ABSTRACT
            The report consists of three major sections: a review
of the literature on correspondence education in the United States, a
report of research at Stanford University on computer-assisted
instruction (CAI) in the home, and an extensive cross-referenced
annotated bibliography. The literature review is organized under six
main subsections: enrollment trends, factors influencing completion
rates, characteristics of correspondence students, correspondence
work versus residence work, course presentation methods, and a
partially annotated bibliography of references cited in the review.
In the described home-based experimental CAI program for gifted
junior high school students, 28 students were able to receive courses
in elementary and college logic, computer programing, and foreign
languages via teletypewriters placed in their homes and linked by the
home telephone line to the computer. The bibliography, covering the
home-based instructional uses of computers, television, and other
media, has three subsections. The first is the annotated bibliography
which contains references divided into five groups: computers in
education, television and videotape, multimedia, nontraditional
study, and reference materials. The second subsection assigns to each
reference a list of descriptors appropriate to it. The third
subsection assigns to each descriptor the appropriate references.
(Author/MS)

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HOME-BASED EDUCATION:

NEEDS AND TECHNOLOGICAL OPPORTUNITIES

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INTRODUCTION

This report consists of three major sections. Section I is a review of the vast literature on correspondence education in the United States. Section II is a report of our work at Stanford University in computer-assisted instruction in the home; the details of this research have been included because work in this field is relatively limited thus far. The final section is an extensive cross-referenced annotated bibliography surveying the instructional uses of computers, television, and other media.

We have organized the literature review under six main subsections. The first subsection discusses the increasing numbers of correspondence students and shows the trends over the years. The second subsection concerns the tendency of many correspondence students not to complete the courses they have begun and cites literature in which attempts have been made to relate completion rates to personal or course factors. We have summarized literature about characteristics of correspondence students in the student profile subsection under the subheadings of age, sex, occupation, education, geography, subject areas, reasons for taking correspondence courses, and data relating the individual factors. In the fourth and fifth subsections we cite literature comparing correspondence work to residence work and comparing different methods of presenting and conducting correspondence courses. Following the literature review is a partially annotated bibliography containing only the references cited in the review; its purpose is to provide easy access to statistics such as the kind and number of students used in a particular study.

In Section I, we have restricted our survey of correspondence study to correspondence study within the United States. Within this limitation we have not attempted to include every available reference, but rather we have attempted to present a representative sample of the available material. We have excluded many studies on correspondence courses in the military and correspondence courses for overseas dependents; we have also excluded

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correspondence study in hospitals and agricultural extension courses.

Section I. is a preliminary report of a home-based computer-assisted instruction (CAI) experiment. In the fall of of 1973 the Institute for Mathematical Studies in the Social Sciences (IMSSS) began an experimental home-based CAI program for gifted junior high school students.[1] The students were able to receive courses in elementary and college logic, computer programming, and foreign languages via teletypewriters placed in their homes and linked by the home telephone line to the IMSSS computer. With the exception of proctor help, which was available by telephone during certain limited hours, the students were entirely dependent on the computer for course instruction and for the presentation and correction of problems and exercises.

Section III is a cross-referenced annotated bibliography covering the home-based instructional uses of computers, television, and other media. This section was designed to aid in a search for recent references (1970 to the present) concerning a particular aspect of educational media. Again, we have not included every work on instructional media, but rather we have presented a representative sample, as well as many bibliographies which may be pursued by the interested reader. There are three subsections in Section III. The first subsection is the annotated bibliography, which has been divided into five groups: computers in education, television and videotape, multimedia, nontraditional study, and reference materials. Since very few references can be described in exactly one way, we constructed a list of descriptors for the references. The second subsection assigns to each reference a list of the descriptors appropriate to it; the third subsection assigns to each descriptor the appropriate references. Additional explanation and discussion of Section III immediately precedes the bibliography.

We had originally intended to include a separate section on a technical analysis of the various technologies for home-based instruction and also a section on an economic analysis of the technologies. The

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technical analysis is fairly well covered in the annotated
bibliography in Section III of the present
report: Representative samples of the use of radio,
television, and computers for home-based instruction are
given. And in Section I there is, as we have said, an
extensive survey of the traditional means of instruction
in the home, namely, correspondence study.

In contrast, we were disappointed in the extent to
which we were able to identify in the literature any
economic analysis of the various technologies for home-
based instruction. From a variety of considerations it is
clear that ordinary correspondence courses are at the
present time the cheapest means of delivery of
instruction, but, as far as we were able to determine,
there has as yet been no extensive analysis of the costs
of the other technologies. Costs, of course, represent
the simplest kind of question. There is, as far as we can
see, absolutely no literature on any attempt to construct
education production functions for the various
technologies that can be used for the delivery of home
instruction. Moreover, the data for making such an
analysis are not yet actually available. We return to
this subject in our section on conclusions and
recommendations.

