old	4	10
The level is low enough	3	9
None of the others is better	1	6
It's free	6	12
The study material is free	2	4
Makes it possible to discuss things with my children	5	5

Of the 95 persons who started the course, 46 had never been a member of a study group.

The work and activities of the study groups were recorded in writing each week for the entire autumn. Both the leaders of the groups and the participants had the possibility of expressing their views on the lessons and the material used in the course. On the whole, the attitude shown regarding the course was positive, which is reflected by the low drop-out rate. The negative comments made referred primarily to the broadcasting hours, which many participants regarded as inconvenient. The opinions on the contents of the course and the presentation, which became known thanks to the written recording of everything said, were taken into consideration by TRU as far as possible, so that the study programme was changed step by step during the course.

In addition to this recording procedure, an opinion poll was conducted towards the end of the term to find out whether the people at the Rörstrand factory and the people at the "verifying" company had changed their opinions and viewpoints. However, the

answer rate received was so low that it is not possible to draw any conclusions, although attitudes have possibly changed in a favourable manner at both companies.

When the course was finished the examination the participants had sat for prior to the course was repeated once again, and we are happy to say that the results achieved in this second examination were considerably better than those achieved in the first one, thus testifying a far higher level of knowledge on the part of the participants after the course. This applies especially to the female participants.

Naturally, it is difficult to draw reliable conclusions regarding the effects and costs of personal promotion from an experiment as limited in scope as the one described. In the case of the Rörstrand factory there were several reasons which made the situation exceptionally good. Rörstrand is a small company and Lidköping is a small town. The factory itself only has one building, so that it was easy for the workers to keep in touch. Many of the persons recruited for the study groups knew each other before the course started and were consequently easier to convince of the merits of the course from the very beginning. They also tried hard to keep up with the course and not to give up prematurely. This is shown very clearly by the interviews conducted with the participants. Thus, it may be said in summary that the fact that the experiment was carried out on a limited basis had a number of positive side-effects, particularly as the participants realized how important it was for them to co-operate actively and effectively. It would be an interesting enterprise to expand the scope of the experiment and to study the effects of an active advertising and promotion campaign carried out on a broader basis.

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Japan **The Development of the University of the Air**

A. A Short History of the Plan for a University of the Air

I. Report by the Sub-Committee for Educational Broadcasting of the Social Education Council at the Ministry of Education.

In November 1967, the Ministry of Education advised the Social Education Council to examine the possibility of establishing a new broadcasting station for educational television and radio programmes. This station was to operate independently of the existing organizations and facilities and to hold a licence for broadcasting FM and VHF programmes. The final report presented by the Council in March 1969 suggested that local broadcasting stations should be set up by the universities and other educational institutions, and that NHK and the commercial radio and television stations should not participate in this venture. It may be claimed that this report really paved the way for the University of the Air. The report also included several minority votes of NHK and other members of the Council, who had different views on the matter. In fact, it was the opinion put forward by NHK which initiated the report published by NHK in 1969 titled "College Education through Television".

II. First statement made by the Preparatory Study Committee for the University of the Air in September 1969.

In Mai 1969, the Ministry of Education and the Ministry of Post and Telecommunications organized the Preparatory Study Committee for the University of the Air. In September 1969 the Committee reported the following conclusions:

1. The University of the Air will start operating in April 1971 as one of the new universities to be established.
2. The University of the Air will broadcast its programmes on a VHF and an AM channel.
3. It should be considered which organization will be responsible for broadcasting the programmes: NHK or a public organization.

III. Statements made by two committees of the Liberal Democratic Party (L.P.D.) in September 1969.

The Liberal Democratic Party set up two committees for studying the questions involved in the project: the Sub-Committee for the University of the Air and the Sub-Committee for Educational Broadcasting by Radio and Television. In November 1969, the former reported the following:

1. The law on Remote studies by Radio and Television should be enacted.
2. The University of the Air should have a nation-wide network for the purpose of remote education.
3. The University of the Air will broadcast its programmes on a VHF and an AM channel.
4. The University of the Air will not have conventional faculties and chairs, but will rather organize its instructional work on a flexible basis and allow the teams in charge of the courses and other study facilities to be changed.
5. The University of the Air will provisionally use the facilities and studios of NHK.

In the same month (November 1969) the Sub-Committee for Educational Broadcasting reported the following:

1. The University of the Air is to be regarded as a formal university, with all associated rights based on the Law of School Education.
2. It will be established as a public institution. Nevertheless, it should be discussed whether it will be a state university or special public organization.
3. The University of the Air will broadcast its programmes nation-wide on a VHF and an AM channel.
4. For the time being the University of the Air will use the facilities of the existing broadcasting stations as far as possible.

IV. Reports by two Committees organized by the government

In October and November 1969 the government requested two committees to study the basic problems in respect of the establishment of a University of the Air: The Round Table Conference for the planned university and the Preparatory Study Committee, created in May of the same year for the University of the Air.

After having convened three times, the Round Table Conference arrived at the following conclusions in November:

1. The University of the Air should be planned with new concepts and ideas in mind, without considering traditional institutions.
2. The University of the Air should have one VHF and one AM channel for nation-wide broadcasting.
3. The University of the Air should be an independent university for remote education and should utilize the potentials of radio and television to the greatest extent possible. At the same time, it should prepare the development of the "life-long learning" concept.
4. The application of educational methods should be studied in detail in order to reach a well-balanced relationship between teaching, experimental work and practical exercises.
5. The possibility of graduating with a bachelor's degree and the mutual acknowledgement of study credity by other universities should also be deliberated.
6. The University of the Air should be established as a public institution. In this case it should take the form of an institutional administrative system different from the existing universities.
7. As far as possible, the University of the Air should ask for the assistance of the existing broadcasting organizations and for the permission to use their facilities.

In July 1970 the Preparatory Study Committee for the University of the Air published, after a working period of nine months, its report on the "University of the Air in Japan", which is presented in this compendium following this introduction. This report is entirely independent of NHK's report published in November 1969 and titled "College Education through Television", in which NHK states that thanks to its many years of experience it is quite capable of carrying out the plans for remote education by radio and television, including courses on general scientific training at a basic level, natural science and engineering, and vocational training.

The report made by the Preparatory Study Committee on the other hand, stressed that the University of the Air should be established as a special public college organization and should have its own facilities for producing and broadcasting its programmes.

In summary, it may thus be stated that a great number of reports has been submitted to the public. Of these, the report made by the Preparatory Study Committee has the greatest influence on the current plans.

B. The Present State of Planning for the University

I. Report by the Sub-Committee for Educational Broadcasting of the Social Education Council (now Curricula Committee).

Following the report made by the Preparatory Study Committee for the University of the Air, the Ministry of Education advised the Curricula Committee in October 1970 to discuss the methods for producing the programmes and to study the printed teaching material with view to the aims of the planned university.

The Committe presented the following recommendations at the beginning of 1971:

1. Regarding the production of the programmes, and especially the lecture programmes broadcast by radio and television, everybody working on the University of the Air project should give each other advice and support. We are faced with the task of having to stimulate people's willingness to learn (motivation) and to guarantee maximum effectiveness of the instructional programmes by means of an interesting and didactically suitable style of presentation.
2. The instructional work done by the University of the Air should adequately combine various methods, such as TV, radio, printed material etc., depending on the subjects and contents involved.
3. The media should not only offer study aids, but also assume the function of direct teaching. Therefore we should develop new types of programmes with the help of the new media in addition to the traditional programmes. Moreover, the University of the Air should have a special department for distributing and lending instructional material.
4. Three kinds of printed material will be used at the University of the Air: The Study Guide, Assignment Book and Reference Book. (The Study Guide will contain the aims, contents, and summaries of the programmes, as well as figures, charts, etc.).
5. The printed instructional material may be contained in one single text book. In some cases special texts may be prepared, e.g. instructions for experiments.

The reflections based on the report of the Curricula Committee and that of the Preparatory Study Committee made in 1970, had by April 1971 reached the stage where it was possible to start preparing pilot programmes.

II. Field surveys on the University of the Air

The Division for Audio-Visual Education of the Ministry of Education has published two surveys on the University of the Air. The first survey, carried out in July 1970, examined the degree to which the project had become known among the public and looked into the needs and attitudes of the population over 20 years vis-à-vis the planned university. The second survey was conducted three months later and dealt with the same aspects, this time involving 16 to 19-year-olds. The results of these two field surveys show similar tendencies of attitudes and opinions among the various age groups. One out of four persons questioned intended to follow the lecture programmes of the University of the Air. It is quite surprising that more than one million people, who had not enrolled at any of the other universities, and over 200 000 high school (University/Hochschule) students, presumably wish to study at the University of the Air as regular students.

III. Plans for a pilot programme

Following the report by the Preparatory Study Committee and the report of the Curricula Committee, the University Division of the Ministry of Education requested the

Nippon Shortwave Broadcasting Company (NSB) in April 1971 to plan and broadcast a pilot programme comprising four courses: engineering, economics, literature, and business management.

These courses are planned to be broadcast on short wave radio, commencing in autumn 1971. It has not yet been decided when the television pilot programmes will be broadcast for the first time, although it is expected that these courses will be started in the near future.

Since April 1971 the Curricula Committee has been involved in the preparations for broadcasting pilot programmes by radio. However, quite apart from the television pilot programmes, there are still many other problems to be solved, such as the legal status of the University of the Air, its relationship to the Nippon Shortwave Broadcasting Company (NSB) and to NHK, the question of financing, the elaboration of the curricula etc. After these problems have been solved the University of the Air is expected to commence its work in April 1973.

C. Conclusions

The report made by the Social Education Council (i.e. its sub-committee) in March 1969 and the suggestion contained therein to set up university radio and television stations, initiated the idea of establishing a "new university" and, in this context, a University of the Air. In fact, this idea was welcomed quite warmly, as it was considered to be an effective way of solving the student troubles of 1969.

Following this development, several viewpoints were published independently of each other expressing the opinions of the government, the political parties, and the broadcasting organizations such as NHK (cf. A.II–IV). This was done especially in November 1969. The report of the Preparatory Study Committee for the University of the Air (cf. A. IV above) presents in some respects an official viewpoint, referring to different points of view and developing them, especially, as far as the opinions of the committees and conferences appointed by the government and the Liberal Democratic Party are concerned.

It may therefore be stated that the report of the Preparatory Study Committee is only indirectly related to the report of NHK "College Education through Television", presented in November 1969. The plan drawn up by NHK has not been developed since and has little influence on the planning and realization of the University of the Air. The report by the Preparatory Study Committee is now directing the entire process of planning and realization (cf. B. II above) in the light of the great interest shown by the public in the University of the Air. In second place, mention should also be made of the study of the Curricula Committee published in the beginning of 1971, which examines the didactical aspects of the radio and television instruction programmes more closely (cf. B. I. above).

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The University of the Air

A Report by the Preparatory Committee

The Prepartory Study Committee for the University of the Air was set up in November 1969 for the purpose of studying basic matters concerning the establishment of a new university which uses radio and television as the main means of instruction. During the last nine months, it met 27 times, including the meetings of its sub-committee, and conducted careful deliberations. The present report sums up the results of its study.

The Report of the Round Table Conference on the University of the Air, which was jointly organized just before the Preparatory Study Committee by the Ministry of Education and the Ministry of Post and Telecommunications, states that the University of the Air should be conceived under an entirely new idea and in the far-reaching perspective of the future education in Japan, without regard to the traditional system. Indeed, it is a new university which has no precedent at all in the past. For this reason, the Committee has conducted its study without being restricted by the existing institutional and legal framework.

Since the University of the Air is envisaged to be a new type of institution different from the existing universities in regard to the means of instruction and other matters, there are problems to be solved as to what place it should occupy in the existing educational system. If the new University of the Air is to be established as a formal university, it becomes necessary to define its relations to the existing system. On the other hand, the higher education system itself is at present undergoing the overall re-examination and it is too early to predict what the future system will be like. During the course of research and study, the Committee paid due consideration for these indefinite conditions.

Under these circumstances, the Committee could not reach the conclusions on such problems as the social need for the University of the Air, its legal status, the manner of radio and television broadcasting, and the method of financing. With these problems to be further discussed in the future, the Committee has decided to publish the present report to indicate the basic scheme of the University of the Air as the result of its study just completed. There may arise the need for the modification of some conclusions of this report as further study progresses in the future.

It is the sincere hope of the Committee that careful study will be made on the problems left for further consideration and that the University of the Air will be established at the earliest opportunity and become an institution of higher education which can meet the needs of the rapidly changing society.

1. *Purpose of the University of the Air*

From the viewpoint of providing people with equal opportunity for higher education, the University of the Air aims to provide a chance to take advantage of higher education for all people: young employees, housewives, and new graduates from high school; and to offer professional and technical training to working people in different industries.

The expansion of higher education is dominant over the world, and Japan has experienced a great increase in the enrolment in higher education since we started a new system of higher education after World War II. Twenty percent of the age group are

now enrolled in universities and colleges. In spite of such situation, however, there are a lot of people who cannot have a chance to be college students, betraying their hope to be. The University of the Air is a wonderful solution for this.

The advancement of science and technology, and the development of economy and society for these days have led to a big change in human life, and there is a faith to have a highly organized society of information and communication. To live in such conditions, human beings are required to have professional or technical knowledge, refined culture, and professional skills, and we have to open a door of life-long education, too. As the first step to realize this, we have to open a door of higher education to all people. The University can give them better lectures than existing universities, and play an important role in life-long education, because the University will be able to use broadcasting very popular among people as teaching media.

2. *Legal Character of the University*

The University of the Air is a university under the Law of School Education. And as we believe the importance to increase more chances of life-long education for people, we will give special certification to only their studied subjects.

The University is the 4 year degree-granting institution defined in the Law of School Education. It might also offer two year courses at the junior college level.

The existing universities are grouped into two types; one is the ordinary institution offering day or evening courses and the other is the correspondence institution which requires the students to use "study guides" at home. The University of the Air may be classified as one of the correspondence institutions because it uses broadcasting as communication media, requiring the students to study most of their study at home, but it might also be classified as one of the ordinary institutions, because the students therein can see and hear the lecturer or experimental demonstration through TV or radio. So, it should be classified as a new type of institution of higher education.

The University of the Air will broadcast most of the lectures, so it is possible for anyone to study through broadcasting even when he is not a registered student, for it is open to the people and this is a very unique character of the University.

There are a great many university graduates and other people who hope to study their own professional or certain other subjects related to their concern without any wish for a degree. To meet the needs of these people, the University of the Air will give them a chance to take a limited number of subjects and give the certificate of the credits aquired. The certificate shall be awarded to the student not only for a single subject, but for a set of subjects which will be explained afterwards. It is desired to develop a new system under which the credits aquired at the University may be linked with public examinations granting professional and other qualification.

3. *Admission Requirement and Classification of Students of the University*

In principle, the University requires for admission the completion of the senior high school course, or its equivalent, but it will also give a chance to the person who does not meet such requirement. The applicant who has completed the required high school course and wishes to complete a university course shall be classified as a regular student. The one who has not completed the required schooling but wishes to complete a university course shall be registered as a special student and given a chance to be transfered as a regular student after he has acquired the prescribed number of credits. The one who wishes only to get the credits of certain subjects shall be classified as the non-regular student.

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Arrangements should be made so that the University may admit those students who have dropped out of a university, or who have completed a course of junior college or technical college.

As the University of the Air emphasizes to provide higher education for every people, principally all applicants shall be registered. Then, besides the regular students, the one who has not completed the required schooling and wishes to finish a university course shall be given a chance to be the regular student recognized by the University. There are many people who wish to take the credits of some special subjects. To meet the needs of these people, the University of the Air will enrol "non-regular" students, too. The University giving no entrance examination, it is necessary to have a good planning and preparation to satisfy all applicants. To confirm the applicants' wish for study and to give them a better understanding about the University, we will have some arrangement for interviews with them.

We have also to do something to find a good solution to recognize the credits awarded at other institutions for those students who have dropped out of a university and who have finished a course at a technical college.

We also need some good scholarship system to help those young employees who wish to be students of the University.

4. *Instructional Methods in the University*

A. *Place of Broadcasting in the University*

Education through broadcasting (TV and radio) shall occupy the most part of education in the University of the Air. Lectures shall be given through broadcasting. Seminars, experiments, and practical work are given through both broadcasting and institutional schooling. The total class hours of broadcasting and institutional schooling should be equal to those for existing universities.

In the University of the Air, broadcasting will be utilized in those fields where teaching through broadcasting will be able to achieve educational objectives, while institutional schooling will be offered to ensure effective application of academic knowledge acquired through broadcasting and to ensure concacts between teacher and student, and among students themselves.

A lecture course should require 15 hours per one credit as in day-courses at existing universities. This means that all lectures now given in classrooms at universities shall be given through broadcasting. So the University of the Air is quite different from existing correspondence institutions, but is a very new one. The textbooks (A 5 size, 75 pages per one credit) required by the correspondence university is not necessary for the University of the Air. Of course there there will be need of books or handbooks to ensure effective education through broadcasting. The questions from the student should be answered both through institutional schooling and through a variety of communication media. A seminar course will require 30 hours' study, which will consist of 15 hours each of broadcasting and institutional schooling. And the subjects involving experiment and practice will require 45 hours per credit, which will consist of 15 hours' broadcasting and 30 hours' institutional schooling. Seminar is mostly composed of debating while the introductory lectures and the explanation and demonstration of experiment and practice can be given to the student very effectively through broadcasting.

When institutional schooling and broadcasting shall be used together for the subjetcs accompanied by seminar, experiment, and practice, these are better to be given simultaneously. This means that the same amount of broadcasting hours can do the equal education with the traditional classroom teaching.

The education through broadcasting might do more than the present classroom teaching, for it is able to use AV devices for production of programmes. So, if we can use the same amount of hours with the present classroom teaching for education through broadcasting, we can give them the high qualified educational programmes worthy of those given at the present universities. We believe this is one of the ways to make it possible to initiate transfer of credits between different universities. We ought to conduct a better research and survey to know the efficiency to education through broadcasting of different subjects.

There should be more inventions and development of educational devices or facilities and VCR (Video Cassette Recorder). Then we have to endeavour to develop these and find effective ways for educational application and further to innovate the educational techniques.

B. Implementation of Institutional Schooling

Institutional schooling at the University is composed of the required schooling and optional schooling. And there should be at least one learning center in every prefecture to which a certain number of full-time faculties will be assigned, and active cooperation from the existing universities will be extended with regard to the faculty, facilities, etc., of the center.

The primary purpose of institutional schooling is to secure for its students access to seminar, experiment, and practice, all of which cannot be adequately performed by broadcasting alone, and to provide them with invaluable chances to nurture esprit-decorps and to explore themselves to stimulating academic atmosphere through direct, mutual contact between teachers and students or among students themselves. The required schooling of seminar, experiment, and practice is obligatory for those who want to satisfy the requirement for credits. As we have explained already, in the seminar, experiment, and practice, instruction by broadcasting and by schooling should go hand in hand, so that the required schooling shall be given, in principle, on Sundays or some special days evenly scattered throughout the year with some consideration given to the necessity of concentrated courses.

