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ABSTRACT

The educational implications and capabilities of Broadcast Videotex, Interactive Videotex, and cable television need to be considered in the context of how education as a profession should react toward the implementation of the "new media." Broadcast Videotex, which is capable of programmed learning as well as subtitling for the hearing impaired or foreign student, differs from Interactive Videotex, which enables a recipient to receive direct access to a wide variety of education-related contents and services through telephone linkage to a central computer. Field experiments suggest that Videotex will play a supplementary function in education as a source of reference, a learning aid, and a remedial reading tool. It is an individual medium, not very apt for group learning, but it will have implications for personal and family life. With one-way cable television, individual and group-oriented special programs become possible, while two-way cable provides services similar to Interactive Videotex, in addition to films and audiovisual learning. Currently in West Germany four pilot projects are planned for testing possible uses of cable television. However, surveys reveal that both educators and students are skeptical about the use of electronic technology, fearing negative effects on society and the possible threat to personal communication and human interaction. The solution is for educators to engage in the formulation of regulations rather than leaving policy decisions to industry and politics. (LH)

EXPERIENCES WITH VIDEOTEX AND EXPECTED EFFECTS OF CABLE TV ON EDUCATION IN WEST GERMANY

BY

Ludwig J. Issing

Paper presented at the Annual Meeting of the Social Science Education Consortium (20th, Athens, GA, June 8-11, 1983).

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EXPERIENCES WITH VIDEOTEX AND EXPECTED EFFECTS OF CABLE TV ON EDUCATION IN WEST-GERMANY

In the Federal Republic of Germany there have been public discussions on the so-called New Media since 1976. The reason for this is a report of a government commission on the development of telecommunication systems in Germany up to the year 2000.

In the meantime two of the systems proposed in this telecommunication report (BROADCAST VIDEOTEX and INTERACTIVE VIDEOTEX) are about to be realized; another is about to be tested (CABLE TV). Altogether the development in the field of telecommunication has been much slower in the last five years than had been predicted, mainly due to political reasons.

The main emphasis in the discussion on the introduction of new telecommunication technologies is on political and economic aspects. Social and educational aspects have not received as much attention: one talks about the expected economic impetus of investments of about 100 billion Deutsch Marks and about creating new jobs through telecommunication, but one does not pay as much attention to the possible educational and social impact of the New Media.

Under New Media, one may include:

- Videodiscs
- Broadcast Videotex (teletext like CEEFAX, ORACLE)
- Interactive Videotex (viewdata like PRESTEL, TELIDON, BILDSCHIRMTEXT)
- Satellite TV
- Cable TV
- Interactive Cable TV
- Integrated Telecommunication Systems in Glass Fiber Optics Technology

This paper will concentrate on Videotex and Cable TV.

/Paper presented at the Annual Meeting of the Social Science Education Consortium, Athens, Georgia, 1983.

1. VIDEOTEX

In Videotex there are two technical systems which are easily confused: Broadcast Videotex and Interactive Videotex.

1.1. BROADCAST VIDEOTEX (BV) - German "VIDEOTEXT"

BV consists of the wireless transmission of text in the vertical blanking of the broadcast television picture, i.e. BV is broadcast from a radio station along with the television program.

Insert table 1 here

In order to receive BV on your home television screen, your television set has to have a decoder. The text pages are continually broadcast by the radio station: the recipient can choose the desired text page by typing the appropriate page number on his remote control and can read that page on his screen as long he wants to. The selection time or waiting time for a page chosen depends on the total number of broadcast pages: with a total number of 100 pages broadcast it can take up to twelve seconds. In addition to text, simple graphs are also provided. The text can be overlapped on the running television program (for subtitles in movies) or it can be watched separately on the screen.

BV has been tested since 1980 in a national field experiment. Each person who has a television set with a decoder can receive BV free of charge. Presently 250,000 decoders have been installed. The BV central station is in Berlin. Approximately 200 text pages are offered each day.

The BV program mainly consists of the news, weather report, sports, lottery results, consumer tips, television program guide, plus subtitling from television movies and sport events for those with hearing handicaps.

For educational purposes, BV is hardly being used. Exceptions are listings of educational-relevant television programs and cultural events.

BV could be used for supplementary information for school television programs. For instance, foreign words and special terms could be explained so that the programs become usable in more than one grade. Subtitling may have advantages such as teaching students impaired in hearing and also for foreign language instruction.

As a special feature, BV has the technique of the covered response. In this technique the answer to a question does not appear on the screen until the response key on the remote control has been pressed. This technique can be used for programmed learning or for learning quizzes and for self-controlled tests. The student can try his own answer and afterwards compare this with the uncovered answer. The BV technique is more advantageous for learning at home where each student has his own television set. It is less useful for learning in a group, because each student has to react individually. Furthermore the writing on the screen is too small to be read at a distance as is necessary in a classroom.

As far as we can see today, BV has shown no negative impact on social or cultural life.

1.2. INTERACTIVE VIDEOTEX (IV) - German, "BILDSCHIRMTEXT"

IV combines the home television set with the telephone network. To receive IV one needs a telephone line, a modem for the connection between the phone and the television set, a television set with a decoder, and a remote controller, or --even better -- an alphanumerical keyboard. (A printer would be a luxury.)