The optional schooling consists of question and answer series, specially arranged lectures and seminar conducted by broadcasting lecturers etc., and the self-study by students in the learning center, to all of which the students can attend on their initiative.

Institutional schooling of the University of the Air will take place in various places evenly found throughout the country. In its implementation, it is vitally necessary to ponder over the measures to court generous co-operation from the existing universities, on the basis of which at least one learning center should be set up in every prefecture. There should be, in the learning center, the seminar rooms, the library equipped well with audio-visual aids and equipment, and facilities for experiments and practices.

The implementation of schooling will also require those educational experts who are capable of maintaining organic relations between broadcasting and schooling, and conducting scrupulous educational guidance.

C. Certification of Credits

The credits for the subjects of lecture will be certified at the end of each semester through a special examination conducted at a given place and the credits for the seminar, experiment, and practice will be authenticated by the evaluation of achievements observed during the institutional schooling.

In order to make success of the University of the Air, we have to endeavour to establish a social reputation by sending out to society many a graduate of really good quality. Testing for the certification of credits in the University of the Air, therefore, should be strictly controlled and operated. There will be provided several chances for taking an examination in each subject, for some employed students might fail in attending an examination given on a specific day.

The credits for the seminar, experiment, and practice will be authenticated through the evaluation of work achieved during institutional schooling.

In principle, at least one report will be required of each subject, when it is not accompanied by the seminar, experiment, or practice. The report will be used to evaluate the ability of the student to continue his study, and will also be used, together with the credit-certifying examination, for evaluating his achievements in his course subjects.

D. Requirements for Graduation

In order to graduate from the University of the Air, all students are required to have 124 credits at least. The minimum years of study to graduate from the University is four years, but they can study as many years as they wish. One semester is 15 weeks, and there are three semesters per one school year. In order to graduate in four years, the student has to take two hours study through broadcasting per day and to attend the required institutional schooling and the credit-certifying examination of 10—19 days annually.

The University of the Air will require 124 credits for graduation in accordance with the prevailing standard stipulated for conventional universities.

There is some necessity to increase the annual number of studying days because the employed young people can not so easily adjust their study hours to the programmed hours of broadcasting by the University. Three semesters of 15 weeks each in one school year should be established by setting aside 7 weeks out of the annual total of 52 weeks, which will be used for registration, credit-certification, graduation or testing.

Under the above requirement, the University of the Air has decided on the number of study hours spent for broadcasting, required schooling, and the required attendance for testing as follows:

A-Course (Not requiring Experiment or Practice)

	Required hours for graduation	Yearly hours of study	Broadcasting			Institutional Schooling		Test Days or Attending Days
			Semester	Week	Day	Year	Required days of attendance	
Lecture	108 c 1620 h	405 h	135 h	9.0 h				29 h (6 days)
Foreign Language	8 c 240 h	60 h	20 h	1.4 h				
Seminar	8 c 240 h	60 h (B 30 h*) (I 30 h)	10 h	0.7 h		30 h	4 days	
Total	124 c 2100 h	525 h	165 h	11.0 h	2 h	30 h	10 days	

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B-Course (Requiring Experiment or Practice)

Lecture	100 c 1500 h	375 h	125 h	8.3 h				27 h (6 days)
Foreign Language	8 c 240 h	60 h	20 h	1.4 h				
Seminar	4 c 120 h	30 h (B 15 h) (I 15 h)	5 h	0.4 h		15 h	13 days	
Experiment or Practice	12 c 540 h	135 h (B 45 h) (I 90 h)	15 h	1.0 h		90 h		
Total	124 c 2400 h	600 h	165 h	11.0 h	2 h	105 h	19 days	

* B = Broadcasting
I = Institutional schooling

c = credits
h = hours

The study hours arrangement in the above chart is made in consideration of the following points.

1. The number of subjects requiring institutional schooling will be varying with the course selection, and the minimum is 8 credits and the maximum 16 credits. The following shows A-course (not requiring experiment or practice) of minimum institutional schooling hours and B-course (requiring experiment or practice) of maximum institutional schooling hours.

	A-Course	B-Course
Lecture (General Education, Professional)	108 c	100 c
Foreign Language	8 c	8 c
Seminar	8 c	4 c
Experiment, Practice	0 c	12 c

2. The schooling hours in the learning center is 8 hours a day.
3. One hour testing per credit is required of the certification for the subjects of Lecture or Foreign Language.

5. Education in the University

A. Fundamental Idea of Education

The University of the Air will organize a comprehensive, flexible and new curriculum, unconstrained by the present system of schools or departments in the existing universities and do its best to educate people having enough ability and knowledge to cope appropriately with this changing and developing world.

We have to endeavour always to renew our knowledge and technique so as to keep up with the drastic changes of society, accelerated by successive innovations in modern science and technology. The man who can cope well with such a changing world should have not only some specialized knowledge, but fundamental academic attainments and academic ability in research. To put another way, he has to cultivate the ability to probe into his professional field from the wider perspective. The University of the Air will reorganize the general education completely, aiming at realizing complex or overall combinations of professional subjects while paying due consideration to the academic research method of each different professional field, and will organize, without regard to the current system adopted in existing universities, such a curriculum as flexible enough to arrange each subject in line with its true educational purpose.

The above curriculum of the University of the Air might assume an important role in providing its students, mainly working people, with invaluable opportunities to enjoy not only a formal higher education but a life-long education, the major purpose of which is to rebuild and stock knowledge and information necessary for their jobs.

B. *Constitution of the Curriculum*

The University of the Air will have the basic lines of its curriculum composed of Technology, Natural Science, Social Science, and Humanities. As for the professional curriculum, there will be provided various sets of mutually related subjects, covering one or more than two Lines, and each amounting to 12 credits, and those sets will further be combined into diverse courses.

We may define the Line as the department of the current university, but it is not so much independent as is seen of the present department, but rather a loose grouping of subjects in each academic field.

There will be several basic courses of professional education in each academic Line. And, to give more flexibility to the curriculum, there will be many courses consisting of diverse subjects besides the basic courses. The combination will be arranged not only inside each Line but between different Lines. However, this does not mean the simple combination of some subjects but the well-organized combination of the subjects, motivated by some academic principle. For this purpose, a somewhat coherent combination of the subject is organized into the sets, which are combined into the course. This will help the student to select the subjects or courses according to his academic purpose.

The Set is organized usually by the subjects of 12 credits. The Set is the combination of professional subjects to study one particular field from the different angles, or the combination of different subjects to study some academic field step by step. This can help the student not to waste his time for some fragments of knowledge or information, but to study well about the so-called border-line field among professional or academic fields.

C. *The Subjects Taught at the University*

The subjects taught at the University of the Air will be grouped as General Education, Foreign Language, Physical Training, and Professional Education, based on the standard of the current regulation of higher education. The subjects in General Education will be organized in terms of three major Lines, each 16 credits, i.e. Humanities, Social Science and Natural Science. Foreign Language will the three subjects, 8 credits each, and as the subjects in Professional Education there will be Mathematics, 12 credits, common to all courses, 70 credits of the fundamental professional subjects, more than 36 credits of the Professional Education in each Line, and 4 credits of Physical Training.

Various sources believe that the General Education is not so effective as it was once expected, so that they wish to see more improvement about it. The General Education in the University of the Air should not merely give some introduction or outline of the subjects, but emphasize the importance to have specialized study of some specific theme, field, or age. This would enhance students' ability in academic analysis or solution of their problems.

As mathematics is becoming crucially necessary for future citizens of our society, the University of the Air will require all its students to study Mathematics whatever their courses are. The fundamental professional subjects will aim at giving the student enough understanding of fundamental knowledge or academic methodology of Humanities, Social Science, and Natural Science.

The fundamental subjects of each Line for Professional Education is 36 credits, and they will give the student a comprehensive and academic education in each field. When we operate broadcasting of TV or radio for 18 hours each day, we can arrange 15 basic courses, covering all Lines.

In arranging concrete items of subjects, sets and courses, it is vitally important for us to closely observe real social needs and people's demands in the context of our dynamic society.

D. *Study at the University*

Those students who wish to graduate from the University of the Air have to study more than four academic years (12 semesters), and take more than 124 credits according to the following prescription:

1. *The General Education is of 36 credits, 12 each from Humanities, Social Science, and Natural Science.*

2. *Foreign Language is of 8 credits of one language.*

3. *Physical Training is of 4 credits of practice and theory.*

4. *The subjects of Professional Education involve 12 credits of Mathematics for all courses, but when some special course does not require mathematics so much, it is possible to unload it to 4 credits and to require the student to take 8 credits of some other professional subjects.*

5. *The student has to take 24 credits of two Sets from the subjects of Fundamental Professional Education.*

6. *The student has to take 36 credits of three Sets. Besides, 4 credits in some subject of Professional Education, considered appropriate for one's educational purpose, will be required.*

The General Education is not limited to the fundamental as we explained in 3. but rather highly sophysticated in some parts. And it is required to be taken throughout four years, not in the first two years as it is with the existing university. The subjects of Foreign Language and Fundamental Professional Education should be studied in early years of college life, for these are the foundation of college study for the student. The student can take some of the subjects of Fundamental Professional Education from the first year so as to satisfy his keen interest in the deeper professional and academic study. The guidance in the selection of Sets will be given to make each student study systematically what he wishes.

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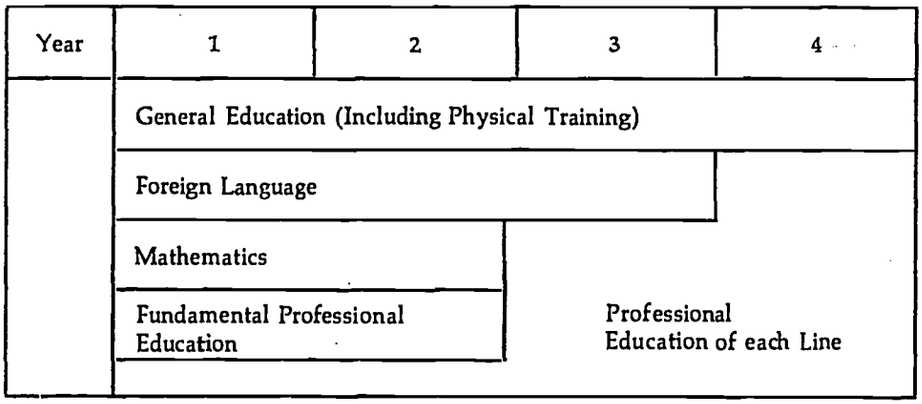
The following chart shows the standard case of yearly allocation of subjects:



E. Programming of Broadcasting of the University

The University of the Air will broadcast its programmes by TV and radio from Monday to Saturday, from early morning to late night: It will broadcast General Education (48 credits) common to all professional courses, Foreign Language (24 credits), Physical Training (2 credits), Mathematics (12 credits), Fundamental Professional (70 credits), and professional subjects of each Line (4 foundation courses, 144 credits), early in the morning and late at night. In the daytime, it will broadcast the subjects of Professional Education (11 foundation courses, 396 credits). It will also broadcast the programmes of the graduate course level in the afternoon of week-days and on Sundays.

The most convenient study hours for young workers and professional people are early in the morning and late at night. So, General Education, Foreign Language, Physical Training, Mathematics, and Fundamental Professional Subjects will be broadcast at night. The subjects of Professional Education (144 credits, four foundation courses) will be broadcast early in the morning and late at night. As those four foundation courses have to respond to the need of many people, we believe it is better to reorganize those into General Science and Technology Course or General Humanities and Social Science Course, which can give them a wider perspective. This means students can graduate from the University only by studying through broadcasting late at night and early in the morning, or late at night alone.

The housewives and new graduates from the high school can spare the daytime for their study, and if they can further study the required common subjects at night, they can take enough credits for the graduation. It is believed very important to have the Graduate Course in the University of the Air in order to make the University more enriching and to provide widely an open door university education of higher level in line with the elevation of life-long education. However, it is necessary to have better faculty and facilities for the graduate course. So, for a while, the University of the Air will broadcast the programmes of high quality worthy of the Graduate Course lecture with no credits certified. By the time we see the first graduates sent out, we have to institute the Graduate Course (Master Degree Course). And, we also have to plan the special one year course for the professional training of the in-service teachers.

The following chart shows one example of weekly programme planning of broadcasting for 18 hours a day. This shows the scheme of the 4th year after the opening of the University, and until the year there will be some rebroadcasting of programmes.

	Monday — — — — — — — — — — — Saturday	Sunday
6.00 a.m.	2 Foundation Courses (72)	
7.30	11 Foundation Courses (396)	
12.00		
3.45 p.m.	Graduate Level Lectures	
6.45		
	General Education (48) } Common to all courses Foreign Language (24) } Physical Training (2) } Mathematics (12) }	Graduate Level Lectures
	Fundamental Professional subjects (70)	
12.00	2 Foundation Courses (72)	

1. This plan is common to TV and radio. 2. One lecture hour of broadcasting is 45 minutes. 3. The number inside ( ) shows the number of credits.

We have to endeavour to find a proper way to use VCR and so on to give the student more convenient way of study.

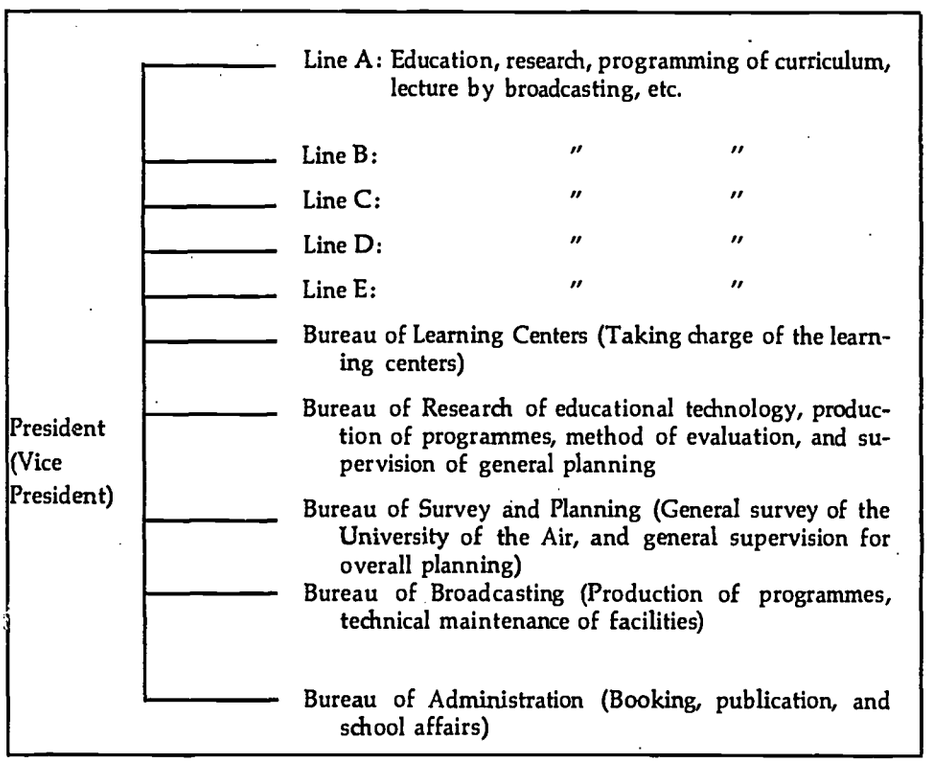
6. The Foundation and Administration of the University

There are two different ideas of the foundation of the University of the Air, and one is the government and the other is the special legal body. On the decision of this problem, there should be very careful considerations given to a responsible administrative system, excellent faculty members, financial stability, efficiency of accounting, fulfilment of the social need, and exclusion of the narrow-minded character of the university people. To secure an efficiently operating system for the University, it is important to divide its functions among education, research, and administration. And to enforce the particular character of the activities of the University of the Air, we have to endeavour to institute a new administration system for the University. This means to clarify the responsibility of each department or bureau, and to organically unite them into higher efficiency.

The National Council of Education shows two ways, in the report of "The Fundamental Problem of Improvement in Higher Education", for the issue of the legal body and administration system of the government university, national or local:

1. to set up the legal body to run as the government university, receiving public financial support, and keeping independence under its own responsibility, and
2. to revise the administrative system completely to clarify the relation with the founder of the university and the responsibility as the government university. As it is aforeseeable in this report there should be important changes of the legal body or running system of the governmental university in the near future. Therefore the University of the Air should renovate the conventional system even if it is governmental. And, when the University of the Air is to be established as an independent legal body, it should not follow the old way of the semi-governmental organization, but we should set up some special legal body to realize the unique purpose of the University of the Air.

We have to be careful to organize the board of trustees, the university council, and the faculty, in relation to the form of foundation, and decide clearly on the way of voting and how to share the function and role among research, education, and administration. The following organization of departments or bureaus are necessary as the administrative system of the University of the Air. The bureau of broadcasting is one part of the administrative system, but its character should be scrutinized in relation to the way of broadcasting.



There will be the Department of each Line, the Bureau of Learning Center, the Bureau of Broadcasting, the Bureau of Research dealing with educational technology and usage of computer, the Bureau of Survey, and the Bureau of Administration for the University of the Air.

The faculty organization and members should be flexible enough to adjust well to the development of society or academic studies, and have the arrangement to exchange the professors with another Line. There will be guest professors, the full-time professors and assistants in the head-quarters of the University of the Air, and the full-time or part-time teachers and the full-time assistants in the learning center. Each faculty member performs the educational or research function according to each professional field, and belongs to each Line.

We will invite some prominent professors as the guest professors, and some time from abroad, too. We will ask them to broadcast their lectures. The full-time professor will take the responsibility for forming the curriculum, making the lectures through broadcasting, and supervising the activities in the learning center. The full-time assistant will work for the guest professors and the full-time professors. The full-time teacher in the learning center will take the responsibility for schooling in close co-operation with

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the full-time professors in the headquarters. The full-time teacher will, together with the part- time teacher, take charge of the institutional schooling. The faculty member of the University of the Air will be employed under the term-contract.

7. The Operation of Broadcasting

The system of broadcasting of the University of the Air, its primary medium of education, should be so organized as to realize the intended purpose of the University.

There will be two possible ways of broadcasting for the University of the Air, and one is to give the broadcasting license to the University, and the other is to give it to the independent broadcasting body. Each way can realize many different ways of construction of the broadcasting facilities, running the station, producing the programmes, and maintaining the station facilities.

It is rather hard now to make the final decision on the way or type of the broadcasting, but, anyway, we have to endeavour to find the best educational system for the University of the Air.

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The Broadcast Correspondence High School

This report was compiled and edited by Wilbur Schramm, Director of the Institute for Communication Research, Stanford University, with assistance in the preparation by Isao Amagi, Director, Administrative Bureau, Ministry of Education of Japan, Kazuhiko Goto, Radio and Television Culture Institute, NHK, Masunori Hiratsuka, Director, Japanese National Institute for Educational Research, Hirosuke Eguchi and Yukihiro Kumagai, Radio and Television Culture Research Institute, NHK.

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The Background

When the NHK Correspondence Senior High School came into existence, in 1963, over 99 per cent of healthy Japanese children of appropriate age were enrolled in the first nine grades of the public school system. But only about half of the students who completed grade 9 found places in senior high school.

This inability of so many qualified students to continue their formal education beyond junior high school had for some years been a matter of concern in Japan. Students felt that they were under inordinate pressure to survive the ninth-grade cut. Parents felt that many children were being deprived of better job opportunities. Officials realized that many children had the ability to profit by furher schooling and thus were not being allowed to develop their talents fully. Out of this situation, repeated annually for a number of years, came the idea of teaching high school work by correspondence. The first high school correspondence course was offered in 1948. By 1963, nearly 100,000 high school students (mostly young workers) were enrolled in a variety of courses; 735 full-time teachers and 2078 part-time teachers were giving the courses; more than 200 administrative personnel were assigned to the operation; and sixty-six correspondence schools were active with over 400 other schools co-operationg.

The NHK school represented a marriage of this correspondence study tradition with educational broadcasting. School broadcasts, like correspondence courses, were much older than the NHK school. Radio programmes for schools began 1933; and the first programmes specifically designed to accompany correspondence work had been offered in 1951. These programmes were prepared by the Sendai regional central station and broadcast to that part of the country. The first courses were in the subjects Japanese, English, and Science. In 1953, NHK began to broadcast correspondence-related radio programmes nationally. Soon the beginning courses were turned over to local stations and NHK network programming was concentrated on senior high school courses.

Course offerings were gradually expanded, and in 1960 senior high school programmes were telecast for the first time on the national educational television network.

In that first year, Chemistry, General-Electricity, Mechanics and Mechanical Drawing, Descriptive Geography, English, and Guidance were taught by television. Biology was added in 1961, and the same year plans were initiated for a university-level correspondence course supported by television broadcasts. By 1963, a majority of the subjects in the high school curriculum were covered by broadcasts; the same subjects, usually with the same teachers, were broadcast on both radio and television. Six additional courses were added in 1965; and some eight additional subjects were to be added to meet the requirements set by the Ministry of Education.

Thus, by 1963, there was a well-developed programme of correspondence study available in Japan at the high school level, and an extensive series of television and radio broadcasts designed to aid the correspondence students. It should be noted that Japanese broadcast correspondence education has developed in a pattern differnt from most correspondence systems in that the student is given much less opportunity to work at his own pace; rather, the broadcasts pace him. He submits his papers and takes his examinations at scheduled times during the school year. He takes fewer subjects than resident students because he is working at a full-time job. However, the work he does take is scheduled on the pattern of the regular school year. The Japanese correspondence plan is also different from most plans in that it includes a certain number of days each year to be spent in a school, so that the correspondence student may have some of he advantages of group activities and direct supervision from a teacher. The requirement is usually that the correspondence student must spend twenty days a year in this manner, but is reduced by three-tenths if he follows the radio courses, five-tenths if he follows the television, and six-tenths if he follows both radio and television courses.

This is the pattern into which the NHK school was introduced in 1963. The new school came into being for two reasons. Primarily it was to serve as a place where the combination of broadcast and correspondence work could be studied, perfected, and demonstrated — in other words, to be a kind of exerimental and demonstration school for the new method. Second, the NHK school was to operate on a national scale; unlike the local correspondence schools it was to have all Japan as its campus, and students of all kinds from all parts of the country were to study and to be studied in it. Of course, the new school rapidly grew to such a size that it does not fit the typical pattern of experimental schools; nevertheless the function of testing and improving of methods remains an important part of the school even while it performs its service function of bringing secondary education to many thousands of students.

The School

The NHK Correspondence High School was established as a juridical person, independent from NHK itself. Therefore the school, rather than NHK, is in charge of the correspondence courses; and NHK is in charge of the broadcasts which are designed to accompany correspondence study. These broadcasts are not limited to the students of the NHK Correspondence School, and indeed are used by students of all correspondence schools in Japan. However, they are an essential part of the NHK school curriculum. Unlike most instructional television throughout the world, these broadcasts are considered not as supplementary but as essential to the course; the correspondence students in effect attend class by listening to or viewing the NHK programmes. The school was designed to serve as a pilot project in the combination of broadcasts with correspondence study, to establish models for programme utilization, and to collect data for programme improvement. Therefore, although there is no control by NHK over the school, the relationship remains very close.

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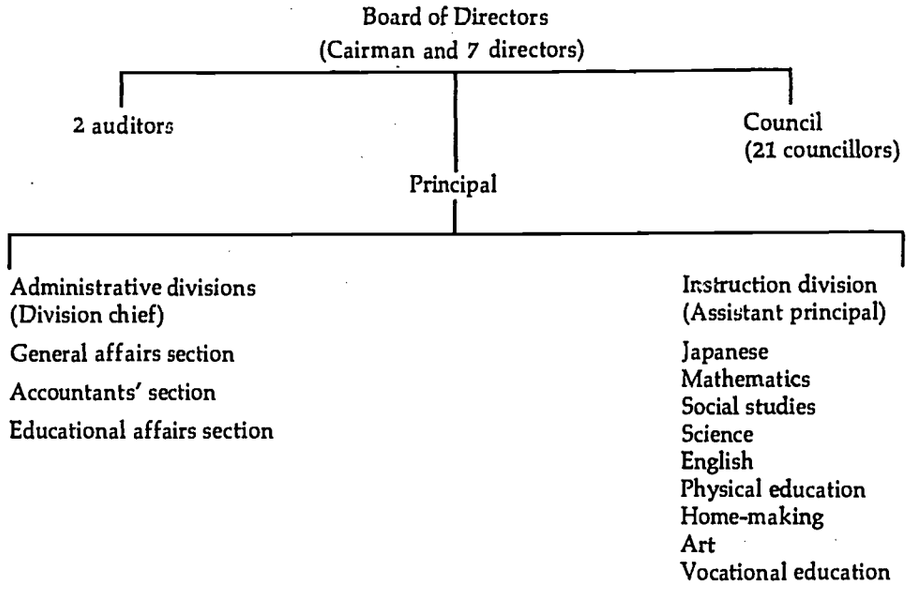
The organization of the Correspondence High School is outlined in the following:



On the staff of the school, in addition to the principal officers named, are 108 teachers and 54 clerks. In addition, there are four part-time instructors; and about 200 outside instructors are called upon at various times during the year to assist in correcting examination papers.

The school itself has a centre and a two-storey dormatory building with accomodations for 102 persons in Tokio.

A large proportion of the students do not go to Tokyo to take their special education and their examinations at the main school. Rather, they go to co-operating schools, which are available in all parts of the country. As of 1970 the number of these co-operating schools was seventy-five. Officers of the central school hold frequent consultations with the principal and superintendent of each co-operating school, so as to make the schedule, the requirements, and the class work uniform throughout the country.

Co-operation between NHK and the school is extended on a nation-wide scale by administrative arrangement. The directors of all NHK's central and local stations are asked to take part in the NHK school work as counsellors. For each station having a co-operating school located in its service area, a special staff member is appointed to consult with the school on the relation between the broadcast and correspondence work, and to give guidance and assistance to the students.

The school year begins in April. Enrolments are invited in each prefecture by advertisements in newspapers, posters, and pamphlets, as well as by broadcast announcements. Those who have completed the full three-year course of junior high school, or who are recognized by a junior high school principal as having equivalent scholastic attainments, are eligible.

The Students

In its first year, beginning April 1963, the NHK school enrolled 11,721 students. In the second year, the enrolment was 12,091, in the third year 13,915, and in the fourth year, 12,005. Although the average number of new entrants in the last four years is

about 6,000 each year, it was reduced to 4,809 last year (1970). Each year, females have outnumbered males in the students body. As for the new entrants enrolled in April 1970, 2146 are males and 2664 are females.

Over 50 per cent of the students are teenagers. Nearly 35 per cent are in their twenties, about 12 per cent are in their thirties, about 2 per cent are in their forties, and just a handful are still older. Nearly 22 per cent of the students come from Tokyo; the others are from all parts of Japan. About 19 per cent of the present enrolment are factory workers. The following chart shows the distribution of the students occupations.

Types of occupations	NHK School enrolment in % *
Factory workers	19.0
Nurses	11.7
Engineers	10.1
House wives	7.6
Beauticians, Barbers	6.0
Clerks	5.0
Public Service workers	4.7
Unemplyed	4.4
Shop workers	4.1
Agriculture and marine industry workers	3.4
Members of the defense forces	3.1
Transportation workers	2.4
House maids	2.0
Others	15.2

3693 students had been questioned.

Thus a very wide range of occupations is represented; and almost all the students are holding full-time jobs while enrolled in school.

This latter fact, of course, makes it more difficult for the students to finish the curriculum in the allotted four years. A full-time student completes high school in three years. However, in order to avoid undue strain on young people trying to work full time and study at the same time, no correspondence student is permitted to complete the course in less than four years; and only the ablest can do this. For example, of the 11,721 students who entered the school in April 1963, only 32 per cent entered the third year class in 1965. Students are not permitted to enter the third year until they have completed all the required work of the first years. Although the percentage of students who stay in the correspondence course decreases respectively with the number of years they are in school, the following table shows an upward trend. Each year the percentage of students who stay in school for their second, third fourth and fifth years, and who have graduated has increased.

The year	1963	1964	1965	1966	1967	1968	1969
The 1st year	—	—	—	—	—	—	—
The 2nd year	47.0	52.0	57.9	41.7	65.1	61.6	62.7
The 3rd year	31.8	37.9	42.7	48.9	50.7	46.5	—
The 4th year	27.3	34.3	37.3	59.1	42.1	—	—
The 5th year	7.2	8.8	9.2	10.5	—	—	—
	(17.5)*	(21.6)*	(23.8)*	(26.1)*			

* The numbers in parenthesis show the percentage of students who completed all the required courses at the end of the fourth year.

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When the new students enrolled in the 1970 academic year, they were required to state their motives for entering the NHK Correspondence High School. The responses were as follows: 53.2 per cent said they wanted to be educated; 23.4 per cent believed it would be useful for their work; and, 20.7 per cent said they were interested in receiving a high school diploma.

One very interesting observation on the student body of the NHK school is that the school is bringing back into academic life a number of people who have been out of school for a long itme. As for the 1970 class, 26.5 per cent had completed 9th grade education more than ten years ago, and 21.5 per cent had finished their education more than five years ago and 22.0 per cent had finished their education more than three years ago.

The Curriculum

The courses taken by NHK students are comparable in every way to those followed by students who go to local schools; but the NHK curriculum is divided into four years, rather than three. If a student does not satisfactorily complete all his first-year subjects, he must repeat the ones he has not passed. He must complete all his first and second year subjects before he may enter the third year.

The students are expected to submit papers and reports for each subject on specified dates throughout the year. If fewer than the required number are turned in, credit is not supposed to be granted for the course even though the examinations are passed. Reports are corrected and graded and returned to the student by the NHK school. The number of reports required varies with subjects. For example, nine reports are required for Mathematics I, six for Physical Geology. Preliminary examinations are held in July, September, and November, and the final examination in February of each year. Not all subjects are necessarily tested in each examination.

In addition to doing the correspondence work and attending to the broadcasts, the student is required to be present for about twenty days of schooling per year, either at the school at Tokyo or at one of the co-operating schools elsewhere in the country. The school attendance is designed to supplement the correspondence student's contacts with the teachers through mail and broadcast, and to give him some little taste of school life and acquaintance with his fellow students. During these days, the student receives special guidance in each subject, takes part in special educational activities etc. These special days for correspondence students are arranged at the Tokyo school ten times a month, mostly on Sundays and Saturdays, and on one Monday and one Tuesday each month.

The years's work is judged and graded in March. Collective judgement is given by the graders on each subject, and takes into account: a) the number of reports submitted and their quality; b) attendance at regular schooling; c) results of examinations. A five-point marking system is used. A grade of less than two is not passing. Final decision in each case rests with the school principal. Subjects on which a student does not receive a passing grade must be repeated in the following year.

Textbooks and Study Materials

The correspondence students, in their home study, use textbooks selected by the National High School Correspondence Education Research Association from among the high school textbooks authorized by the Ministry of Education; textbooks thus selected are used at all correspondence schools across the country. For the students using broadcasts, work books (study guides) are prepared so as to fit in with and supplement the chosen textbooks.

To compile the broadcasting work books, a committee is set up, composed of representatives of the National High School Correspondence Education Research Association, the writers of the textbooks, the broadcasting lecturers, and the NHK Correspondence School broadcast division. They examine and revise an outline for each of the books, which are actually written by the lectures who are going to give the broadcasts. Then the books are printed by the Nihon Hoso Shuppan Kyokai, an affiliate of NHK, and are ready for use in the school year beginning in April. In addition to the textbooks and broadcasting work books, a monthly magazine is published, The NHK School, which provides supplementary instructional materials and information about the school. There is also a booklet, Guidance In Study, which is written and revised as often as necessary by teachers of the NHK school.

The Organizational Framework

The radio and television courses are broadcast six days a week at choice evening hours (8 to 11 p.m. for radio, 9 to 11 p.m. for television) and Sunday from 10 a.m. to 2.30 p.m. for television and from 6 p.m. to 11 p.m. for radio. In many countries, of course, these hours would not be available for instructional television; but Japan has an educational television network which is used for school broadcasts during the day and for correspondence study broadcasts and related purposes in the evening.

The same lectures and the same textbooks are used for radio and television broadcasts, and the same courses are represented, although an elective subject such as Calligraphy, which depends so much on visual demonstration, is on television only. In scheduling, priority is given to the needs of the first-year students. For this reason, courses such as English(1), Mathematics I, Modern Japanese(1), Physical Education, and Home-Making are broadcast at the most desirable hours. Special care is taken to help the correspondence students master mathematics. Most of these students enter the Correspondence High School three to five years after graduating from junior high school, and many of them by that time have forgotten their previous mathematics courses. This weaknees in mathematics is reflected in the lack of progress in science and certain other subjects. Therefore, a course in junior high school mathematics is broadcast throughout the year as a review. Finally, courses are scheduled so that the same subject is not broadcast simultaneously on radio and television. This ensures that the same teacher can teach the same subject on both media, if the broadcasts are live, and also that a student who wishes to gain extra help by hearing the subject discussed twice may do so.

The Japanese Ministry of Education stipulates that the curriculum for senior high schools include academic subjects, special educational activities, and school events.

Special educational activities are intended to foster desirable attitudes and the development of personal character and of the democratic way of life. The programmes of special educational activities are individually arranged by each regional central broadcasting station, taking into account regional differences.

On the radio, materials convenient for individual listening in the home are presented as special educational activities. These programmes deal with some of the special problems and concerns of the NHK students. Some of the titles of these programmes are: 'Our Problems Reading', 'Our Problems Changing Jobs,' 'Preparations for Exams', 'Using our Time Wisely', 'How to Make a Report', 'How to Use the Educational Broadcasts' etc.

On television, special educational activities are conveniently arranged for group viewing in the homeroom during schooling sessions. Each programme is designed to present a problem and a clue to solving it, so that a discussion can be held on the problem following the broadcast. For instance, there are such programmes as 'A Film Showing

the Life of Students in the Correspondence High School', 'A Diary of Entering the School' by drama, as well as 'Let's Get into Company' and 'A Record of Club Activities' by film and discussions.

The homeroom hour is arranged so as to be suitable for group listening at schooling sessions. The contents include such programmes as 'An Explanation of the Correspondence Education System', 'How to Make a Report', 'A Discussion about Friendship' and 'This Month's Counselling' where students' troubles are discussed in a practical way.

In using the broadcasts at home, students are advised to follow this pattern:

1. Check the broadcasting schedule to make sure when courses are broadcast.
2. Prepare for the broadcast lessons by studying the textbook and the work book.
3. Listen to or view the required broadcast.
4. Review the contents of the broadcast.
5. Complete the required report or other recommended activities.

Planning and Producing the Broadcast Programmes

The broadcast programmes that form part of the curriculum are written and produced in the correspondence school broadcast division of the NHK education department. The process of producing these programmes begins in March of each year, when decisions are taken as to what programmes are to be made for the school year beginning thirteen months later. As soon as basic decisions are made, the correspondence school broadcast division plans the contents of the desired programmes. In this process, the planners confer repeatedly with the NHK Correspondence School, and take account of nation-wide surveys of opinions by the NHK Radio and Television Culture Research Institute, the study results from schools commissioned by NHK to study the courses, and all other appropriate feed-back from previous years. When the director of the education department has approved the course plans, they go to a committee of the National High School Correspondence Education Research Association, which is an independent organization representing all the correspondence high schools of Japan. A representative of the Ministry of Education takes part in the deliberations of this committee.

When the committee has finished its work with the course plans, the total programming plans is sent to the programming section within NHK, and conferences are held to determine scheduling and other arrangements. This planning is finished by the end of September.

At the same time, work is being done to select the broadcast lecturers and to organize in detail the written plans for broadcasts. Lecturers are chosen if possible from among the writers of current school and broadcasting textbooks. When it is not possible to find suitable lecturers among them, selection is made from other sources. Final decision is made by the director of the education department. The lecturer in each course takes part in the drafting of plans and the making of schedules. All this work is completed some time in December, and the plans are published.

The published plans are then submitted for comment to all the correspondence schools of the country. The committee of the national association mentioned above is called back into session to act on the opinions and suggestions sent in by the correspondence high schools.

The long process of planning is completed at the end of January or the beginning of February, when the plans are formally adopted. At some time in February — nearly eleven months after the first decisions were taken — the correspondence school broadcast division begins to produce the programme for the year beginning in April.

A pamphlet of about fifty pages, describing in detail the broadcasting plan that will be put into effect in April, is prepared for NHK's local stations. At the beginning of March, the detailed plans for courses and schedules are delivered to each correspondence high school throughout the country. In April, registration takes place; and the courses begin.

The courses are carefully studied and evaluated twice a year, in June and October, by representatives of the National High School Correspondence Education Research Association, the NHK Correspondence High School, the broadcasting lecturers, and the NHK Correspondence School Broadcast Division. About ten members examine each course, review sample programmes and raise questions for checking and discussion. In addition, fifteen schools throughout the country are asked to survey the use of the course materials and broadcasts by students in their schools. This survey is reported in Tokyo in February of each year. Thus a considerable amount of feed-back information is available to guide the planners and producers of programmes and text materials.

Expenses Paid by Students

As the following table indicates, students in the NHK Correspondence Senior High School are required to pay tuition and other fees, and expenses for textbooks and study books. If radio or television receivers are not available to them, they may have to purchase receivers; and they must pay board during their periods of residential schooling. The boarding expense of correspondence students varies from $ 0.60 per day in the NHK school facilities to $ 1.50 in certain other school residential facilities. If the average student spends ten days in residential schooling, and pays $ 1.10 a day for board, his total expense for this period is about $ 11.