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insert table 2 here

The text information is stored by the information providers in the central computer of the Federal Post or in private external computers connected to the system. The IV recipient has direct access to this information through his telephone line. The amount of information on each text page is the same as in Broadcast Videotex: that is, 24 lines with 40 characters each.

IV has been developed in Great Britain and has been introduced in several countries unter various names as VIEWDATA, PRESTEL, ANTIOPE, TELIDON, BILDSCHIRMTEXT.

In the Federal Republic of Germany an IV field project has been carried out in Berlin and Düsseldorf from 1980 to 1983. More than 5,000 households have participated in these research projects. In 1984 IV will be introduced nationwide. Then everybody can become an IV user and theoretically also an IV information provider, if he purchases the technical equipment and pays the set fees.

At the moment there are approximately 4,000 information providers: in total they are currently offering over 300,000 pages in IV. This number will certainly exceed one million pages until 1985.

The information is structured hierarchically and presented in menu form. The user can access the stored information in four ways:

- through the systematic table of contents;
- through the alphabetical index of information providers;
- through the alphabetical subject index;
- through the direct choice of page numbers.

The systematic tabel of contents has nine categories: EDUCATION can be found under Category 7.

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insert table 3 and 4 here

There are a great many pages for the categories of ECONOMY, MONEY TRANSFER, and OFFERS OF GOODS AND SERVICES. On the other hand in the areas of KNOWLEDGE/EDUCATION/CULTURE, there are only approximately 15,000 pages from about 150 information providers.

These information providers are mainly institutions of higher learning and institutions of vocational training and continuing education as well as churches, commercial correspondence schools, and publishing companies. One can expect that in the coming years many more educational institutions will become IV providers and that the total information offered for education will increase rapidly.

Which education-related contents and services can be offered through IV?

- Information on external educational programs
  (addresses, office hours, dates, fees, regulations)
- Registration and ordering
  (course registration with confirmation,
  ordering of books and learning material)
- Lexical information
- Reports and reviews
  (introductions, summaries, literature reviews)
- Courses
  (adjunct courses, refresher courses)
  correspondence courses, programmed learning)
- Information exchange (textual)
  (with teachers, with other learners)
- Computer services (access to external computers)
  (computer assisted learning, information search,
  computer aided problem solving, computer simulation, tests)

In addition there is also the IV personal correspondence service, that is an electronic mail service. With this, each IV participant can send personal news to any other IV user at any time. One can use this technique for ordering forms, books, and audiovisual media, or it can be used for questions to the teacher and for an information exchange among the individual learners.

IV information pages can be coded so that only a certain group has access to this information in the central computer. This is particularly useful for fast information distribution or for continuing education in specific vocations such as physicians.

IV usage can be more versatile if the information provider uses an external computer. The first education institute to use this external computer is the Open University at Hagen. Their students have direct access via IV to the university's computer. In this way the students of the correspondence courses can use a large data bank from their homes. With this, the following services are possible:

- computer aided information;
- registering for courses with immediate confirmation;
- ordering books and learning material;
- computer aided learning;
- tests;
- problem solving;
- simulation experiments.

In case the IV user owns a personal computer at home, then he can quickly transfer computer programs through IV and work them out later on; through this, the online time is held low for the university's computer and for the IV net.

What are the results of the field experiments with IV?

At the beginning of the field trials in 1980, IV was used by half of the recipients at least once a day for half an hour. In 1983, at the end of the experiments, they used IV only three times a week for half an hour each time; that makes an average using time of only one and one-half hours per week. One-third of the children in IV households did not use IV at all: the other two-thirds used it mainly for entertainment.

In comparing the use of IV information categories offered, the category "NEWS" was in top place, while the category "KNOWLEDGE/EDUCATION/CULTURE" ranged only in eleventh place.

When the IV users were asked which attributes they particularly liked in IV, they gave the following answers:

- the information is available at any time of the day 8%
- one has quick and easy access to the information.....31%
- the system is interactive (one can give orders, send information, and can make a computer dialog).....61%

100%

Of the interactive IV services the possibilities of tele-banking and tele-shopping from the livingroom is particularly liked.

On the use of education-related IV offerings, we have made an intensive investigation with 40 IV users in Berlin. In this investigation we found that there is a strong interest in having up-to-date educational news, lexical information, and services (such as registering for courses, ordering of literature), as well as for individual information on problems, and for short, interactive courses. The interviewees feel that in IV there is a lack of personal contact with the teacher and with other students, but this should be coped with through regular personal contact.

The reading of IV text pages takes about one-third more time than reading a page in a book, and it is more tiring. Therefore, IV will not be able to replace the book even if the optical quality is improved.

Nevertheless a high acceptance of IV can be expected particularly in the field of private continuing education and in vocational training. The users have said to be more willing to pay fees for educational programs than for entertainment offerings. In the institutions of higher learning IV will become more important as

a medium for distributing up-to-date information and as an inexpensive access medium to a central computer.