Student's expenses: tuition, fees and books

Type of expenditure	(in dollars)	
Tuition	2.70	
Teaching material fee	2.50	7.20
Correspondence fee	1.60	
Student society fee	.40	
Cost of textbooks	3.70	9.00
Cost of study books	5.30	
Total	16.20	

Very few correspondence students have to buy television or radio receivers. Over 90 per cent of all Japanese households have both television and radio, and the number of households with more than one set of each kind is increasing particularly with the advent of colour television. If however a student must buy both a television and radio receiver, and if the cost of receivers is amortized over the length of a correspondence high school course (about four years), and it is calculated that the receiver will be used no more than 20 per cent of the time for correspondence broadcasts, then one can say that about 5 per cent (20 per cent times 20 per cent) of the total cost of the receiver should be charged per year to its use for correspondence lectures. The average cost of the radio receiver in Japan is estimated at $ 16, and of a television receiver at $ 116; therefore the cost of receiving radio lectures can be estimated at $ 0.80 per year, of television lessons at $ 5.80. The following table summarize these costs.

Total cost to a student (in dollars)

Type of expenditure	TV students	Radio students
Tuition and fees	7.20	7.20
Textbooks and study books	9.00	9.00
Residential schooling (board)	11.00	11.00
Proportional cost of receiver	5.80	.80
Total	$ 33.00	$ 28.00

Needless to say, the amount paid by full-time and part-time students for transport, supplies, Parent-Teacher Association (PTA) fees, and other current expenses is much more than what these totals indicate. According to the 'National Survey of Educational Expenditures in 1967', published by the Japanese Ministry of Education, the average annual current expense of a full-time high school student in 1967 was $ 261, and of a part-time high school student, $ 232. The tuition fee is $ 26.40 for the full-time student, $ 9.50 for the part-time student.

Lessons of the Japanese Experience

Effectiveness of the Broadcast Correspondence Teaching

Although broadcast correspondence high school study is cheaper than study in a residential high school, such broadcast correspondence education seems to be virtually as effective. However, no scientific evidence has been found which directly compares the amount of learning from the broadcast correspondence school with that from residential schools in Japan. Indeed, any such experiment would have to be designed with great care, because students whose grades are above average are much more likely to go on to residential high school. Thus a comparison of student performance in the two kinds of schools without proper controls would probably compare groups of students with very different aptitudes for high school study.

Such relevant scientific evidence as exists in Japan is very favourable in regard to the amount of learning that results from radio and television classes. Although two experiments have cast doubt on the usefulness of one television programme a week used as a supplement to class teaching[1], another experiment demonstrated rather impressively that television used over a three-month period was effective in implanting desirable social attitudes in the minds of young persons[2]. This result, of course, is the purpose of the 'Special educational activities' broadcasts in the correspondence programme. Another experiment in 1960 showed that an NHK school broadcast on social studies resulted in a significant increase in learning among grade 5 students[3]. Still another experiment employed two groups, of which one was viewing an NHK class broadcast on history and one was not. Although there were no significant differences between students in the upper 30 per cent of the two groups, the lower 30 per cent did significantly better than students of equal ability taught without television[4]. This result is

[1]) Abe, K., Analysis of the Effects of Television as a Mass Communication Medium, University of Tokyo, February 1960.
Ukawa, K., The Effects of Science Teaching through Television, Kagawa University, 1960.

[2]) UNESCO, NHK, and Ministry of Education, Television Project for Youth in Japan, NHK, 1959—60.

[3]) Ogawa, T., Learning from Educational Television, Institute for Educational Research, Nagano City, 1960.

[4]) Osaka Educational Research Institute, A Comparative Experiment on the Learning Effects of a Historical Educational Television Programme, 1960.

of interest because a large proportion of the correspondence students are thought to come from the lower half of their classes. It should be noted also that a series of experiments done by the NHK Radio-Television Culture Research Institute has shown that radio educational broadcasts are effective in teaching among other subjects, Japanese, English, and music[5].

The relevant study and one of the few using a high school population was based upon an English test given to forty students of a high school in Miyazaki Prefecture, in 1963. Of the forty students, seventeen had been listening to the NHK English broadcasts, and twenty-three had not. In the following the results of the test are indicated.

Results of English test: listeners and non-listeners

Subject matter of test items	Possible score	Average of listeners	Average of non-listeners	Difference
Pronunciation	10	7.1	5.7	1.4
Vocabulary	13	11.1	10.7	0.4
Comprehension of content	35	28.9	17.2	11.7
Sentence structure	42	24.5	15.3	9.2
Total	100	71.6	48.9	22.7

No information was furnished as to previous performance or aptitudes of the two groups, and therefore it would not be proper to place too much emphasis on the results[6]. But the general trend of these experiments in Japan, as in the United States, France, Australia and elsewhere, leaves little doubt that well-planned educational broadcasts do contribute to learning.

Unfortunately, there is no research in Japan comparing the learning that results from correspondence study with and without broadcasts. When such studies are made they will be very useful.

On a slightly different level of evidence, the officials of the correspondence school point out that the standards maintained in their assignments, their texts, and their examinations, are the same as those in the residence schools, and that the correspondence students are apparently doing as well as they would be expected to do in full-time study. No comparative grade records, with or without controls for aptitude, have been reported.

What the Students Think

Although there has been no systematic survey of students' reactions to radio and television broadcasts in connexion with correspondence study, a great many reports of their opinions come in at the annual meeting of schools co-operating with the NHK Correspondence High School. These reports contain many suggestions for making the programmes more usefull — for example, 'broadcast them more slowly', 'repeat the programme', and 'broadcast period should be longer'. One of the most frequent

[5]) NHK Radio-Television Culture Research Institute, The Effects of Radio Japanese Classroom, 1954—55.
Ibid., The Listening Effects of Radio English Classroom, 1954—55.
Ibid., The Effects of Educational Radio Music Classroom, 1956.

[6]) The results of this experiment were reported to the author by the National Institute for Educational Research, Tokyo.

complaints from students of schools other than the NHK school itself is that the pace of teaching at the school does not always correspond with the pace of the broadcast lectures.

The following table presents the results of a survey, conducted by a co-operating school in Miyagi prefecture, on the helpfulness and the difficulty of some of the broadcast lectures.

Survey results: helpfulness and difficulty of broadcast lectures (in %)

Comments	Modern Japanese	Mathematics I	English I	Geography	Physical exercise
As a supplement to study, broadcast lectures were:					
very helpful	21	72	21	20	24
helpful	60	21	43	44	38
not helpful	19	7	36	36	38
The content of broadcast lectures was:					
difficult	16	84	10	10	2
adequate	62	16	90	90	98
easy	22	0	0	0	0

More than two-thirds of the students were apparently finding the broadcasts helpful. It is noteworthy that the lectures which they judged most difficult (Mathematics) were the one considered most helpful. Teachers report that their students find Mathematics difficult to understand with the aid of textbooks and work books only; therefore students are more likely to be grateful for the additional help that broadcasts give them, even though they find the content difficult.

The NHK school made a survey of 100 of its pupils which provides some additional information on student attitudes and reactions. Of these 100 students, forty-nine were using radio, twenty-nine television, and twenty-two both radio and television. These students found classes in English somewhat more difficult than classes in Mathematics or Japanese literature, and the more difficult they found a course the more likely they were to report that the pace of the broadcast was too fast. About one out of four or five of the students reported that they sometimes fell asleep or were drowsy when trying to study, because of weariness after the day's work.

According to a recent study by NHK, the figures are rather different. Of 717 NHK high school students, 37.1 per cent were using both radio and television. When these students were asked whether they were using broadcasts for all subject matter or only some, it was reported that 57 per cent of students use broadcasts for all subject matter. It was also reported that the older students tended to use broadcasts more than the younger students. For instance, the ratio of students who use broadcasts for almost all subjects is 46.9 per cent for students under 20, 65.1 per cent for students under 30, and 71.9 per cent for the students over 30. Housewives are the ones who use it the most. It was reported in the previously cited survey, Mathematics and English are the subjects for which television is used the most. When they were asked the reason, they were likely to say, 'Because I am weak in the subject'; and 'Because their broadcasting time suits schedule'. The relationship between the subjects for which television and radio are used frequently and the reasons for that use is shown in the following chart.

Reasons	Radio					Television				
	J***	S.S	M	S	E	J	S.S	M	S	E
I am weak in the subject	4**	7	29	15	15	1	1	58	21	22
I like the subject	14	5	9	1	10	16	6	13	5	10
Broadcasting time suits my schedule	10	3	2	6	5	3	3	5	3	5
I like the teacher and the content of the broadcast	3	1	2	1	3	5	2	5	3	6
Others	10	7	8	5	16	4	—	29	9	16
No answer	—	—	—	—	—	—	1	—	—	—
Total	41	23	50	28	49	29	13	110	41	59

* The findings of the survey done in 1967.
** Each number shows the number of students who agree to the statements.
*** J = Japanese, S.S = Social Science, M = Mathematics, S = Science, E = English

Although the proportion of the students who study in preparation for the broadcast is only 8.0 per cent, 34.7 per cent of the student review the lesson after the broadcast; however, 43.4 per cent of students stated that they do not usually either prepare or review the broadcast lesson (according to the study in 1967). It is likely that the students who have to work during the day must make great efforts to prepare for the broadcast lessons which begin around 8 or 9 o'clock in the evening.

This same study gives information concerning the helpfulness of the broadcast lessons.

When those students who are using broadcasts were asked, 'Do you think that broadcast lessons are helpful to your study?', over 90 per cent found the lesson helpful.

Those who found the broadcasts helpful were further asked the degree of helpfulness. Of 596 students nearly 32 per cent of students said that the lessons are helpful in making clear points which were not clear in the textbook or workbook, 24 per cent said it stimulates their study, 21.1 per cent said it is helpful in making reports, and 14.9 per cent said it teaches how to study. From these findings it seems that the broadcasts are making an important contribution to helping the students' understanding of a subject and, also, in motivating the students to learn.

Effect of the Broadcast

No very substantial evidence is yet available on the effect of adding broadcasts to the correspondence study. Suggestive evidence, however, comes from the 1965 report of Sapporo South High School in Hokkaido, which is a co-operating school with the NHK correspondence education. This school did not test correspondence students on their accomplishment, but asked them simply whether they thought they would be able to earn credits for their study by the end of the school term. Their answers were then classified according to whether or not they were making use of the broadcasts.

The results are presented in the following.

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Students' confidence in ability to earn credit: effect of radio and television

Students	Modern Japanese language	Mathe-matics I	English A I	Biology	Geography B
Radio users:	177	143	144	91	97
Percentage expecting credit	52	36.4	45.8	60.4	44.3
Television users: (including users of both radio & television)	146	123	139	104	54
Percentage expecting credit	53.4	45.5	50.4	56.7	48.1
Non-users:	286	282	253	164	197
Percentage expecting credit	34.6	22.3	32.4	44.5	26.9

Programmed Learning as a Part of Correspondence Work

The survey of 100 students mentioned above indicates that only forty-five of the students used all of a series of six broadcasts, whereas twenty-three used none of them at all. This low radio of broadcast 'attendance', as compared with attendance at full-time schools is, of course, disturbing to the NHK school officials. Another factor which disturbs the school officials is the remoteness from the responses of students to the lessons, a well a their uncertainty as to how actively the students are studying at any time.

Therefore, the NHK school officials have thought of programmed learning as a partial solution to some of these problems. In the autumn of 1965, school officials conducted a small experiment using a linear programme on Mathematics. This experiment reflected significant differences in learning gains between experimental and control groups of forty students each; and almost all the students who used the programme reacted very favourably to it. However, the officials point out that it takes a considerable amount of time to design and produce the programmes, and that many details of administration and course organization remain to be solved. Nevertheless, programmed materials may play a large part in these courses in the future.

The Problem of Drop-Outs

Drop-outs plague every correspondence school. Correspondence study is lonely study. The students have no group motivation, no teacher to whom they have to report every day. They have no one to whom they can go quickly for a brief word of explanation or encouragement. It is easy for them to postpone assignments, and ultimately to drop out of the course.

In Japan, the number of drop-outs in full-time schools is very low. For instance, in 1964, 1,554,449 students were enrolled and after three years 1,492,713 completed the courses, leaving 3.2 per cent as drop-outs. In part-time high schools the drop-out rate is rather high. According to the 1967 figures by the Ministry of Education, close to 30 per cent of the total students enrolled four years ago dropped out. In correspondence schools, however, when the 1962 class of entrants was surveyed, it appeared that 12,362 students out of 19,199 had dropped out of the courses by the fifth year with a ratio of 64.4 per cent. This is an average drop-out rate of nearly 13 per cent per

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year. It should be borne in mind, of course, that sometimes correspondence students withdraw for a time and then return to study. Therefore the true rate is probably less important or lower.

It is this problem that the Japanese are expecting broadcasts to help solve. If broadcasts can keep the solitary correspondence students on schedule, contribute a little encouragement and motivation, supply some of the regularity which the school day affords residential students and which correspondence students so often lack, then — at least so it is hoped — more of the correspondence students may be encouraged to persevere in their work; and the drop-out rate can be substantially reduced.

According to the figures found from the survey by NHK High School in 1970, the general trend is rather encouraging. The total number of the students who have completed all the required courses and earned a high school diploma are 6961 up to the end of March, 1970. The proportion of the number of graduates to the total entrants of each academic year has been increasing gradually (17.5% of all the entrants in 1963, 21.6% in 1964, 23.8% in 1965, and 26.1% in 1966 graduated).

Although the number of students who have completed the required courses in a year period has increased, about one-third of the students who have not completed the course work have actually failed. The problem of reducing the number of students who have failed still remains to be solved.

The dimensions of the problem of avoiding drop-outs from correspondence schools may be suggested by a survey of the intellingence quotients (I.Q's) of about 30,000 high school students in Toyama prefecture. Of approximately 19,000 full-time high school students in the general course, 71 per cent had I.Q.'s over 100. Of about 6,000 part-time students, 19 per cent scored above 100. But of 5,200 correspondence students, only 9 per cent were over 100. Thus the typical correspondence student brings to his task less native ability than does the typical resident student; he finds learning more difficult in addition to being burdened with the distraction of a full-time job. Therefore, any contribution the broadcast-correspondence combination can make to motivating such a student or helping him when he encounters difficulty will be beneficial.

United States of America **Chicago TV College**

1. General Facts

Since 1956 the inhabitants of Chicago and the neighbouring communities have been provided with the possibility of participating in television courses presenting the complete curriculum of the American Junior College, and of attaining the degree of an Associate of Arts, after having passed the course examinations. The curriculum of the Junior College continues from the High School curriculum, consisting of the 13th and 14th grades, i.e. the first two years of university study within the framework of the US educational system. By virtue of its special combination of general and vocational subjects, the curriculum of the Junior College offers the students full qualifications in certain fields of occupation. Thus, the degree of an Associate of Arts is a separate and final diploma. This degree does, however, also justify a student to enrol in the third year of some universities, and enables him to apply for studying at one of the more reputed and famous universities, which have a stricter selective policy than other universities. In this way the Associate of Arts degree can serve to pave the way to higher academic qualifications and professions.

The concept underlying the TV College was to provide further education facilities to people who had been unable to attend a regular college due to exceptional family or professional conditions.

The second, very pragmatical reason underlying this project, was to remove the burden of too high a number of students from the City Colleges of Chicago (formerly known as Chicago City Junior College) by broadcasting television courses in certain subjects.

The TV College began operation by conducting an experiment lasting three years, which was intended to check the feasibility and efficiency of television teaching. The initiative to exploit public television for tasks of formal education and to launch such a project came from the faculty members and administrators of the City Colleges of Chicago. The financial basis was established by a sum of $ 600 000.— provided by the Chicago Board of Education, and a donation of $ 475 000.— from the "Fund for the Advancement of Education" of the Ford Foundation. In 1960, when the final report on this experimental period was submitted which proved the successful operation of the TV College, it was decided to set up the College as a permanent institution. Ever since then, the TV College has been an integrated component of the City Colleges of Chicago, and has had its own budget.

In operating the TV College the City Colleges of Chicago co-operate with the Chicago Educational Broadcasting Association. Station WTTW, operated by this association, broadcasts the courses on Channel 11. Whereas the programs are conceived and designed by the City Colleges of Chicago, production is a joint undertaking of both organizations. The City Colleges of Chicago and on occasion the Teachers Colleges in Chicago organize jointly guidance and counselling services for the students, the work following the television programs in the form of a correspondence course, seminars and lectures, and the conception and production of the accompanying material. Courses are given repeat broadcast by WXXW-Channel 20, a UHF station also operated by the Chicago Educational Broadcasting Association.

The TV College has a broadcast range of approximately 75 miles, which includes the whole of Chicago and some neighboring communities. A total of 7 million people live in this region. The inhabitants of this city are, in respect to their vocational activity and educational level, very heterogenic. About 50% of the population are negroes, this being an extremely high figure. Apart from the City Colleges of Chicago, which

have seven individual colleges in the Chicago urban area with a total of approximately 25 000 students per annum, there are about half a dozen other colleges and universities.

2. *The Organization*

2.1 *Current*

The City Colleges of Chicago are under the supervision of a Chancellor, who is directly responsible to the Board of Trustees of Junior College District No. 508, County of Cook and State of Illinois. TV College, the open-circuit television extension of the entire college, is an integral part of this system. The television courses are also used for teaching regular students at the 7 individual colleges whenever colleges request them. Potential students, who want to participate in the TV College, have to enroll personally at one of the seven colleges and are registered as students of these local institutions throughout the entire course of their studies. Students having already participated in more than five courses can also enroll by mail.

In principle, there are two ways of participating in the TV College programmes, and so there are accordingly two different groups of students, varying both in motivation and in time spent for studying:

a) the credit students, i.e. students wanting to reach the degree of an Associate of Arts by participating in the courses and taking the examinations, and

b) the non-credit students, i.e. students participating in the courses informally without taking any examinations.

The credit students have to pay a fee of $ 5.00 for participating in one or two courses, and $ 10.00 for taking part in three courses or more.* The non-credit students must pay a fee of $ 1.00 per course for the accompanying material. Students attending the TV College must have the High School Diploma. Students who have not completed High School can be given a special status as students, if they are 19 years of age or older. In general, the conditions for enrolment, the requirements for participating in the course, the examinations, and all other requirements which must be fulfilled by the students are the same at the TV College and throughout the seven local colleges of the City Colleges of Chicago, with the exception of the regulations underlying the participation in classroom lessons.

For the past fifteen years a Dean has been appointed for the TV College, in order to deal with the special responsibilities connected with television teaching. He is assisted by an expert in the field of education and TV research, a pedagogue, three television producers, and a small staff of assistants. He is responsible for the policy and design of the programs, for selecting and instructing the TV teachers, for registering the non-credit students and for all further activities of the TV College.

At each of the seven local colleges of the City Colleges of Chicago, at which TV students are enrolled, a member of the regular teaching staff has been appointed as television co-ordinator. He serves as a liaison officer between the respective college and the students registered at this college on the one hand, and the Dean of the TV College on the other hand. The liaison officer has the task of passing on all announcements of the Dean as to the dates of examinations, seminars, etc. to the students, and to furnish the administrative bureau of the TV College with statistical data on the number of students participating in each course, and with other important details which are of significance for the conception and design of the programs. The television co-ordinator also organizes the enrolment days, the personal meetings of TV teachers and students, and the examinations held at the respective college.

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* Students living outside the City of Chicago pay a tuition fee equal to the part of total instructional costs borne by Chicago taxpayers — about $ 75.00 per single course in 1970.

In general, the TV teachers are highly talented and qualified teachers, selected from the regular staff of the City Colleges of Chicago. Some of the television courses necessitate the co-operation of group teachers, i.e. teachers who do not teach on television, but supervise the students' work following the broadcasts, or seminars and conferences relating to the individual courses. The number of group teachers required for a certain course depends on the number of students participating and on the nature of the course, that is whether the course in question is primarily to convey a certain knowledge and conception to the students (content course), or whether it serves mainly to practise certain skills (skill course).

The English language course is an example for a course necessitating a large number of group teachers, as the students often have homework which they send in to the College, so that the teacher can grade it, make his comments, and return it. The group teacher also organizes and supervises the examinations in the various courses. Normally the examinations consist of two parts; first, homework which the student is required to do on certain subjects during the course, and which he sends in to be corrected and graded, and second a final exam in each course, consisting of a written and an oral part. The students all take this examination at the main college of the City Colleges of Chicago. The written part of the examination can be either of a subjective or objective nature. The overall grade for a course is thus extracted from the results achieved in both parts of the examination. The City Colleges do not have a final exam as, for example, in Great Britain. Every student who has successfully attended the fourteen individual courses in the compulsory subjects and six courses in the facultative subjects, which he can choose as he wishes, receives the degree of an Associate of Arts. Physically handicapped or ill students are able to take their examinations at home under the supervision of a representative of the TV College. Similarly, the inmates of reformatories or prisons participating in the TV College program can take the examinations under the supervision of the educational officer of their respective institution. Apart from organizing the examinations the group teachers are also concerned with maintaining class lists and keeping check of the rate of premature drop-outs. They also give the students help, advice and information at the conferences and during the weekly telephone counselling periods. In general, the group teachers are also chosen from the staff of the City Colleges of Chicago, so that staff members from the Chicago Teachers Colleges are only employed for supervising training courses for future teachers.

Formerly, television courses were broadcast live and recorded at the same time for later use. In the case of live programmes a substitute for the television teachers was always provided, should the first teacher fall ill, or if something else should happen. In 1969, however, live telecasts were abandoned in favour of prerecording for later broadcast. This change is making it possible for producers and teachers to improve production quality and exploit the resources of the medium.

2.2 Proposed

During the academic year 1969–70 the TV College staff have been carrying on an intensive reexamination of their institution's goals and functions. It has become clear that TV College is not making the impact on campus instructional programs that it should be, although it provides valuable services that duplicate campus programs. As indicated above, new directions are being explored. In recent years, too, federal, state, and private funding has been obtained for special productions. A variety of vocational courses is being offered. A five-year vocational education plan has been developed. Yet the need for a critical reassessment of the entire operations is pressing. TV College has now begun to enlarge its mission, even to the point of the staff's recommending that it become part of a larger organizational structure that would enable

television and other technologies to make an impact on City Colleges of Chicago instructional programs in the classroom, stimulate significant instructional innovation, encourage the individualizing of instruction, and serve off-campus groups whose interests are other than the conventionally academic.

In short, TV Coallege aspires to become a part — the nucleus, perhaps — of a Learning Resources Laboratory, a service designed to co-ordinate instructional technology and instructional resources for the entire college at a central level. The purpose: to improve learning generally, as well as insure that maximum learning is derived from scarce funds made available to support instruction.

Perhaps the best definition of instructional technology is one contained in the Report of the Commission on Instructional Technology submitted to President Nixon in Fall 1969:

> In broad definition it is a systematic way of designing, carrying out, and evaluationg the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction.

The central administration has indicated its support of such broadened objectives. As in the past fifteen years, there will continue to be a TV College offering courses to homeviewers interested in the Associate of Arts degree or university transfer. But much more attention will be paid off-campus students with special vocational interests. This may mean the utilization of distribution systems like Community Antenna Television (CATV) or 2500 megaherz systems to reach these groups at reasonable cost. A petition has been sent to the City Council of Chicago requesting that when franchises are awarded to companies to install coaxial cables for CATV programming, the contract will contain provisions requiring that operators devote 10% of channel capacity to educational broadcast and install cable connections in schools and colleges free of charge. This will mean probably two channels for instructional use at the outset.

Arrangements must be made whereby segments of TV College recorded courses can be released to campuses to supplement and enrich conventional instruction, and program retrieval systems to be used by students on an individual basis. A fully equipped laboratory — perhaps one that will serve as a regional center containing a wide range of audio-visual equipment will be developed. Most important, creative and imaginative teachers will be sought to produce the imaginative "software", without which expensive and impressive-looking hardware is meaningless.

3. *The Courses and the Policy Underlying the Programs*

The TV College offers potential participants in and around Chicago a program consisting of 25—27 broadcast hours a week — as many as 9 different courses in each of the 16-week terms of the academic year. The summer program, which lasts for eight weeks, comprises an average of 9 lessons (or four courses) a week. Normally a course is made up of 30 programs lasting 45 minutes each. Each program is re-broadcast either during the same evening or on the following day, for students who were for some reasons not able to view the first broadcast.

The curriculum consists of six groups of subjects. Each term courses in general education subjects are presented; these courses consist of sociological subjects, biology, physics, art, and English language. In the course of their studies all students aiming at the degree of an Associate of Arts have to participate in a fixed study program made up of about 14 courses in this group of subjects. Apart from these compulsory subjects,

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other groups of subjects are also offered, from which the students can compile their study of facutative subjects according to their interests and vocational aims. These studies last for about 6 courses. The facultative subjects also serve to take the desires and wishes of the non-credit students into consideration, as far as this is possible. The non-credit students are interested primarily in a general improvement of their education and of their vocational knowledge and training. Thus, these additional lessons usually consist of courses in one of the five following groups of subjects:

1. the Arts subjects — literature, history, art history, philosophy,
2. languages — one language course annualy in German, French, Spanish, or Russian,
3. vocational training subjects — book-keeping, shorthand, typing, commercial law,
4. subjects from the curriculum of teachers' training colleges — educational and child psychology, philosophy of education, sociometry, and
5. special courses in mathematics and in the scientific subjects.

The sequence of these 5 inter-related groups of facultative subjects reflects the importance and scale of these subjects within the framework of the overall program of the TV College.

A total of 89 different courses has been broadcast during the 15 years since the TV College was first opened. These courses ranged from contemporary art and American literature to algebra and linguistics. Many courses have been repeated 7 or 8 times, but most of them only two or three times.

It should be noted, however, that beginning in 1971—72 school year more attention is being given to technical courses and courses of non-academic nature.

The courses presented in each term are selected in such a way that they appeal to three different groups of students:

1. the credit students aiming at an Associate of Arts degree, in order to reach some kind of vocational target. Within the next year, this group will include students interested in the Associate in Applied Science degree;
2. students intending to continue their studies at teachers' training colleges after having completed the TV College courses. This category also includes teachers already in employment, who want to further their education and knowledge;
3. the non-credit students participating in the curriculum on a tentative basis, who are primarily interested in improving their general standard of education on the one hand, and in attaining vocational training on the other.

The special desires of the students participating in the TV College as to extra-curricular courses and lessons are determined by means of questionnaires sent out periodically. However, the flexibility of television as a teaching medium and the permanent crisis in the structure of the general school and university system lead to the participation of a number of schools and similar institutions in the TV courses, in this way hoping to reach their specific teaching aims. The TV courses are used for the classroom teaching of regular students at the seven local colleges of the City Colleges of Chicago and at certain teachers' training colleges in Chicago. In so doing two television lessons in a certain subject are supplemented by a direct lesson lasting for one hour. In principle, colleges and universities accept TV teaching as a highly important and valuable method. This method does not only permit large numbers of students to be instructed simultaneously, but also provides the students with the best teachers in every subject. Furthermore, colleges with shortages in staff and equipment can in this way offer courses with a high degree of quality, which would otherwise not be possible.

The TV courses are not only available to the City Colleges of Chicago, but also to other colleges all over the nation in the form of videotape recordings, through the Great Plains National Instructional Library, a non-profit making organisation established at the University of Nebraska in Lincoln, Nebraska. Nevertheless, teachers whose courses are made available by this library always exercise full control over the contents of their courses. Colleges using the recorded courses only have to pay a sum covering the expenses for the administrative cost connected with the copying and delivery of their videotapes. So far about 9 recordings of TV College courses have been purchased and used by other institutions. Another institution or group of students participating in the TV College is the High School or rather those High School pupils, who qualify for talent and educational promotion. After having been recommended by the principals of the respective High Schools, such pupils are allowed to register for selected TV courses during their last year of school. Apart from the fact that this regulation offers the pupils the possibility of obtaining a certain idea of what studying at a university is like the TV courses also provide them with a facility for independent further education.

Apart from improving the existing courses for the various groups of students, the TV College also plans in the coming years to give more attention to special training facilities for various professions within the framework of the overall curriculum. Programs are planned leading to an Associate of Arts degree in social work, nursing, and police training. Further courses are to prepare students for professions such as banking, the broker's business, trade, and marketing. Another project currently being discussed is concerned with the TV College offering retraining programs with courses in data processing and electronics. Furthermore, general education programs are to be developed, which will above all guide young people suffering from a social handicap in the City of Chicago to further education.

As already indicated, the proposed development of a Learning Resources Laboratory, of which TV College will be a part, will broaden the objectives and services of the instructional television operation. Production will be modular so that segments of courses can be designed for classroom use as well as for uses with homeviewers. The interest in cultivating new audiences will result in the service to pre-university homeviewers no longer remaining a prime objective.

4. *The Training of the Television Teachers and the Work Undertaken to Prepare, Develop and Conduct a Television Course*

The courses are prepared and developed by teachers and scientists of the City Colleges of Chicago. Experience shows that teaching by television is by no means inferior to conventional classroom teaching, seen from both a pedagogical and a qualitative point of view. On the contrary, the students achieve equal or greater success, if the teacher has mastered TV as a teaching medium, if he exploits all the possibilities offered by this method, and if he supplements it by other audio-visual methods, teaching aids and approaches, whenever these should be pedagogically suitable.

The actual key figure at the TV College is the teacher. The College was lucky enough to gain competent teachers for its television courses. The procedure in employing the teachers is as follows: Teachers are requested to send in their application for working on TV. Another possibility is to ask university chancellors or heads of faculties to make suggestions as to suitable teachers. Only a very small number of teachers were employed who are not regular members of the faculties of the City Colleges of Chicago. This is not supposed to be an absolutely rigid policy, but it is thought that the unity of the TV College as an institution can be maintained best in this way. Each teacher selected as a TV teacher for a certain course is initially requested to compile a program lasting for about 10 minutes on a subject he is especially interested in.

This program is recorded, and discussed and explained in detail by the respective teacher and the members of the television staff when presented. Mistakes made are pointed out to the teacher, he is given advice as to correct behaviour on TV (gestures and language), and he is shown various tricks that can be used when teaching. The next step the teacher must take is to compile a 45 minute program dealing with part of the subject matter of the planned course. In so doing he must give special attention to the mode of presentation of the material taught and to the rhythm of the lesson, in respect to the usage of audio-visual teaching methods. The teacher will not start with the actual preparation of his course until he has successfully completed this trial program and is fully acquainted with using television as a teaching medium.

Each teacher is granted a preparatory period of eight weeks for each course before the first program is recorded. His first task is to draw up a short report, in which the main teaching aims of the course are explained and discussed. This period lasting 8 weeks, devoted entirely to the conception and planning of one single course, makes it possible to formulate clearly the implicit aims of the course and to develop the mode of presentation of the material accordingly.

The teaching aims determine

1. *which mode of presentation is to be used for the television courses, and to what extent audio-visual teaching aids are to be used in presenting the material;* for example, content courses such as history, literature, and social science, are suited especially for being presented in the form of lectures, whereas skill courses such as natural science, music, art, typing, and shorthand, must employ a substantial amount of trial demonstrations and dramatizing effects in the studio, and — as can already be mentioned here — necessitate a closer contact between the teacher and the students in the form of conferences, seminars, classroom exercises, etc. and
2. *which audio-visual aids, teaching aids and procedures are to be combined with the television programs, and the intensity of this combination:* This is a problem which is to be discussed in the following. In the majority of the courses run by the TV College the students are supported in grasping and elaborating the material taught in the television programs by a comprehensive guide accompanying the courses, by a correspondence course running parallel, by programs exercise material, conferences, and telephone counselling periods. The following examples are to show which functions the individual teaching and studying methods have in realizing the teaching aim, and which theoretical and psychological concepts underlie this specific combination of television teaching with other methods of teaching and studying.

A. The Guide Accompanying the Courses

The guide accompanying the courses contains a description of the most important studying aims, additional explanations geared to each TV program, reading material, and exercises and information on the homework to be done on a certain topic and mitted at a certain date. Apart from this guide, the TV courses are elaborated in some cases by normal textbooks which are handed out to the students, and in a few cases by tapes and records placed at the students' disposal for their home studies.

The guide can only provide general information on the requirements of a course, as these books with about 60 to 70 pages are printed by commercial printing shops and given to the students each time a videotape recording of a course is re-broadcast. For this reason the credit students receive a credit bulletin every term, in addition to the guide. This bulletin informs the students of when and where conferences and examinations are to take place, of when the television teacher and the group teacher can be reached on the phone, and of which other requirements they must fulfil in order to complete a certain course.

B. The Correspondence Course

Correspondence courses are developed in a short, limited form to accompany all of the TV courses. These correspondence courses play an especially important part in courses necessitating active individual work on the part of the students. About once a week each student mails work he has done on a certain subject, or other worksheets and exercise sheets, to the television or group teacher to whom he is allocated. The television or group teacher grades the work, makes comments, gives advice as to gaps in the student's knowledge, and returns the work to the student. Should unclear points or difficulties arise on the part of the student during this postal interaction, he can clarify these at short notice at a certain time of the day by phoning his teacher.

C. Programmed Exercise Material

In addition to the students' guide, many teachers develop exercise material based on the principles of linear-programmed instruction. In general, this exercise material consists of answer sheets with the grades for self-correction already attached, or answer sheets with references as to the correct answers to be found in the students' guide. In this way the process of learning can be reinforced, as the student is able to find out immediately whether his answer was right or wrong. For some courses exercise material has been developed based on the so-called "branching" programming method. In this case the student is referred to the passages in his guide or to certain textbooks that provide him with the correct answer and the individual steps leading to the correct answer, if his solution should not be right. Examples of courses with programmed exercise material are Educational Science 256, Business Management 101, Humanities 202, Physical Science 101, and Spanish 101.

Another version of programmed teaching is constituted by the so-called plan exercises, that are given in courses in business management. In these exercises the student shows and explains the individual aspects and steps which have led him to the solution of a certain problem. These data are fed into a computer by telephone. He then receives the solution of the computer analysis by mail or telephone within a very short period of time, together with a confirmation as to whether his thoughts were correct or not, and a list of possible errors determined by the computer.

D. Conferences

So-called conferences, i.e. meetings of the students and the television teachers and/or the group teachers are held for all courses. These conferences have the purpose of repeating and elaborating certain subject matters in discussions, and are intended to discuss general problems of studying, and difficulties and frustrations encountered by the students. In courses in which the TV program and the study of the relevant literature form the nucleus, attendance of the conferences is not compulsory, whereas the students must attend the conferences in courses which are intended to drill certain skills. Therefore, the students participating in an Italian course held in the 1968 autumn term had to attend seven exercise meetings lasting about 1½ hours each. Students interested in working in a laboratory as a supplement to the regular lessons in physics, have to spend four hours on seven Saturday mornings in such a laboratory. These practical exercise meetings are held at four of the local colleges of the City Colleges of Chicago, the so-called TV Centres. These centres are located in such a way that one of them can be reached without difficulty by all students living within the town boundaries.

E. The Telephone Periods

During the telephone periods the students can discuss in brief questions relating to a specific subject with their teacher. They can also arrange appointments for meeting the teacher personally for a comprehensive discussion. The main motive behind the telephone periods is to give the student a feeling of not being isolated.

Each television teacher can be reached on the phone by the students for two hours every week. The group teachers can be phoned almost daily.

Designing the TV programmes, developing and producing the students' guide, the programmed exercise material and the correspondence courses, planning the conferences and the telephone periods and several other tasks, constitute the work and problems to be done and solved by the teacher and a small staff of assistants, prior to the broadcasting of the first program.

During the first years of operation of the TV College each television course was prepared by a team of three teachers. After one month's work in this way, one of the members of the team was selected as TV teacher. The second member of the team became substitute teacher and the third member helped the first two in preparing the broadcasts. Eventually, the idea of teamwork was abandoned in favour of one television teacher and a substitute. This expedited the procedure of making the necessary decisions and cut the expenses required for preparing the individual courses.

5. The Production of the Television Courses

The TV College has an annual contract governing the usage of studio facilities with WTTW, Channel 11. This station makes the broadcasting time available to the city of Chicago free of charge. The directors, the cameramen and the technical studio staff are also provided by WTTW. Despite this fact, the TV College staff includes three television producers, who all hold an academic position within the College. These producers co-operate with the teachers, when the lessons are developed and rehearsed.

Ever since 1966 the staff of the TV College has been employed with improving the methods of production. For many years most of the producers were satisfied with simply imitating the well prepared lectures held in regular classrooms. Although there are few or even no results available based on relevant research, which might indicate in any way that the students' performance is influenced negatively by a lack of exactness and care in the production of the programs, the TV College management is determined to do their very best to exploit the visual potential of the medium to the greatest possible extent. All the members of the staff hope to be able to deviate from the verbal mode of presentation — the "talking face" — which at present is used almost exclusively. Perhaps it will be possible to give the medium itself the status of teaching method which encourages the students to partake in mental expansion and discovery, by exploiting the skills of a technical staff with the largest possible basis of training, by using the knowledge of experts in the fields of learning psychology, and by employing the results of experiments examining the teaching intensity of visual and not verbal dimensions, as compared with the almost exclusive role of the spoken word in conventional teaching methods, so that the medium will not remain a mere system of propagation.

At present many colleges in the United States are discussing the formation of co-operatives concerned with producing TV broadcasts. If such co-operatives could be realized, television courses would be produced and financed jointly and used by all the members of a co-operative. The Public Broadcasting Law, which was passed by Congress will help to expedite this movement, as this law provides for the possibility of establishing "educational laboratories" well equipped both in respect to material and to

staff. This undertaking is to be carried out with financial aid from the Federal Government. Under TV College auspices, a consortium of junior colleges called Northern Illinois Television Association (NITA) has been formed. At present members of the association agree to accept enrolments in courses broadcast by TV College on their own campuses, with each institution supplying co-operation and awarding credit.

6. *Important Accompanying Research*

1. The Various Groups of Students

The TV College reaches groups of students, who could otherwise normally not have access to lectures of this kind. Almost three-quarters of the television students are women. About half of them are housewives. The second large individual group consists of office clerks. This rough percentage breakdown of the students applies both to the credit students and to the non-credit students.