In comparison there will be less use in the schools because IV is virtually an individual medium and not very appropriate for group learning. Therefore, in school IV will mainly play a supplementary function as a source of reference, as a learning aid, and as a tool for remedial learning.

The indirect impact of IV on the school will be much stronger. The information behavior and the learning motivation of the students in general will be changed fundamentally because of increased use of IV at home. If knowledge of any kind can be recalled at any time, the motivation for acquiring knowledge will decrease strongly; search strategies will become more important as well as the ordering of information and the competence in using computers as a working tool.

What impacts will IV have on the personal realm and on family life?

IV is normally used without a partner. Mainly it is used instead of watching television. Still, IV users believe that due to using IV they communicate about 5% less with their family than before. And if the family had only one television set or only one telephone line, then quarrels did arise in the family about IV use. The users believe that IV leads to being better informed on cultural and political events, and that it particularly saves time through tele-shopping, tele-banking, and tele-visits to official offices. That raises the question as to whether personal contacts are being reduced. IV users dont't believe this. They believe that through IV one can even make new personal contacts; there are ads in IV for making new acquaintances.

The highest interest for IV is found in business people, but can also be found in private persons with a higher education and with technical interest who are between 30 and 40 years old; this is true of men of these groups much more than of women. Today's

IV users show to be technically better equipped than average people.

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insert table 5 here

The main argument against IV is the danger of misuse of the private user data. In order to bill the users and to pay the information providers, the user behavior of each IV participant is stored in the Federal Post computer at least for some time. A misuse of these data cannot be completely excluded.

2. CABLE TV

In the Federal Republic of Germany radio and television belong to public radio stations. They broadcast on two nationwide and five regional television channels. Up to now there have been no private radio and television stations in West Germany, mainly because of a shortage of frequencies. Visitors from the United States generally judge the quality of the programs in a positive way. About 40% of all households are connected to smaller coaxial cable systems in residential districts and they can receive additional television stations from neighboring countries. Adults watch television at an average of approximately two hours per day, adolescents from 8 to 13 years watch about one and one-quarter hours, and children from 3 to 7 years watch about 45 minutes. During the last few years, the television consumption has decreased a few minutes.

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insert table 6 here

On weekends watching television is relatively higher than on weekdays. The main viewing group consists of people over 50 years old; for all age groups one can say the less school education, the higher the television comsumption.

In the past few years there has been a long discussion on the introduction of cable television in the Federal Republic of Germany, mainly because the new technology allows commercial radio and commercial television. Cable television is demanded by representatives of the industry, and this demand is supported by the present government which expects from cable television a greater variety of opinions.

In the discussion one distinguishes between one-way Cable TV and two-way Cable TV.

2.1. With one-way Cable TV one can distribute a larger number of television and radio programs with good technical quality via cable networks; one coaxial cable can carry about 30 television channels.

With Cable TV group-oriented and special programs become possible. If financing is provided, special channels can be made available for education with programs for schools or for autonomous learning.

2.2. With two-way Cable TV including a feedback channel --in small or broadband -- completely new forms of telecommunication become possible. Through the feedback channel, the user can send information back to the service center: i.e., he can type in multiple-choice answers, recall programs, and he can even send moving pictures as in picture phone through the service center to other users. In this latter case, however, the feedback channel must be a broadband channel.

One can imagine a may-sided use of a two-way Cable TV system in the field of education. The services are similar to those of Interactive Videotex. However, in addition, sound, still, or moving pictures are possible with two-way Cable TV. For example, correspondence courses with sound and picture interactions become possible in both directions. The teacher or the private learner at home is also able at any time to recall educational films or audiovisual learning programs from the service center.

+ table 7 here

In the Federal Republic of Germany four pilot projects are being planned for testing the possible uses of cable television. In these field tests the technical possibilities, the actual use by the customers, as well as the economic and social consequences are to be investigated.

The cable projects in Munich and Ludwigshafen are to start during Christmas 1983 only as one-way systems. Later on a feedback channel will be added.

In the projects in Dortmund and Berlin the feedback channel is planned to be used from the beginning for interactive services, but the planning has not been completed as yet.

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insert table 8 here

The representatives in the field of education in the Federal Republic are generally skeptical about the introduction of cable television. On the one hand they see the possible benefits of this system, but at the same time they fear the rather negative effects on society, especially on the children. Cable TV is supposed to lead to an enormous influx of entertainment programs; people would hardly be able to resist this temptation, especially children and the young people, and as a result they would spend more time watching television.

The increase of programs is believed to lead to a stronger disintegration of society. Each person will have access to different information sources, and as a result there will be less common ground for conversation. Instead specialization will increase.

Through the introduction of commercial television it is feared that the quality of the programs will be lowered, because only relatively mediocre programs will reach large numbers of viewers. Programs with a high quality and information services will mainly be used

by people with a good educational background. The effect will be that the gap between the educated and the uneducated or between those rich in information and those poor in information will become larger instead of smaller.

There is another indirect effect of the new media: the means by which we receive information with the future technology will influence the structure of our thinking on a long term, especially the use of computer language and the increase of visual learning. The television set will become an information terminal.