In general, the credit students are younger. Two-thirds are in their twenties or thirties. In the case of the non-credit students only about one-third belongs to this age group. About 45% are forty or fifty years old. The standard of education of the two groups also varies. 75% of the credit students watched all the lessons in the course of their choice. In the case of the non-credit only about 40% viewed all the lessons. Nevertheless, almost 70% stated that they had viewed at least three-quarters of the lessons.

These figures make the different motivations of the two groups of students obvious. Approximately 90% of the credit students wanted to derive a direct profit from participating. In the case of the non-credit students this figure was only 50%. Almost half of the credit students stated that they wanted to become teachers.

During the fifteen years of operation of the TV College the number of credit students has more than doubled. In 1956, 2 302 credit students participated in the TV College; this figure has now risen to 4 500 students annually. During the same period the number of non-credit students has decreased somewhat. Nevertheless, the total number of students is continually rising. It is, however, obvious that the TV College has become more attractive in the course of the past 15 years.

The biggest increase in the number of students at the TV College was registered in 1961, when the TV College and the Chicago Teachers College ran courses together. By comparison, the number of students dropped in 1962 and 1963, which was caused by a change in the organization of the College: The academic year was changed from two terms of 20 weeks each to two terms lasting 16 weeks, with an 8 week summer course. In addition, no courses in vocational training were held in these two years, and there was only one course of general interest.

The initial impulse for the thousands of non-college-students enrolling annually in the TV College comes from very many different sources. Friends, who are already studying at the TV College are a frequent source of information. As, however, the TV College programs are broadcast publicly in a large city with about three million TV viewers, there is a big chance that potential students will "discover" the TV College directly, that is when switching channels on their TV set.

Intensive informatory and advertisement campaigns also help. Brochures are sent out regularly to 75 000 individuals and organizations. Moreover, a number of previews of the TV College are broadcast by the Chicago Educational Television. These previews serve to introduce the teachers of the TV courses, and inform the public of the details concerning enrolment. The public relations staff of the TV College also regularly provides the press with announcements and accompanying material dealing with the activities of the College.

2. Drop-outs and Graduates

Personal contacts between the television students and the teachers have continuously been reinforced by holding conferences at favourable days at the colleges, and by organizing telephone periods, etc. The result of these endeavours is that almost 70% of the TV College students now receive credits for the courses they have participated in, whereas in previous years only about 60% of the students reached the examination at the end of each course. By autumn 1970 a total of 270 students had completed the entire program of the City Colleges exclusively through TV courses. 180 inmates of prisons were among these 270 students. The number of students having reached the Associate of Arts degree through TV alone is relatively small, as most of the students participating in the TV College only complete part of the two-year Junior College programs through television courses — normally the first terms — and then leave to continue their studies at one of the 7 local colleges of the City Colleges of Chicago.

Among the graduates of these local colleges there is a substantial percentage of students every year who completed part of their studies at the TV College. Since 1956 approximately 2 150 students who received the dregree of an Associate of Arts at the City Colleges of Chicago completed an average of one term, i.e., four or five courses or a quarter of their entire studies, through TV. The 270 students mentioned before, who completed the entire program of the City Colleges on TV, needed an average of three to four years to finish all the courses. Most of them completed two courses less per term than the credit students at City Colleges of Chicago.

3. The Non-registered Audience

The results of TV research carried out in the Chicago area show that the TV College has a large non-registered audience. These are viewers who, while switching from one channel to another channel, come across a TV College program and watch it. The non-registered audience does, however, also include people whose attention is drawn to programs of the TV College dealing with a specific subject by announcements in newspapers.

Estimates indicate that the number of viewers watching each TV lesson ranges from 10 000 to 40 000. The surveys also showed that every term approximately 25 000 people watch the programs within the framework of one TV course fairly regularly. All in all, that means that every term some 10 courses are watched by 250 000 regular viewers and that an estimate of 500 000 people watch the TV College programs occasionally, but not regularly.

4. The Academic Achievement

Most of the students watching the TV courses at home recommend the Television College to their friends and state that they also want to participate in other courses. Students at college age watching the TV courses in lecture rooms do not have such a positive opinion of the TV College and hesitate in recommending it to other people. An important difference between these two groups is the factor of being able to select the courses of one's own choice. Home students register voluntarily for the TV College, whereas many of the students viewing the courses in lecture rooms are allocated to the TV section of a specific course, although they might have preferred the lessons with direct contact with the teacher. There are also signs indicating differences in the levels of motivation of the two groups.

When the comments of a few hundred City Colleges of Chicago graduates, who had completed part of their studies through TV courses, were evaluated, the Television College was appraised positively. The majority was of the opinion that television courses were somewhat more demanding than conventional courses. Most of

the students stated that they had learnt just as much through TV as they would have learnt in lecture rooms, and that they received approximately the same grades. A large number said that they thought the television courses were organized better than courses in conventional lecture room teaching, and that the material taught was presented more effectively.

During the first three years of operation of the TV College a systematic analysis of performance was conducted. In this analysis the academic success of the home TV students was compared with that of the regular lecture room students. The result of the first year did not show any noticeable differences. The home TV students only achieved better grades in the course for general biology. Within the framework of this analysis nine courses were compared with each other: three beginners' courses in English, two social science courses, two courses in biology, and one course each in political science and in mathematics.

In the second year of research eleven courses were compared. These were courses in book-keeping, social science, psychology, shorthand, the humanities, English, biology, and physics. In eight cases no difference in performance worth mentioning was found. In three cases the TV students achieved better results: in a year's course in the humanities, in an advanced course for biology, and a term course in physics. In the third year of research students participating in TV courses in lecture rooms were also taken into this comparative study. Six courses were selected: Social science, physics, the humanities, psychology, mathematics, and a language course. When the results achieved in the six courses by the home TV students and the lecture room TV students were compared, it became evident that the home TV students are normally more successful. In general, there is no significant difference between the results achieved by students in direct lessons and the lecture room TV students. Wherever there are differences, they are in favour of the regular teaching situation. Home TV students, however, attain even better results than regular students in almost all cases.

Although a definite comparison of TV teaching and normal lecture room teaching would necessitate a more comprehensive definition of the teaching and studying situation than was used for the present study, the following tentative conclusions can be drawn from the results of the research:

1. Television teaching is just as good as other methods — and, indeed, is often better — when applied for mature and strongly motivated students.
2. Television used in lecture rooms is not as successful. In most cases, however, students taught through lecture room TV are just as successful as students taught directly by a teacher. Should considerable differences occur, they will be in favour of conventional lecture room teaching.

After the three-year experiment mentioned had been concluded, the organization of the television courses run by the College was changed, so as to improve the attitude and performance of the lecture room TV students. TV programs lasting 45 minutes were introduced, the number of programs required for a course counting three credits was reduced from three to two programs a week, and a discussion hour took the place of the third program. This alteration led to a combination of two television programs in a lecture room and a repetition hour taking place weekly under the supervision of a teacher. In this repetition hour the material presented in the two TV lessons is treated again with the help of textbooks and study materials, and difficulties encountered by the students are discussed with the teacher.

After these changes had been made, the results achieved by the lecture room TV students quickly caught up with those of regular lecture room students or of home TV students. A comparison showed that participants in television courses run in

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lecture rooms achieved the same grades as the other groups of students in subjects such as the humanities and history. Further examination made evident that lecture room TV students who attended an additional lesson, were in general half a grade better in the TV courses than in the regular lecture room courses. The survey also showed that lecture room TV students were on an average one grade better than TV students watching the programs at home.

5. The Teachers' and Students' Attitude towards Television Teaching

The TV teachers, most of whom have many years of teaching experience, consider the television courses to be superior to traditional teaching, as the teacher has more time to meditate on the program and organize it. The teachers enjoy re-preparing the material to be taught with a new approach and modern technical facilities. On the other hand, teachers who have not yet taught on television have, in general, a negative opinion of TV teaching. They do not, however, object to TV teaching as such, but only when used for their specific subject. Thus, their scepticism towards television as a teaching medium seems to be primarily of a defensive nature, and is boosted by the fact that these teachers think their work might be endangered by the new method. In addition, they criticize the lack of personal contacts between the teacher and his students, and point out the shortage of opportunities for the teacher to hold discussions with the students. The fact that teachers who originally had a negative opinion of TV teaching changed their opinion to a positive one, when they had been informed of the mode of operation and the possibilities of television teaching, and when they became acquainted with the advantages TV offers for preparing and developing a course, shows that their attitude was partly emotional.

The majority of the television students (home students) have a positive opinion of TV teaching. Here, too, it became evident that the students' positive opinion increases according to their experience in being taught through television.

The most frequently mentioned favourable aspects of the TV College were, in inquiries answered every semester by the Chicago television students:

1. The TV teacher is prepared better for the lesson than a normal teacher, and the material taught is more comprehensive than is normally the case.
2. The teacher is able to present the material without being interrupted or disturbed, and
3. TV teaching provides people, who would otherwise not be able to study at a normal college due to certain personal conditions, with a possibility for further education.

The most common negative comments regarding the TV College were:

1. There are only few opportunities of asking questions and discussing items of interest.
2. There is no personal contact between the teacher and the students.
3. Many teachers proceed at too fast a rate in their courses, and
4. TV teaching is dull and monotonous, and it is difficult for the student to concentrate.

Lecture room TV students, on the other hand, are characterized by a primarily negative attitude towards television teaching. There are several reasons for this varying appraisal of TV teaching among the various groups of students. First, the fact that lecture room TV students are not able to choose between television courses run in a lecture room and regular direct teaching, but are allocated to TV classes for reasons of teaching economy, may partly explain their negative feeling for TV

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teaching. Second, there are various factors indicating that home TV students are characterized by greater motivation, due to their specific situation and their definite vocational aims. This might well explain the better results achieved by these students, and their positive attitude towards television teaching.

7. *Expenditure for Television Teaching*

How much does teaching through TV cost, as compared with lecture room teaching? Before discussing the expenses in detail, the various factors which must be considered when calculating the direct costs, must be broken down. These expenses are fees for public broadcasting through the studio; salaries for the teachers, the production staff and the administrative staff; expenditure for research material and audio-visual material; the costs for printing and mailing written material; transport; and expenses for extra office staff as required. These direct costs do not include fees for using library facilities; services rendered by officials; registration; heating and lighting the classrooms used by TV working groups — i.e. services rendered under normal conditions by the interested institution. These costs would only increase the total budget by a small margin — and could be met partly by income resulting from services rendered by the TV College and by fees paid by non-credit students.

By means of this breakdown of expenses the costs per television student can be calculated and compared with conventional teaching methods. In the first year of operation of the TV College (1956/57) when only four courses were broadcast and the number of credit students per course was relatively low, the expenditure of the TV College per student was considerably higher than the costs per normal student at the City Colleges of Chicago. In 1959, however, when nine courses were broadcast each term the expenses per capita dropped considerably, and in the fifth year of operation of the TV College (1960/1961), when there was an average of 800 credit students per TV course, the expenses for each student were exactly as high as for a normal student at the City College, namely approximately $ 500 a semester. During the following terms the expenses per TV student dropped below the cost per student in normal teaching, proportionally to the increase of students in the individual television courses.

Politicians and educational planners, who are considering the introduction of television in the formal educational system, should bear in mind that — as soon as the expenses for TV teaching correspond to those for normal teaching — an additional number of students can be taught through the TV College with far lower expenditure than would be incurred by conventional teaching, in which the costs increase in an almost linear proportion to the increase in the number of students. In addition, the TV College provides educational facilities to a large number of non-credit students, who have not been taken into account in the above comparison. When including the non-credit students, i.e., the students who did not participate in order to reach an academic qualification, the TV College provided in the 1969/1970 academic year 10 000 students with lessons in 20 courses costing a total of $ 800 000. (This figure does not include about 200 U. S. Air Force students who were enrolled in a videotaped data processing course in Europe.) Finally, the TV College also offers lessons to a large number of "occasional" students. Thus, investments made in the TV College do not only lead to benefits for a limited student body, as is the case with the traditional colleges, but also provide a benefit for a general public interested.

8. *Outlook*

As pointed out already in Chapter 2 of this report, the Chicago TV College now stands at the crossroads of its development. Though final decisions are yet to be reached, its transformation in the not too distant future into a Centre of Applied Educational Technology (Learning Resources Laboratory), likely to operate on a regional basis, can be

foreseen. This means that its structure, its aims and objectives will be subject to a four-fold expansion predetermined in part by the factual development of the TV College in recent years:

1. in future, programmes are no longer to cater exclusively for the Chicago urban area and its neighbouring communities, but for the entire region;
2. in parallel with the public broadcasting of television programs, additional modes of transmission (cable, recording), and educational-technological systems will be employed;
3. instruction at conventional teaching institutions will be influenced and transformed more than ever by educational technological curricula; the gap between conventional forms of direct and media teaching will be closed step by step;
4. in future, programs shall no longer aim predominantly at high school students preparing for academic studies, but increasingly at potential participants interested in part-time vocational training.

The future of the TV College looks promising. Without casting aside the achievements of the first fifteen years, its collaborators are confident that they can meet the challenge of organizational and technological innovations by the development of novel and adequate teaching programmes.

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III.

Communication Satellites and Education

A Look Into the Future

Preface

Numerous suggestions for the usage of communications satellites within the field of education and training have been developed in the course of the past five years and put forward and discussed at international conferences. It is above all the developing countries which hope for a rapid and effective improvement of their general standard of education by educational television or radio communication satellites and thus make a big step forward on their way leading to industrialisation. At present, it appears as if the Indian sub-continent will be the first region to have an educational satellite, and there are also plans applying to Africa, Indonesia, Mexico, and South America. As far as the industrialised nations are concerned, plans for an educational satellite have progressed farthest in Canada, but discussions relating to educational satellites have also been going on for quite some time already in the Soviet Union and the USA, in Japan, Australia and Western Europe.

How should this development be evaluated? What contribution to the solution of problems in the field of education and training can be made by a communications satellite? Which social, political and economical requirements must be fulfilled so that the satellite can be operated effectively? What consequences within the framework of society will arise from the usage of satellite technology in the field of education? All the technical problems linked with the usage of satellites now seem to have been solved. Now it is high noon to discuss the possibilities of application of satellites in education and the problems linked herewith. If this range of questions is not tackled and solved soon by research, we will be in danger of technology, by virtue of its dynamic power, one day dictating to the pedagogues its purpose of usage, instead of subjecting itself to the educational tasks demanded by society.

The Development of Satellite Technology

Since the technical facilities of the satellite limit its range of application, discussion on the questions raised must be confined to the various types of satellite. A publication of the United Nations "Space Research and Technology: Benefits to Developing Countries", distinguishes between three stages of development in satellite technology:

a) Point-to-point satellites

b) Distribution satellites

c) Direct broadcast satellites

There are significant differences in cost, the available technical knowhow and the social and political requirements and consequences of operation, as far as these three stages of satellite development are concerned. Some of these differences are to be depicted in the following. But first, however, a limitation: communications satellites, no matter

* This article was stimulated by a visit to the Institute of Communication Research, Stanford University (Palo Alto, USA) in spring 1969 and by an extensive exchange of views with the director of this Institute, Professor Wilbur Schramm. The presentation draws neavily on the writing of Professor Schramm.

of what technical category, are substantially subject in usage and operative effectiveness to the industrial standard of development of the country concerned and the need for education resulting herefrom. Accordingly, a television satellite must definitely play a completely different role in the developing countries, as compared with the industrialised nations. Furthermore, the degree of industrialisation of a society is linked closely with the extent of development of the conventional communications system. In turn, the ground communications network limits or enlarges the scope of application of the satellite. For these reasons, and also because the possibilities of application of satellites in the field of education and training in the developing countries have been treated extensively in the UN publication quoted above, the statements in the following apply to the industrialised nations.

The point-to-point satellite

The point-to-point satellite characterises the first phase of development in satellite technology. This type of satellite constitutes that stage of development, which we have reached at present. For quite some time point-to-point satellites have been operating in space. Examples hereof are the US Intelsat series and the Russian Molniya satellites. The special modus of application of these types is the connection between two or several points of the earth separated by great distances, between which there is a high volume of traffic in the form of telephone, telex, telegraph, radio, television, facsimile or data transmission. These satellites are relatively low in weight, i. e. they do not require extremely powerful rockets to place them in orbit, but they do have the disadvantage of low transmission power, which implicates the construction of very expensive and complicated broadcasting and reception stations. The elaborate set-up of the earth stations also leads to the necessity of the actual distribution of signals to the consumer to be handled in the traditional way, that is via the ground communication systems of the television and radio stations, and via the conventional telephone and telegraph networks. Substantial effects on telephone traffic and data transmission in commercial fields can be expected from this initial stage of development, whereas the possibilities of application of the satellite for education and training appear to be rather limited. It is conceivable that cultural and educational television and radio programmes produced by an international organisation and broadcast from a central station could reach a state of world-wide propagation via the point-to-point satellite. A further possibility would be to link up the universities of all countries and continents by the communication satellite, either for purposes of a scientific exchange of experience or of specific research projects, or in order to make lectures given by the most prominent scientists accessible to a great many students. In the case of these examples, the satellite signals would generally first pass through the national reception stations (e. g. Andover, Fucino, Goonhilly Downs, Mill Village, Pleumeur-Bodou, Raisting), from there continue on the regional television stations or university broadcasting stations via the conventional ground system and then be distributed to the consumers, i. e. the local schools and the interested public, or the students and professors. The step from the ground reception station through short wave or cable to the distribution centres makes satellite communications expensive, technically elaborate and risky. This constitutes a reason for assuming that in the first phase of satellite development the field of education and training will remain largely undealt with, with the exception of individual cultural or news programmes with educational value, that will achieve world-wide distribution by means of the satellite.

The direct broadcast satellite

There is a potential trade-off between the cost of the satellite (cost used in the broadcast sense of the word), and the cost of the facilities for transmitting and receiving the satellite signals, i. e. the greater the transmission power of the satellite and thus the

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greater the technical and financial complexity of its construction and that of the rocket putting it into orbit, the lower the expenditure for the ground reception and transmission facilities. In turn, however, lower costs for the reception facilities mean that all consumers can have such a receiver and that now the satellite signal does not have to take the technically complicated and expensive route via common carriers and redistribution stations, as it does in the case of point-to-point satellites, but that it can pass straight on to the consumer. If this concept is applied to television, it implies that regular home receivers, which would only have to be slightly altered in construction, could be used to receive programmes broadcast via satellites. Such a high power satellite is termed a "direct broadcast satellite", and characterises the third stage of satellite development. Due to the directness of signal reception, this is as well the category of satellite which features the greatest scope of application in in respect to the field of education and training.

Thus, it will be possible in this third phase of satellite development for every person living in the countries and continents inside the catchment area of such satellites to receive the educational TV programmes produced by one or several centres and broadcast by satellite, without the intermediate step of a national reception station and a redistribution station.

The special possibility of application of this type of satellite in education is constituted by the carrying out of home instruction. In this way, high-quality teaching on all levels of education from elementary school to university and from basic vocational education and further vocational training to adult education, can now also reach people living in regions in which the traditional educational system is developed only insufficiently or not at all, or people not able to attend conventional educational facilities for reasons of vocation, family, or health. The television courses coming into individual homes would be supported by correspondence courses, computer based instruction and by written accompanying material of all kinds, services also delivered to the home through the satellite, and by local school days under the supervision of teachers or professors.

Every student or pupil participating in such an educational programme has an electronic control desk at his disposal, equipped with a TV screen, keyboard and facsimile, which makes all these services possible. Everybody could, no matter where he lives, receive an education corresponding to his interests and talent. The direct broadcast satellite would thus make a decisive contribution to the democratisation of education.

In addition all those possibilities which are described in the followng section on distribution satellites apply as well to the direct broadcast satellites. No matter how utopian it may sound, the minute the satellite has reached its orbit, the depicted vision of the instructive robot for individual homes becomes a piece of reality.

The negative aspect of a direct broadcast satellite is represented by the danger that a large number of people would be exposed arbitrarily to unauthorised programmes, such as for example educational propaganda from foreign sources with directed political and economical interests. This relates to the problem of spill over, i. e. that an educational television satellite does, for example, not only cover the country by which it is financed and supervised, but also reaches beyond the immediate area hereof and thus queries national sovereignty. Viewed from a satellite, the earth is a planet and not a gathering of countries with varying ideologies and systems of society. This becomes especially obvious within the framework of this third phase of satellite development. The spill over the borders set up by mankind and over the natural barriers by signals demands a new approach of man to his environment. It compels one to transfer one's thoughts to greater units of space and thus leads to a displacement of primarily national concepts from international politics. Only very few countries are so large that the direct broadcast satellite will cover only national territory. In order

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to avoid a future propaganda war via television satellite, as we experienced after world war II with radio broadcasts, a world-wide agreement must secure the operation of the satellite before it is shot into orbit. Not until then will the benefit of this achievement of technology be able to serve in an optimal manner the educational endeavours all over the world. Each direct broadcast satellite must be regarded as part of a co-ordinated and internationally-supervised, world-wide satellite system. However, such an international agreement concerning, for example, the development and operation of a world-wide educational TV satellite system, does not appear to be possible at present, due to the ideological differences between East and West, which is especially strongly reflected in the education and training of young people.

Although the direct broadcast satellite is the most suitable instrument for solving the educational problems all over the world, its political implications render its operation during the next decades improbable. Furthermore, there is as yet no practicable technical plan for a direct broadcast satellite, and numerous competent engineers and economists agree that the many versatile technical and financial problems linked with such a project will not be solved until 1990. In this way, however, the satellite model representing the second stage of development, the distribution satellite, is focussed to the centre of discussion.

The distribution satellite

The distribution satellites represent the broad intermediate stage of the development of satellite technology described. By means of such a satellite, signals can be transmitted to numerous ground reception stations, which are too expensive for home reception, but not for community organisations. Depending on the number of subscribers, the initial cost for these reception facilities is $ 10,000, $ 5,000 or $ 1,000. This expenditure for investments is feasible for radio stations and carriers of cable systems (individual schools or school systems, universities or libraries, hospitals and medical training centres, facilities of adult education, of vocational further training and retraining, that is strategic organisations of the community). Owing to its communal orientation, this satellite is also termed "community satellite".

The communitiy satellites are lower in weight and have a lesser transmission power than is required for direct home reception. Unlike the point-to-point satellites, they are characterised by the fact that the expensive, technically-complicated, and risky detour of the satellite signal from the national reception station to the distribution station — usually regional television services or cable systems — which renders this type of satellite only partially applicable to operation in the field of education and training, is eliminated and that the signal is accordingly transmitted direct to the interested organisations, from where it is distributed further to the corresponding group of consumers. As compared with the direct broadcast satellites, on the other hand, the distribution satellite has the advantage that it can commence operation immediately. First, this is due to the fact that all problems can already be solved in a technical and economical respect — two satellites, which have been in operation in space for several months as point-to-point satellites, one of them conducting experiments for NASA, the other fulfilling military tasks, possess the transmission power of approximately 50 watts necessary for a distribution satellite. Expenditure for such a satellite is estimated to be $ 10—20 million, compared with $ 100—200 million for a direct broadcast satellite. The second argument in favour of the distribution satellite in the light of the current political situation is that the reception of the satellite signals is not universalistic, but group specific, that is controllable by the individual countries and their political bodies. In this way possible national drawbacks can be alleviated, and international conflicts can be avoided. The politically dangerous problem of the "spill over" is eliminiated.

The Possibilities of Application of Distribution Satellites in the Field of Education

What are the possibilities and chances of a satellite for educational purposes? In order to answer this question, one must first clarify the basic question: what kind of communications facility do satellites offer? Obviously they do not constitute a new medium such as books or television. They appear to be a type of telecommunication, and can therefore be compared more readily with short waves and long waves, with wave guides and laser beams. Communication satellites are in essence signal repeaters whose height enables them to provide coverage over a very large area. Every type of information transferable into electronic signals (television, telex, telephone, radio, facsimile, computer data) can be distributed. Furthermore, signals can be exchanged between a large number of points separated by great distances, without the existence of a network of mutual connections between these points. Accordinghy, the characteristic features of a satellite are:

a) *its expanded catchment area* (one-third of the earth or an area 100 times as large as that covered by a ground television station);

b) *its flexible applicability* (television, radio, telephone, facsimile, computer data);

c) *its intercommunicative character* (e. g. the possibility of linking several discussion partners at places separated by great distances by telephone or by television, when visual contact is necessary, or of linking computers for the exchange of data).

The Hughes Aircraft Corp., America's major satellite builder, calls them "switchboards in the sky". In the light of the three principal characteristics of a satellite, its applicability in education is discussed in the following.

Educational television

The main contribution which can be made by a communications satellite to the field of education is without doubt the distribution of educational television. Although teaching supported by computers or educational radio broadcasts can also be distributed via the satellite, these functions alone would not justify the high investment linked with the satellite. First, teaching supported by computers is, at present, only being experimented with a few model schools — thus, the consumer audience for computer programmes provided by satellite would be very small — whereas television and radio already have an established place in many schools. Secondly, many teachers having to decide between the alternative of using the support of either television or radio courses for their lessons, would prefer television in which sound and picture are provided. Thus, the question arises of the task which a television satellite of the distribution type could fulfil to promote education.

Twenty-four-hour non-stop broadcasting of a television programme on several channels is the first item on the list of possible services to be rendered by a TV satellite. This programme could encompass live news broadcasts and cultural events originating from all parts of the world, as well as high-quality teaching programmes for all levels of education. The programmes would be video-recorded by the respective local reception and distribution centres — television stations, carriers of cable systems, hospitals, medical centres, facilities of adult education and administration centres for further vocational training and retraining, schools and school systems, libraries and universities, television schools and television universities, large firms, professional associations, etc. — and be passed on to the consumer audience as required, or, in the case of topical live programmes, be incorporated directly into the broadcasting or training programmes of the individual organisations. The "Midwest Programme for Airborne Television Instruction" (MPATI) could well be regarded as a model for such a television programme. This set-up broadcasts educational television programmes to schools in six midwestern US states, from a plane circling at high altitude. The catchment area

of MPATI is a circle with a diameter of approximately 400 miles, and thus approaches the dimensions of the satellite situation. A satellite television project will have to cope with problems similar to those of MPATI, in respect of the execution of the programme.

For example, the courses offered by a television satellite could be made up of the following components:

Courses dedicated to pre-school education, aimed at raising the education aspirations of parents in the lower social classes for their children, at leading children, suffering from their social surroundings, to the traditional educational contents of society, and at instructing nursery school teachers in the new methods of child education.

Courses from the curricula of elementary and secondary schools, community colleges and universities. Naturally, not all the subjects treated by schools and universities could be provided on an international basis, as local cultural differences, pertaining above all to the humanities, require different emphasis and treatment of the subject matter. However, courses in science, languages and other universal subjects could be produced on a joint basis and distributed internationally. The success of the series "Modern mathematics", which was broadcast by Eurovision, supports this thesis.

Courses for the retraining of semi-skilled and unskilled workers. Courses for further training of teachers, doctors and other professional people. Courses for general adult education.

Programmes serving to present and interpret the latest results of research work conducted in the fields of science, social science and the humanities.

Special live television programmes on events taking place all over the world, which are of special interest for pupils and students.

The cultural segment, by comparison, could be made up of the following programmes:

Programmes on musical and literary events of great significance, and performances of famous theatres in Europe and overseas.

Programmes presenting both the works of old masters and those of promising young artists.

Programmes on special cultural events, such as the first opening of the Munich opera, premiers of important symphonic works and performances at regional theatres, to name but a few.

Series on the cultural life of the European peoples and of peoples living in other parts of the world.

Series dealing with the history of Europe and the most important European organisations.

High-quality and well-assorted programmes for the instructive entertainment of children.

Among others, the following programmes should be presented within the framework of news coverage:

Comprehensive live reports on significant political discussions.

An interpretation of and commentary on news from all over the world.

Interviews and discussions with outstanding political, economical and cultural personalities.

Documentation and presentation programmes, leading to a critical appraisal of important international, national, regional and local problems in the European countries.

Live broadcasts and filmed reports on life in the countries of Europe and of the world, aiming at stimulating a better mutual understanding of the peoples and at eliminating prejudices.

Programmes on national and local political campaigns in the various European countries, including broadcasting time furnished to the candidates contesting for political mandates — subject to suitable supervision – in order to stimulate better appreciation of the democratical process and the democratical institutions in the various states.

Programmes conveying knowledge and skills helping the individual to master day-to-day life, and also conveying social techniques (e. g. how to make decisions, how to get along with other people).

In 1966, the Ford Foundation developed and submitted to the public a television programme for a US educational television satellite similar in intention and structure to the one described above.

Which effects and which substantial improvements of educational work in the traditional centres of education could be brought about by a satellite television programme conceived in such a way? Let me try to clarify this question in the following by presenting some remarks and examples. The quality of school and university education would be improved considerably by the introduction of course programmes — developed by specialists in the various special subjects, and produced with the assistance of the most modern production techniques — into the traditional curricula of these schools and universities. The scope of teaching available at schools and universities could be considerably raised in quality and enlarged in content. In addition, a temporal shortage of teachers could be counteracted with the help of such instructional programmes. Eventually they could, having processed the contents of the latest knowledge in a subject and being able to present this knowledge in the light of the most modern pedagogical aspects, make a contribution of the training of new teachers and, in this way, to a renewal of the educational systems.

The free offer of instructional programmes for schools and universities, for adult education and further vocational training, could well stimulate the foundation of television colleges and universities (as far as these do not exist already) in the individual countries. These facilities, the course curriculum of which could be made up mainly of satellite programmes, would be supported by correspondence courses and periodical discussion evenings on a local basis under the supervision of teachers, and would provide such people with high-quality lessons, who either live in regions where the traditional educational system is poorly developed or cannot attend conventional educational institutes for vocational, family, or health reasons. Thus, a substantial contribution could be made to the equality of the educational possibilities in the various countries, and in this way to the democratisation of the educational system.

The provincial character of education in the respective nations could be eliminated by the live broadcast news and cultural programmes offered. Via the satellite, events taking place in all parts of the world could almost immediately be made available to the schools and the universities and be incorporated into the teaching curricula. Pupils and students, even if living in the most isolated regions, would be enabled to watch important events taking place at any place of the globe directly when they occur, regardless whether a debate in the British parliament, student riots in Berlin, or the election of the French president.

The news and cultural component of the curriculum broadcast by the television satellite would doubtless be suited to make a large contribution to the teaching of the social sciences. The limited experience of the individual makes it impossible for him to become acquainted with and understand the way of life and the behaviour and viewpoints resulting herefrom, of foreign peoples. Prejudices and incorrect action often are a result of this lack of knowledge and appreciation. It is well conceivable that the scientifc documentation and reports on people and societies in all parts of the world, which are conveyed to the schools and universities by the satellite, will not only enrich

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studies in social science but will also make the peoples better acquainted with one another and help in this way to reduce prejudices and conflicts. In this way, a great contribution to international understanding could be made.

The training of development aid personnel sent by European countries to Africa, Asia and South America could also profit from television by satellite. Introduction to the problems of the respective countries, to which the aid personnel are sent, and the adjustment of their behaviour to the people of the environs where they will be working, could be conducted with the help of television documentation and live programmes broadcast via satellite. Although training in the developing countries could not be rendered unnecessary by this system, the analysis of these reports on the individual countries could enrich the initial stage of training considerably.

Furthermore, language courses suffer chronically from isolation from the peoples who speak the languages being learnt, and also from the impossibility of getting to know the culture and way of life of the people in question. The news broadcasts and cultural events from other countries, transmitted in the language of their origin via the television satellite, could when incorporated into language teaching make the lessons more stimulating and could boost their function, as well as depicting clearly the actual reason for studying a language.

So much in relation to some of the effects, which could be expected of a television programme broadcast by one or several centres and distributed via satellite. However, the intercommunicative element of the television satellite also provides for the possibility of a number of other services, which are dealt with in the following.

The term "intercommunicative element" refers to the quality of the satellite, to link up two or serval points separated by great distances and in this way to enable a mutual exchange of information. By means of the television satellite, all the television stations in Europe, for example, all the carriers of cable systems, and all CCTV facilities could be linked up and thus:

a) Conduct an exchange of programmes rapidly and on an economical basis, with the chance of improving the quality of the regional television programmes. With the intercommunications system supplied by satellite, it is planned to replace, for example, the short-wave linkage system between the individual television stations in the USA and Eurovision programmes could also be broadcast more effectively and with fewer problems by satellite; and

b) Provide access to "real time" programming i. e. to guarantee live broadcast of occurences taking place all over the world. Within the framework of public television service, financial considerations in programme production have limited live transmissions to a minimum. Tapes, however, have led to television losing a good deal of its original liveliness and its feeling of being on the spot — which constitute its actual qualities. Live programmes, by comparison, activate a person's intellect and fantasy; he has the feeling that he is presented where things are happening. Satellite transmissions would once again make live programmes economically feasible, even if conducted by regional television stations.

A further possibility of exploiting the projected intercommunication network via satellites is constituted by an exchange of lectures between universities. In this way, the knowledge and thoughts of the world's greatest scientists could be made accessible to many hundreds of thousands of students.

Apart from vitalising the conventional communication market, the television satellite could also open up the way to completely new possibilities of communication. Anybody working in science knows that teamwork and a world-wide exchange of material form an essential prerequisite of modern research work. Among other things, the need for an intensive exchange of material is expressed by the constantly increasing number

of international conferences and seminars. The participants in such meetings often travel hundreds of miles in order to attend. Thus, as important and as necessary as these meetings may be, they also are just as costly in terms of time. In this way it is by no means unusual that a two-day conference session is opposed by two days of travelling, which are spent both in a plane or a train, and at airports and railway stations. A Multiple Access Video Service (MAVS) via satellite could contribute to guaranteeing a greater economy of time in the case of such an exchange of experience.

By means of MAVS, the TV studies of universities in various countries could be connected at short notice, enabling several scientists separated by hundreds of miles to exchange experience and discuss problems with visual contact. This network of exchange facilities could be extended as desired with the help of portable studio installations. The quality of the situation of such television discussions and conferences would be extremely realistic by virtue of the utilisation of large-screen TV sets and high fidelity audio broadcasting and would therefore be almost identical with a conventional meeting or, in other words, would be next to being there! Communicate and not communicate would be the slogan of this era. Further possibilities of applying the MAVS are the observation of experiments and the checking of the results of research work, without the observers or examiners having to be physically present.

Laboratories and research facilities are expensive installations. Via television satellite, however, it would be possible for universities not having such installations at their disposal to share them with other universities or industrial enterprises. The same applies to medical apparatus. Moreover, the value of experiencing directly medical operations carried out by famous professors could be made available by television satellite to many other people engaged in research or studies at universities situated far away from the actual place of the event. Contrary hereto, it is also possible that operations are led and directed by a specialist, who is in reality thousands of miles away from the place of action.

International education constitutes a further field which could profit from this possibility provided by the satellite. The need for an exchange of experience in the field of pedagogics, and for a knowledge of the teaching and learning practices of other countries, has increased greatly in recent years. Every teacher accepting a position in a foreign country must, under all circumstances, first become well-acquainted with the foreign school system and the history of its development. On the other hand, making one's own pedagogical work available could serve to render valuable help to other countries. The best modus of exchanging experience and methods in this way would be via satellite.

The fact that all these examples are by no means unfounded, but are situated rather within the scope of possible development, is shown by an experiment conducted in 1965. On 31 May of that year, a class at the High School in West Bend (Wisconsin) was linked up with a class at the Henri IV Lycée via satellite (Early Bird), and with the assistance of ORTF in Paris and the WHA-TV station at the University of Wisconsin. During this television broadcast, the American pupils addressed their friends in Paris in French, and the French pupils replied in English. The conversation topics ranged from the curricula of the schools all the way to the Beatles. This broadcast is not of so great importance due to its content, but due to its set-up. Viewed from the standpoint of education, nothing significant took place in the course of this one-hour conversation, but the fact that two schools were linked up by the communications satellite in order to pursue a frank exchange of ideas, is of profound significance for all those pedagogues who are concerned, in our present-day world, both with the process of becoming acquainted with foreign cultures, and with an internationalisation of education.

Audio-communication

Radio, as an instrument for education and training, is often forgotten in view of the fascination exercised by television. A large number of the tasks and possibilities discussed in relation to satellite television in the preceding section of this report could also be fulfilled by educational radio services broadcast via satellite, at a considerable reduction of expenditure (one TV channel corresponds to approximately 200 radio channels). Within this scope, the humanities and some subjects of political science come to mind above all other fields, as the contents and problems hereof do not require any visualisation and demonstration. It must, however, be borne in mind that the attractiveness of radio lags far behind that of television. Therefore, it may be feared that many teachers would not make use of the radio courses offered, and that in classes in which radio courses are employed the learning achievement is not as great as in television courses, as the power of motivation and the ability to induce perseverence in learning are greater in the case of the audio-visual medium. It is possible that the cost advantages featured by radio in comparison with television are forfeited for this reason.

Accordingly, the scope of operation of radio courses is limited to those fields of education which, as already mentioned, do not require demonstration, and in which motivation of the students is no problem; such as for example further professional training in many academic occupations, such as law, business analysis, philology, etc.

A second range of problems, for which the satellite presents itself as a possible solution, is to establish a link between the individual educational radio stations and to provide for an uncomplicated and inexpensive exchange of programmes.

The possibility of conducting by telephone conferences and discussions between scientists and teachers residing in various parts of one country or in several countries is a third sub-field of audio-communication which would profit from a satellite. Due to the substantial expenses, multiple access audio service, which can already nowadays be arranged with conventional means, is only used relatively seldom. Directed via satellite, telephone calls to other countries and even to other continents would be no more expensive than from the suburbs of a town to the town centre. This is not only due to the fact that the satellite has a much larger capacity than the conventional telephone cables, but above all because the distances covered by the call, no matter whether from a suburb of Munich to the centre of Munich via satellite, or from Munich to New York via satellite, are the same. The equidistance, however, eliminates the traditional method of charging phone calls by the distance. This fact has in turn, together with the large capacity of telephone channels featured by satellites, given rise to the prediction that at a time in the future not too far off today, a phone call to any place in the world will not cost more than 10 cents. Such a development would in a substantial way provide an advantage for the field of education with its great need of exchange of experience and opinions. Multi-access audio service would thus become a fixed component of the administration of science and, in a similar way to the multiple access video service, render time-consuming journeys to conferences lasting only one or two days unnecessary.