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insert table 9 here

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3. New Media and Consequences for Education

In the spring of 1983 at the Free University of Berlin we conducted an investigation among 30 students of education, psychology, and journalism on their opinions of the new media. This revealed that for the students, the New Media are just now becoming an actual political issue.

About 60% of the students questioned had a definitely negative opinion about the New Media. They grounded their rejection mainly on the four following apprehensions:

1) They fear an increase of political and economic influence on the individual through the New Media because they believe that the New Media lead to a greater concentration in the media field through powerful companies.

2) They fear a decrease of direct social communication through tele-shopping, tele-banking, etc. and through this an increase of anonymity in society.

3) They fear that the New Media will lead to a further rationalization in many professions, thus causing many jobs to be lost. The number of new jobs created by the New Media will be few by comparison.

4) They fear that the automatic registration of the media consumption behavior could lead to an increase in the control of private life.

In this investigation it became evident that the negative attitude towards the New Media correlates highly with the general apprehension toward the technological advancement. The danger attributed to the New Media are considered just as bad as the dangers through atomic weapons and environmental pollution.

The students as a minority see the only possibility left for them to stop the development of the New Media is in protesting or in quietly resigning, because the majority of the people will accept being led into the promised media land through a tempting increase of additional entertainment.

How should education as a profession react to the introduction of new communication technologies? Should one try to stop it or at least to delay it?

I doubt that educators are influential enough to stop the development of these technologies. It appears to me that a forward strategy is much more promising: the advantages of the New Media should be used as far as possible for the goals of education. This will be possible only if educators will engage themselves in the formulation of regulations for the New Media, in the planning of public projects, and do not leave this field to industry and politics.

The second task is to intensify media education in the curricula. Current media research leads us to expect that the education of people is the main defining factor for their future media behavior.

Therefore, teachers, parents, and finally the children must learn to handle the telecommunication media as tools, which can be exploited for their personal needs and interests. Active media education will be one of the main tasks for the home and the school for the coming decades. This goal will be only reached if teachers and parents themselves show a positive modeling behavior.

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SUMMARY

Experiences with German VIDEOTEX and expected effects of the planned Cable-TV-Systems on education

Since 1980 the German Videotex system (Bildschirmtext) is being tested in West-Berlin and Düsseldorf. In each of these cities about 1500 homes are connected via telephone line to the central computer of the post office. This allows them to retrieve information of about 300 000 pages and get the chosen information displayed on their television screen.

Although still few, compared to pages containing economical information, the number of Btx pages containing education-related information is encreasing rapidly. The universities are using the new medium for giving compact information on enrolment, courses offered, and special events. They also present short courses directly via videotex, e.g. on studying techniques. The German Open University is using videotex for gathering feedback from the distant students more quickly. There are private videotex information providers selling direct learning help via the medium to pupils and students. Programmed learning courses are being offered and counselling is provided for parents and students.

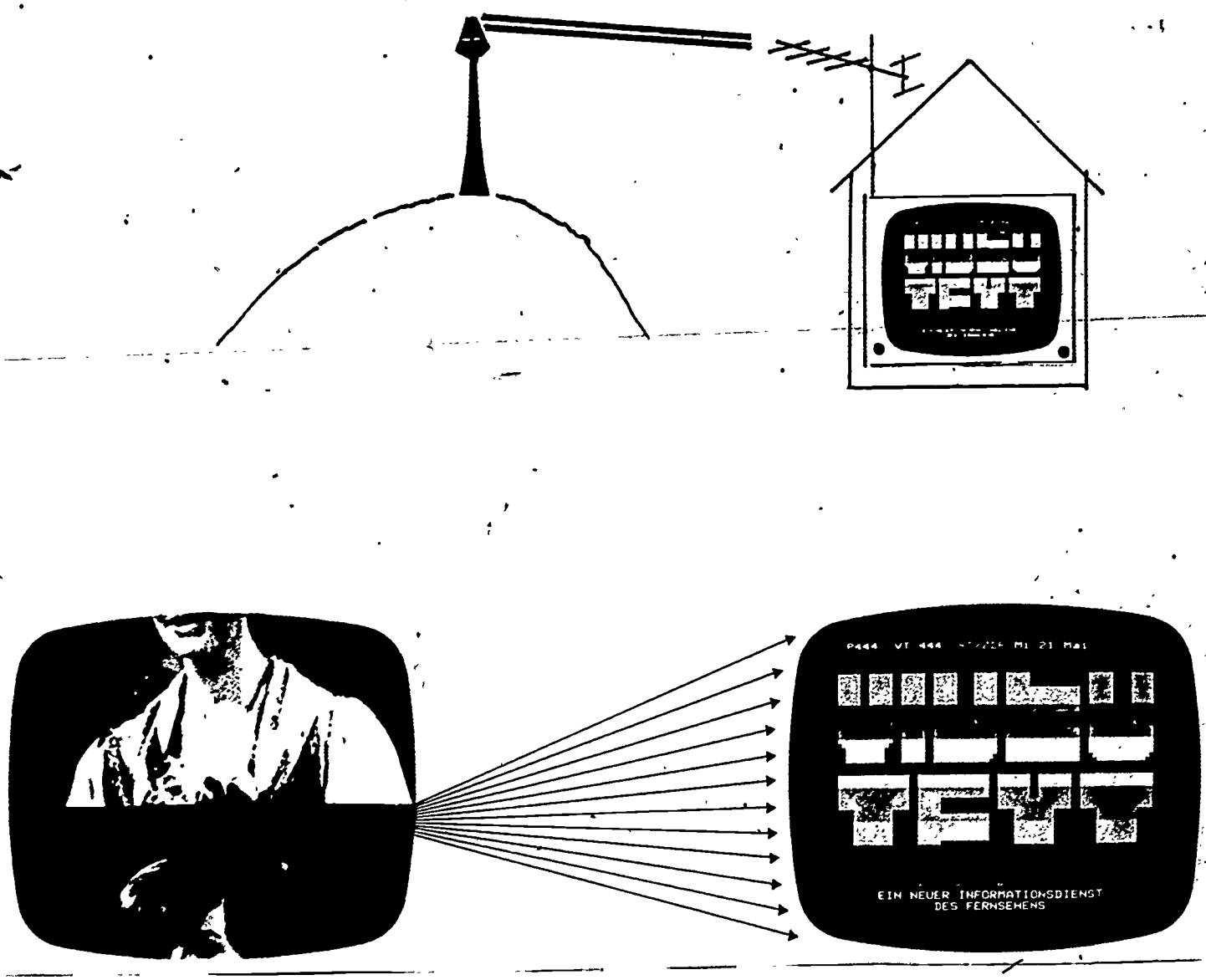
After fall 1983 videotex will gradually be installed in all parts of West-Germany.

Also in 1983/84 cable television systems will be put up in four cities providing 12 to 60 TV channels and interactive information services.

While industry expects from the new electronic technology economic growth and reduction of unemployment rate, a great part of the young generation is strongly opposing this development as a threat to personal communication and interaction of people.

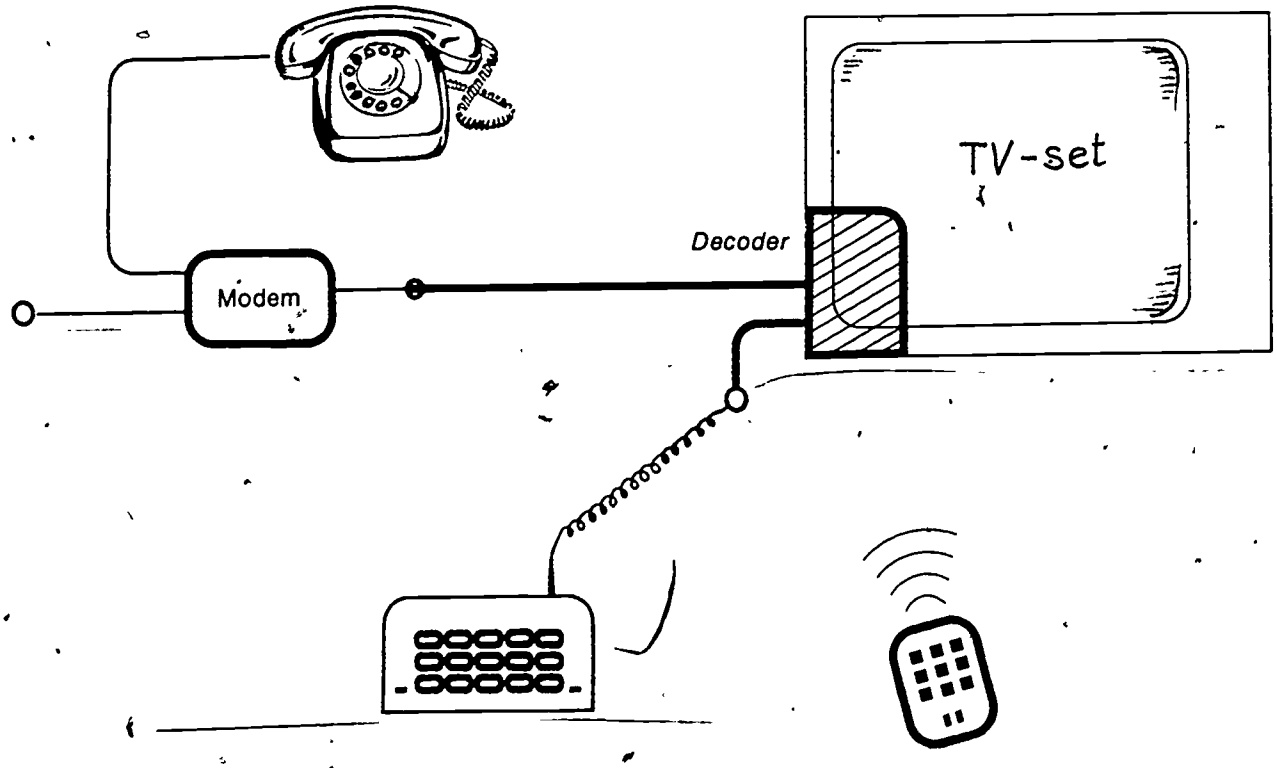
Educational institutions are investigating the possible use of the new media especially for remedial instruction and further education.