Utilisation of computers and exchange of data

In recent years, the immense possibilities of computers and of computer technology have been made evident for the field of education by numerous experiments and studies. The results of these studies allow the conclusion that computers will, in future, play a strategic role within the field of education. The marked trend towards individualised instruction at schools, the great need for the exchange and processing of data in science and research and the organisation and administration of the educa-

tional facilities themselves, which are continually becoming more complicated, are seemingly cogently leading us to the use of computer technology in the field of education. These requirements are already clear to-day, and the traditional procedures required to meet them are so insufficient that the utilisation of computers would be justified. Despite this fact, computers have so far been made use of only rarely in the field of education. The reason for this is clear: computers are extremely expensive apparatuses which are thus available only to a few schools and universities subsidised by the state or promoted by private foundations. This is where the satellite can make its contribution to the utilisation of computer technology in the field of education. The satellite would make computer facilities available to all schools. In this way, high-quality lessons assisted by or based on computers could be distributed via satellite from a computer centre to schools separated by great distances. Both of these facilities, namely a European computer centre for educational purposes and the satellite link between this centre and the schools throughout Europe are still hypothetical, but they might be available with what is essentially "current state of the art" technology. Computer programmes are by all means conceivable for all subjects of elementary and secondary school education. First, however, promotional courses in the basic subjects taught at elementary schools and grammar schools for handicapped pupils and late boomers should be developed and distributed. This should be done not only because there is a great need herefor, but also because these neuralgic points of the traditional school system allow the demonstration of the capability of the computer for individualised instruction most effectively. In this way teaching with computers could be introduced at schools, without the organisation and pedogogics having to be altered basically from one moment to the next, as would undoubtedly be the case if concentrated use of computers within the regular teaching system were made. The advantage for society, which could be provided by the distribution of computer teaching via satellite, would be a reduction of per capita expenditure induced by the economy of large numbers and the optimal modus of usage of the expensive capacities, and thus the possibility resulting herefrom of making computer teaching methods available to all schools. Computer instruction for all in turn would imply that, in a similar manner to satellite television, the quality of education would be improved and a further step would be made towards the equality of educational opportunity, which at present differs greatly from region to region.

As long as there is no computer centre, computer instruction could be carried out by the computer capacities in government and commerce, which are not exploited to the full extent. Hughes Aircraft Corporation has calculated that computer capacities amounting to more than $ 2,000 million are forfeited without exploitation every year in the USA alone and advises that these capacities should be exploited via satellite connections. Accordingly, computer instruction could be conducted at schools in California by utilising computer facilities at banks in New York, which have already closed for the day. In a similar way, unused computer facilities could be exploited between Europe and Japan within the framework of a world-wide satellite system.

Naturally, not all types of computers used in commerce and public administration are suited for usage for teaching purposes, but these other types could well render valuable services and work promoting the organisation of schools, school systems and universities, such as for example the compilation of timetables, catalogue work in libraries and the evaluation of the test results of pupils and students.

Finally, the computers of the universities and of the research institutes of hospitals and documentation centres could be linked up with one another by satellite and exchange information. At present, the establishment of comprehensive data banks is being worked on all over the world, which would store the entire scope of knowledge in various fields. For example, the American Medical Association is planning

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to feed all medical knowledge into a super-computer, and to make this knowledge available to all doctors at the American clinics by means of a telephone call system.

However, this computer will not only assume the function of a source of knowledge, thanks to its qualities in data processing, but will also be able to aid the doctors in their diagnosis of an illness, and the therapy applicable. When the computer is fed with the symptoms of a patient's illness, it will process these symptoms, make a diagnosis, and give detailed therapeutical instructions. Via satellite, access by the American doctors to the services in question would be facilitated and rendered less expensive, and, in addition, this expensive data bank could be made available for the work done by the doctors in clinics in Europe, Africa, and Asia.

If we assume, that one day the entire knowledge possessed by mankind will be stored in computers, this knowledge could be made available via satellite to every scientist, regardless of whether he is occupied at the Sorbonne in Paris, or at a small university in Madagascar. Even if this dream has no chance of being realised in the near future, the possibility of access of all Europe or the whole world to the data banks that exist at present would effectively influence science and research. In this way, a higher degree of effectivity of science and research would be secured, by virtue of a scientist's knowledge in his own special field of the activities and results of work done by his colleagues at other research centres all over the world. The endless duplication of research efforts would come to an end, and the process of research would work more cumulatively and therefore more effectively than before. The limited financial means would be exploited in a better way.

In addition, critical decisions in all fields of society could be made more rapidly, and reliably, as they would be footed on more comprehensive information.

The direct and personal exchange of experience via multi-access video service would, on data level, be supplemented by a second exchange system, i. e. the "talk" from one computer to the other.

Facsimile transmission

This segment of the communications market encompasses the distribution and exchange of all kinds of written announcements and printed material. Installations such as telex, TWX, and teleprinting are used to distribute printed material at a rapid rate, and the teleprinting method can even serve to transmit pictures and graphical illustrations. At present, these services are furnished by the ground communication networks. A distribution network for documents, reaching the consumer via satellite, could by-pass the intricate and expensive links of the conventional communications networks, which in turn would mean that these services could be rendered at a lower price and would accordingly be available to a far greater number of organisations, and not only to commercial consumer organisations. Such services, made possible for all organisations within the educational system by virtue of satellites, could in an efficient way supplement the educational TV programmes at schools and universities.

The written material accompanying the television courses could be printed by high-capacity presses at the reception centres, and then be copied and finally distributed among the teachers and pupils, and the students and professors.

A further possibility would be to circulate a daily newspaper featuring important news announcements and commentaries reports and interviews from politics, economy and culture, at the universities and schools. This paper would be compiled and distributed via satellite by an editorial team, made up of international experts and located at a keypoint of the world-wide communications system.

In addition, the inter-communicative element of the satellite places the focus on telecorrespondence. Subscribers to such a communications network would have devices at their disposal similar to a typewriter with a dial. When a letter is typed on this device, it appears simultaneously on the device of the correspondence partner dialled. This possibility would provide a great benefit to scientific correspondence. Moreover, the schools could be tied up more closely with the school planning authorities and the ministry of education. It must, however, be noted that a large number of subscribers is required to make telecorrespondence feasible in an economic respect. But if the number of subscribers is sufficient, it is conceivable, according to statements made by experts, that by 1975 a letter of 600 words in length will cost 33 cents and 10 cents in the years thereafter. This in turn means that the entire range of correspondence sent by air-mail would be suited for this modus of conveyance.

One final possibility of application, which should be listed in this connection, is teleprinting of books and articles. Such service could be conceived as follows: once the student or professor has localised via satellite the literature he needs for his work in the catalogues or central libraries, he merely puts through a call to the respective library for the books and articles in question. This literature is then printed on his telewriter by means of the teleprinting process at rate of 1/10 second per page, i. e. a paperback is printed in full in 30 seconds. In this way, universities and schools situated at isolated places could resort to libraries just as good as those of universities and schools situated in large towns. Similarly, publishing houses would in this way be able to distribute their latest publications among all libraries extremely quickly.

Accordingly, research and education would, in the catchment area of the satellite, be reinforced in a threefold manner: first by audio-visual aids, teaching forms and possibilities of exchange, second by the contribution made to teaching by the performance and storage capacities of computers, and third by printed material and photographs from documentation centres and libraries.

Problems encountered with educational satellites

In the preceding section, some of the possibilities of applying an educational satellite were discussed. It was attempted to make evident that the satellite is not a new medium like books and television, but merely a facility serving to transport television and radio, or computer performance and written material. Via satellite, these services can be rendered more rapidly and less expensively to a larger audience of consumers. Thus, the educational satellite is primarily an instrument of the educational logistics.

A large segment of the future need for communication in the field of education is constituted essentially by the mere expansion of existing services or the introduction of new services for which the conventional communications system is actually suited. However, viewed as a total, this projected need for communication assumes such a large scope that new communications facilities must be provided for. It may be assumed that in the course of the last third of the 20th century the substantial need for new means of communication bridging great distances will, purely for reasons of economy, be met with the help of satellite technology.

Apart from its importance as a logistical instrument, the satellite also enables other services to be rendered, for which it is, in fact, the only existing solution. This applies when innumerable points of the earth dotted over a great area, which are beyond the physical or economical possibilities of the conventional communications systems, are to be reached and connected. It has been shown which consequences and chances can be derived from these two aspects of satellites, the logistical aspect and the problem-solving aspect, in relation to the communications needs existing within the field of education. Now some of the difficulties connected with the usage of

satellites in the field of education are to be discussed. It may be that the potential possibilities of educational satellites are overestimated in general, but it is on the other hand certain that the problems encountered by satellites used for educational purposes are greatly underestimated.

Economic considerations

As has already been stressed repeatedly, satellites are extremely expensive instruments. Thus, usage of satellites for any kind of minor service is not feasible. In other words, satellites employed in the field of education will always be an instrument of mass telecommunication (mass in the meaning of a large number). A study comparing the satellite with conventional communications systems arrived at the same result. Within the framework of this comparison, instructional films proved to be the best and most economic solution for teaching small and widely-dispersed groups of pupils or students in countries or regions which have rapid and inexpensive mail and freight facilities. The common shortwave and cable systems can effectively serve urban areas, but are too expensive when it is necessary to reach dotted groups of consumers. Television systems, which, in a similar way to MPATI, transmit their programmes from an airplane circling at a height of twelve miles, can effectively cover an area populated by 1 to 10 million people and with a dimension of up to 200,000 square miles. Finally, the educational television satellite is best suited for supplying a television audience of five million people or more with programmes, under assumption of average population density. Expenditure per pupil or student is, in the case of educational television transmitted via satellite, rated at one dollar per annum and capita, and is therefore much lower in comparison with the cost incurred by conventional educational TV. However, if the audience drops considerably below the five million mark, the cost per pupil and student is very much higher than in the case of traditional educational television.

Political drawbacks

The consequence of these reflections on profitability is to the effect that, in the case of Europe, for example, the best possible modus of utilisation of the satellite involves the joining of several countries. This, however, in turn induces substantial political and legal problems. What should an educational curriculum, broadcast by a distribution satellite, be like when intended for nations with varying ideology, forms of government, and degrees of industrialisation? Things which represent education in one country may possibly be considered as propaganda in another country. Even countries with similar structures of society and economy are extremely sensitive in respect to the influx of foreign material and information into the national system of education. Thus, before a satellite is put into orbit, an international supervisory body must be established, which has the function of supervising the policy and design of the broadcast programme.

It has often been suggested that national distrust could be reduced by splitting the broadcasting period of a satellite and allocating certain channels to each country. Then, the individual countries would be able to feed programmes geared to their own educational aims into their national educational system, originating from national broadcasting stations and transmitted via satellite. By means of signal restriction the other countries participating in the satellite would be in the "shadow" of these programmes. However, such fragmentation would eliminate a great many of the economical advantages offered by the satellite. The larger the audience viewing a television course, the greater the energy and funds which can be invested for production, and thus the greater the probability that the educational programme will

reach a high standard of quality. In addition, the said fragmentation would once and for all do away with the dream of joint contents in education and training, enacting greater proximity of the peoples.

A further plan, which through breaking-up the broadcasting capacity of the distribution satellite of a community of nations according to national aspects, in order to remove national prejudice, does without the signal restriction as is employed in the foregoing suggestion. This in turn means that every member country of the satellite community would be exposed to the educational programmes broadcast by all other nations. The disadvantages of this plan would be constituted firstly by the fact that although an equalisation of educational contents and accordingly, an integration of the countries, could be effected, the danger of one-sided educational propaganda is not eliminated, and that, secondly, the cost of the programmes would be higher at lower quality, as also applies in the first case. This is due to the decentralisation of the programme origination and of production.

As it seems, the political problems could be solved only by the establishment of a supra-national production, co-ordination and transmission centre for educational satellites. An organisation which — being void of national interests — could develop a curriculum dedicated to the cause of education and designed according to the needs of a future-orientated society.

A further problem which needs to be clarified before the satellite commences operation, is that of the new arrangement of frequencies, so that the satellite does not clash with the conventional telephone, radio, and television systems and that vice versa, these systems do not interfere with the operation of the satellites. These technical problems should be given priority at the next World Broadcasting Conference scheduled for 1971.

The political questions which would be raised by a European satellite functioning along the lines of the distribution system would thus be primarily of internal European nature. By means of the ground telecommunications systems, all undesired information originating from other satellite communities could be filtered out. However, this situation will be changed from one moment to the next as soon as satellites of the third stage of development are put into orbit. Parallel to the advent of direct reception of signals, the problem of satellite supervision and the reflections on curricula will have to assume world-wide dimensions. Then, a world-wide agreement on the operation of satellites and the usage thereof will become an urgent requirement.

Educational problems

The fact that the satellite is an instrument of mass telecommunications, which has a huge catchment area, does not only have economical and political consequences, but also results in general problems of education.

It induces a conflict between the size of the catchment area and the local character of education as such. The great advantage provided by a satellite is, as has already been mentioned, the fact that it would render it possible to make highest quality teaching accessible to a larger consumer audience than can be reached by any other communications carrier available at present. However, education is determined substantially by local conditions. In this way there are in one country — within the framework of general regulations — significant differences in the organisation of timetables, the compilation of the curriculum in the specific teaching contents of individual subjects, the teaching methods, and the degree of academic achievement required. Such differences occur from one school to the next, and between one university and the other. In their structure and function, both schools and universities are affected by the existing socio-economic conditions, i. e. the economy, policy, religion, history, and customs of the area in which they are situated. Similar circum-

stances apply to other branches of education, such as adult education, and programmes for further vocational training and retraining. Education is closely linked with the other local sub-systems of a society, and adapted to the requirements hereof.

The extent to which these local influences, which affect the schools and universities in their structure and tasks, will become applicable, will also depend partly on the general political organisation principle of the educational system in a society. For example, in the USA, where the competences for education are held almost exclusively by the communities, the differences will certainly have a greater effect that in the Federal Republic of Germany, the educational system of which is organised on a regional basis. In countries such as France, by comparison, which have a strongly centralised educational system, local influences will be least noticeable.

Thus, before a country or a group of countries can start operating an educational satellite, it should first be examined, within the framework of a comparative analysis of the educational systems in question, which components of instruction can effectively be shared together. Subjects, which are suited for international transmission are above all, as already mentioned, languages, mathematics, science and medicine. If, however, the results of this comparative analysis indicate that there are only few similarities, and that the educational structures differ too greatly from region to region within one country or from one country to the next, it is preferable for the carriers of education situated in the individual areas to be supplied, for example, with television and computer lessons furnished by regional centres, rather than through an international satellite.

MPATI could well be regarded as a model case for joint usage of an educational satellite. The MPATI project provided hundreds of independent school systems in six different midwest states with teaching material. Despite the fact that it met with many problems, this project demonstrated that school systems situated in a large region can successfully develop and share a curriculum. Although it must be assumed that the difficulties in developing a teaching programme for one entire nation or even for a group of nations with varying cultures, curricula, and languages will increase greatly, it is proven by MPATI that these problems can be overcome.

It should be mentioned here that the language problem is only of minor importance. Synchronisation, the commentary method, and the subtitles procedure have already been used successfully for a long time by the motion picture industry in overcoming the language barrier. These methods have been universally accepted by the public. The communications satellites of the future will broadcast in several languages, and it will be possible for every viewer to watch every programme in the original language and the synchronised versions. In the case of live news and cultural television broadcasts, subtitles or commentaries in several languages will be chosen as the best method.

If finally the comparative analysis of the regional educational structures of a country and/or the comparison of the educational systems of a group of nations have determined a sufficient number of identical factors in the structure and interests, and if usage of satellites is therefore justified, another group of problems comes to light.

Via the educational satellite, television courses, programmed instruction, and written accompanying material instantaneously become available to numerous schools and universities within the framework of several special subjects. However, this teaching offer cannot simply be added to the traditional courses provided in these subjects and is not suited simply to replace these courses, but must be combined with other forms of teaching, in order to be effective. The teacher has the task of preparing the pupils and students for the television broadcasts or the instructional programmes, and

of referring to and clarifying unanswered questions in the subsequent discussion. He must organise additional exercises and demonstrations, and learning experiences and study activities adapted to the individual student, in order to supplement and support in a learning-psychological manner the teaching material originating from outside of the school or university. The extra-school or extra-university teaching material must become part of an integrated teaching and learning system. This, however, decisively changes the traditional role of the teacher, the teaching method, and the curriculum. The teacher becomes an educational planner who systematically allocates the available resources – instructive television, programmed learning, books, and other teaching forms – to certain teaching aims and the varying needs of the students. Within the learning process itself, his role as a dispenser of knowledge will constantly grow less significant, whereas his function as a discussion chairman and a solver of problems will continuously increase in importance. The discussion element will become dominating in the relationship between teacher and pupil, professor and student. The stimuli for the discussions will nevertheless be the material and problems conveyed in the course of television and computer instruction. The teacher or professor will therefore not be replaced by the television medium or the computer, as has often been claimed, but assumes a far more strategic and responsible task than ever before. The intellectual and training requirements made of the teacher will increase, but viewed with regard to the timeliness of his work, it will undoubtely be alleviated thanks to television and computer instruction.

This is a task which the teachers can only fulfil satisfactorily provided they are prepared for their function intensively within the framework of a comprehensive training programme incorporating regular work and planning meetings; if they have at their disposal both detailed auxiliary material of all kinds and manuals; and provided there is constant contact and continual co-ordination between the specialists compiling at a central office the instruction programmes and the television courses for broadcasting, and the teachers at the schools and universities, who prepare the pupils and students for this material and conduct the subsequent work.

However, the advent of television and computer teaching will not only result in changes of the curriculum of schools and universities, and of the role of the teachers and their teaching methods, but will also include general consequences for the organisation and even the architectural design of schools and universities. It is not intended in this report to go into detail in this matter. It should, however, be pointed out that the television and computer instruction in order to be effective requires a dramatic change in structure and function of the schools and universities concerned, and that the required changes and adaption necessitate great organisatory and training efforts. This is a comprehensive undertaking for a single educational system. The difficulties encountered herein will, however, increase by a great margin, if, through the operation of an international satellite, this change is introduced simultaneously at hundreds of schools and universities in several countries.

Let us summarise: the basic fact to be drawn from the foregoing is that the usage of satellites for education is not a technical question, but primarily a social problem. The instruments of technology are so fascinating and their development has been watched with so much amazement that it has been neglected to meditate on their usability and the problems linked herewith and resulting herefrom. If satellites are really to make a world-wide contribution to alleviating the acute crisis of education, the next step taken must be concerned with the planning and preparation of their operation. This undertaking is, in its scope and dimensions, comparable to the efforts invested in the technological aspect.

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