Paper presented at the Annual Meeting of the Social Science Education Consortium, Athens, Georgia, 1983.



BROADCAST VIDEOTEX ("VIDEOTEXT")

Table 1



INTERACTIVE VIDEOTEX ("BILDSCHIRMTEXT")

Table 2

INTERACTIVE VIDEOTEX
INFORMATION CATEGORIES

0 NEWSPAPERS, MAGAZINES, BOOKS, RADIO, TV

1 ECONOMY, BANKING, INSURANCES

2 GOODS AND SERVICES

3 COUNSELLING, HELP, CONSUMER INFORMATION

4 ADDRESSES, REGISTERS

5 STATE, COMMUNITY, ADMINISTRATION, POLITICAL PARTIES, CHURCHES, ORGANISATIONS

6 TRAFFIC, TRAVELLING, WEATHER

7 KNOWLEDGE, EDUCATION CULTURE, LEISURE TIME

8 EVENTS

Table 3

7 KNOWLEDGE/EDUCATION/CULTURE/LEISURE TIME

70 KNOWLEDGE

71 SCHOOLS, COLLEGES, UNIVERSITIES

72 VOCATIONAL TRAINING, CONTINUING EDUCATION

73 ADULT EDUCATION, ADULT COLLEGE

74 MUSIC, THEATER, FILM

75 MUSEUMS, COLLECTIONS, SIGHTS

76 DOCUMENTATION CENTERS

77 LIBRARIES, ARCHIVES

78 STATISTICS

79 HOBBIES, GAMES, SPORTS

Table 4

ELECTRONIC EQUIPMENT IN HOMES WITH INTERACTIVE VIDEOTEX

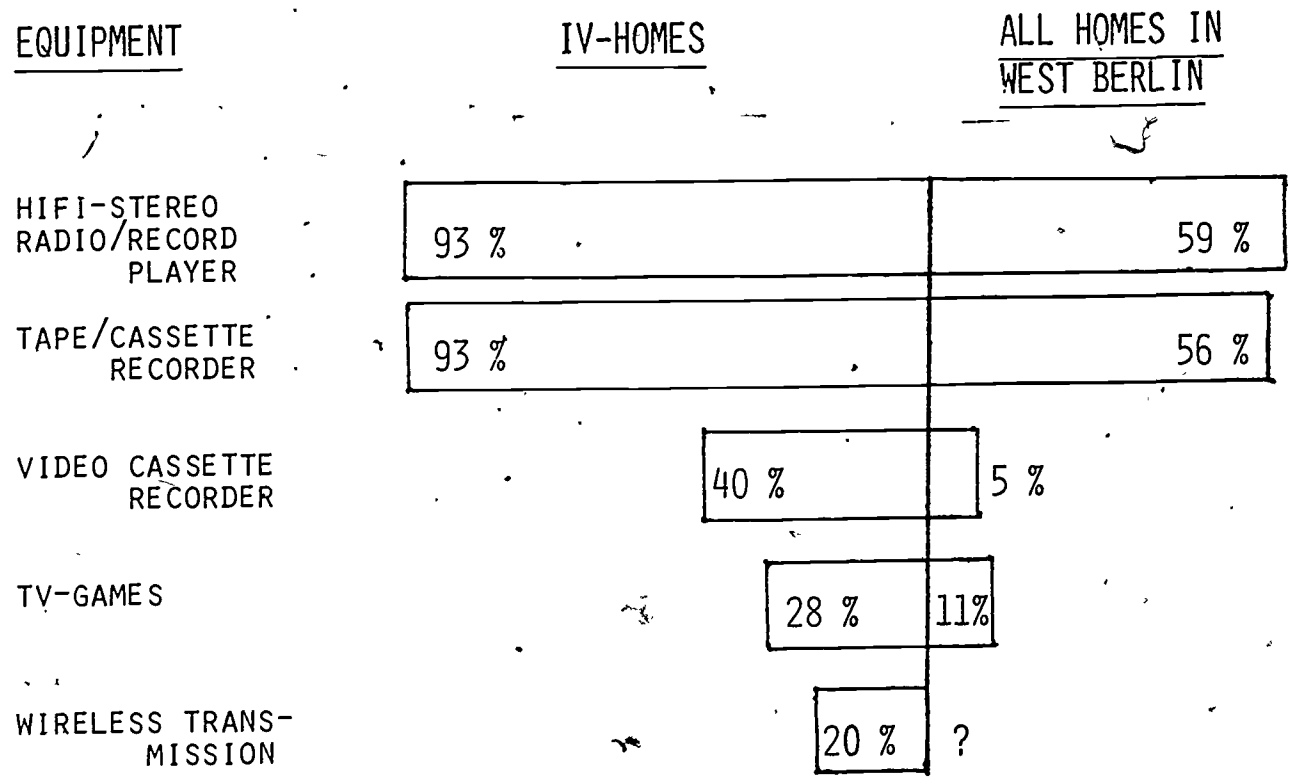
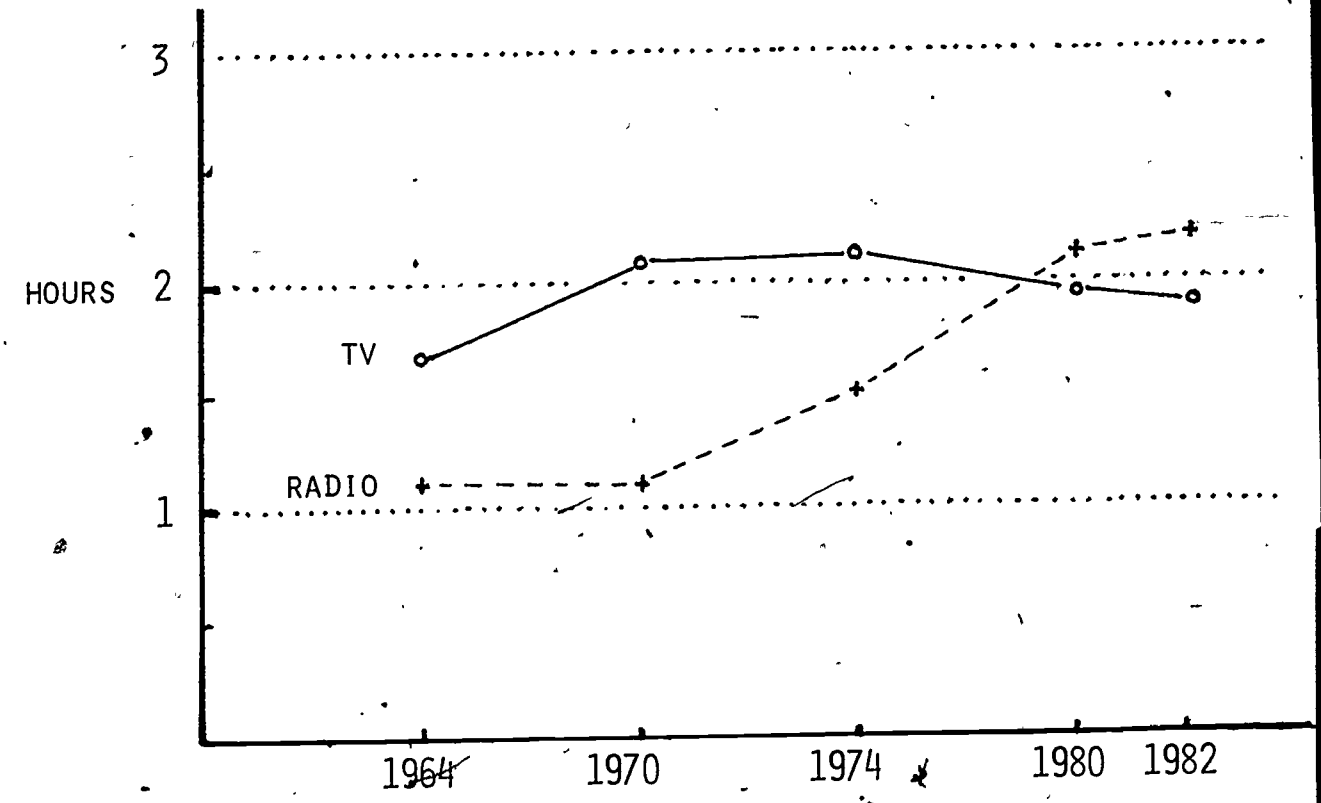


Table 5

Table 6

MEDIA USE (WORKDAYS)



EDUCATIONAL INFORMATION SERVICES IN INTERACTIVE CABLE-TV SYSTEMS

INFORMATION ON EXTERNAL EDUCATIONAL PROGRAMS

ADRESSES, DATES, FEES, REGULATIONS

LEXICAL INFORMATION

SUPPORTED BY STILL AND MOVING PICTURES

EDUCATIONAL TV-PROGRAMS / FILMS AT ANY TIME

SINGLE CONCEPT FILMS

COMPLETE PROGRAMS/FILMS

ADAPTIVE LEARNING PROGRAMS

COMPUTER-ASSISTED INSTRUCTION

SIMULATION EXPERIMENTS AND PROBLEM SOLVING

INDIVIDUAL TESTING AND INSTANT FEEDBACK

TUTOR DIALOG

ACTUAL LEARNING HELP

COUNSELING

DIALOG WITH OTHER LEARNERS

GROUP INSTRUCTION

FREE DIALOG

CABLE-TV PILOT PROJECTS IN WEST GERMANY

CITY	CHANNELS	NO. OF SUBSCRIBERS	ADVERTISING	INTERACTIVE CAPABIL.	PROGRAMMES/ SERVICES	DATE OF START
MUNICH	60 RADIO/ TV	10.000	YES	(YES)	EXISTING RECEIVABLE TV PROGRAMMES	1983
LUDWIGSHAFEN	24 TV 24 RADIO	30.000	YES	(YES)	ADDITIONAL LOCAL AND SPECIAL TV PROGRAMMES, OPEN CHANNEL	1983
DORTMUND	21 TV 18 RADIO	10,000	NO	YES	TEXT SERVICES, INTERACTIVE SERVICES	1984
WEST BERLIN	12 TV 20 RADIO	10.000	?	YES	SPECIAL PROGRAMS, INTERACTIVE SERVICES, PAY-TV OPEN CHANEL	1984

AIM: INVESTIGATION OF SOCIAL, ECONOMIC, AND CULTURAL IMPACT.

Table 8

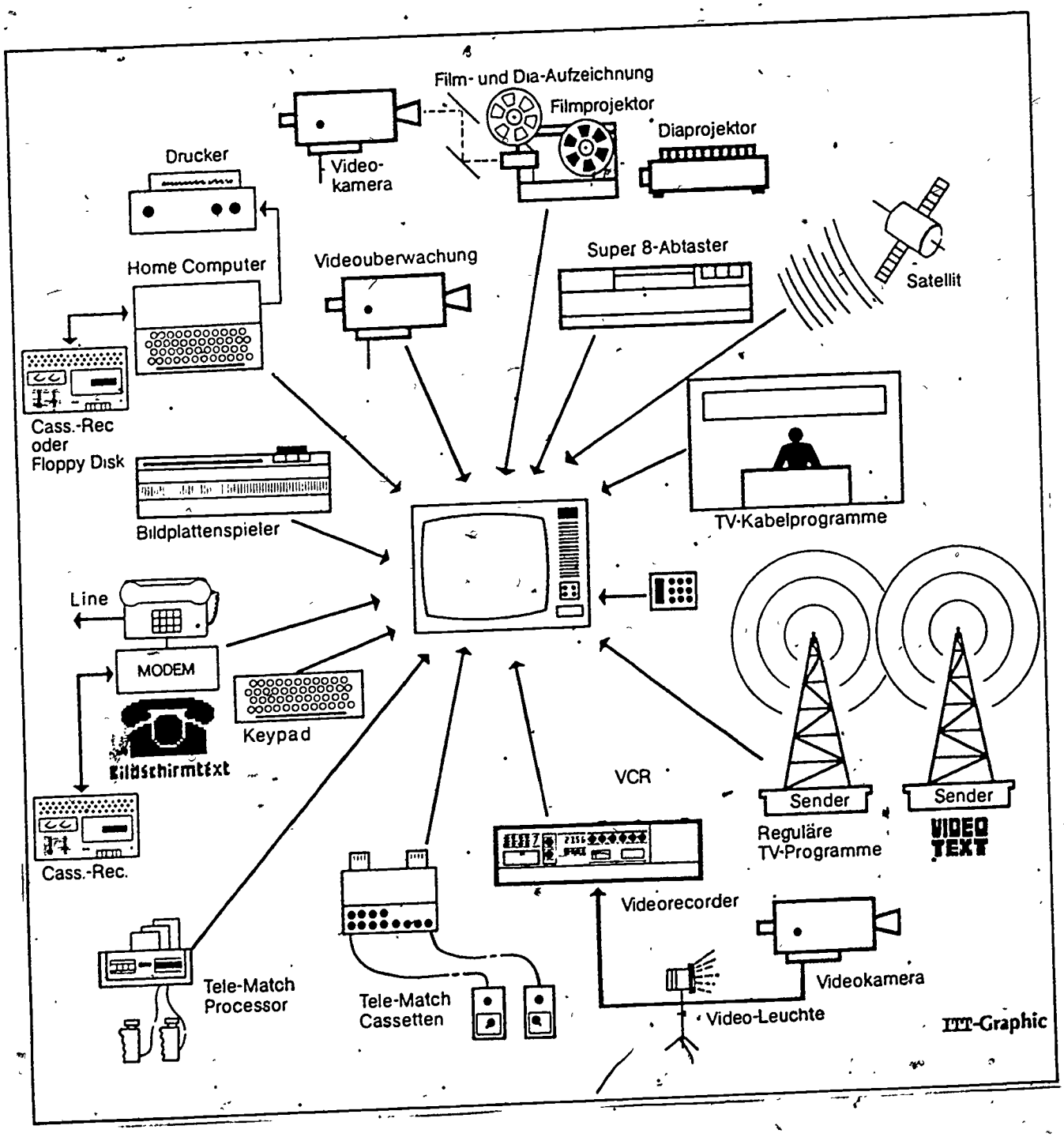

Film- und Dia-Aufzeichnung
Filmprojektor
Diaprojektor
Video-
kamera
Drucker
Home Computer
Videouberwachung
Super 8-Abtaster
Satellit
Cass.-Rec
oder
Floppy Disk
Bildplattenspieler
TV-Kabelprogramme
Line
MODEM
Keypad
Bildschirmtext
VCR
Sender
Reguläre
TV-Programme
Sender
VIDEO
TEXT
Cass.-Rec.
Videorecorder
Videokamera
Tele-Match
Processor
Tele-Match
Cassetten
Video-Leuchte
ITT-Graphic

Table 9