I. LITERATURE REVIEW OF CORRESPONDENCE STUDY

Usage

Enrollment in correspondence schools in the United States has climbed from under 500,000 in 1910 to over 3,000,000 in 1970; this increase is illustrated in Figure 1, which shows findings of a 1972 survey of home study enrollment (Bolina, 1972).

Kempfer (1973) estimates the current total correspondent student body to be 5,018,630. A summary of his data is shown in Table 1; he arrived at the estimate of over 5,000,000 based on an analysis of incomplete responses and projections of other known factors. The student-body figure includes enrollments in a previous year for courses often requiring as long as three years to complete. The largest single user of correspondence instruction is the federal government; especially the armed forces, which enrolls almost 2,000,000 students annually.

Estimates of total enrollment by the National Home Study Council (1967) are higher; they estimated that 5,270,913 students were enrolled in United States correspondence courses in 1966. They also estimated that over 8,000,000 students throughout the world were studying by correspondence. In 1966, the National Home Study Council (1966) surveyed major free-world correspondence schools outside the United States. Sixty-three schools in 29 countries reported a total student body of 2,277,524, with 1,142,633 students enrolling during 1965 in 12,903 courses of study.

Completion

Completion rates. Studies of completion rates--that is, the percentage of enrolled students who complete correspondence courses--indicate that, with few exceptions, completion rates have been, and still are, relatively low. Before citing the data, we need to give two cautionary notes about interpretation. Kempfer (1973) noted that dropout data are limited in usefulness because many students enroll in a course with no intention of
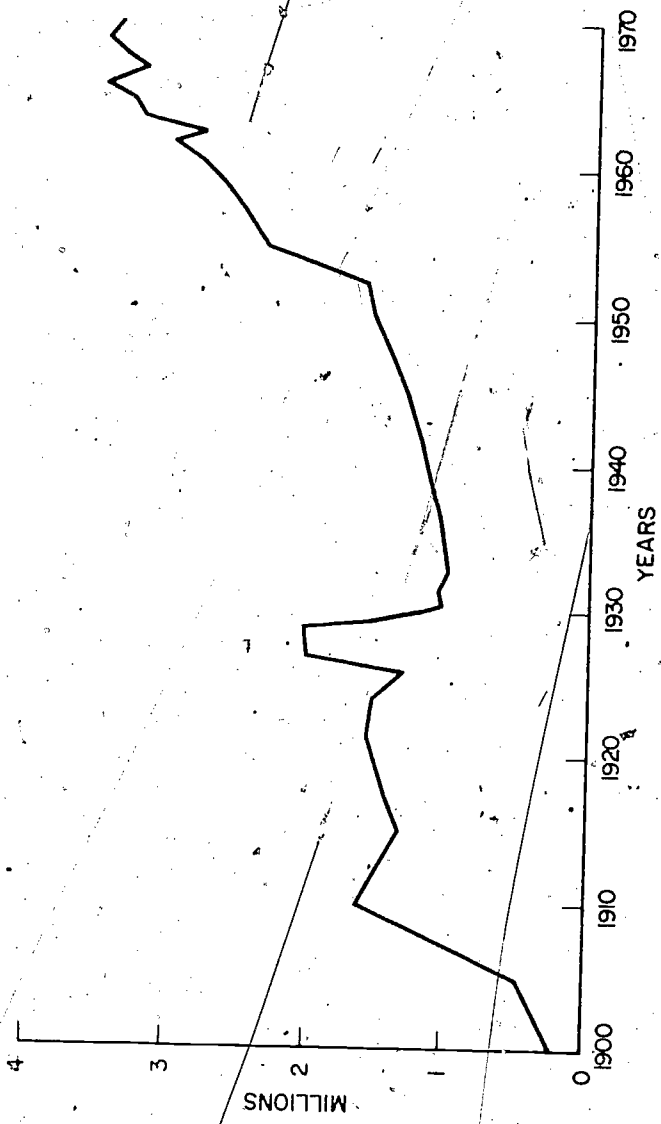
Figure 1. Total enrollment in correspondence schools in the United States, 1900–1970 (Bolina, 1972).

Table 1

Size of Enrollment and Student Body in Correspondence Education,
by Type of School, 1970 (Kempfer, 1973)

Type of School	Student body	Enrollment
Private schools	1,850,197	790,492
NHSC members	(1,630,128)	(649,913)
Nonmembers	(220,069)	(140,579)
Federal and military	2,185,701	1,851,493
Colleges and universities	312,592	234,212
Religious	323,720	307,717
Business and industry	68,891	43,671
Total: All Schools	4,741,101	3,227,585

completing it. They are only interested in a particular
segment of a course but must enroll in the entire course
to receive that segment.   MacKenzie,   Christensens, and
Rigby (1968) mention another problem, which is that
individual suppliers have different criteria for course
completion: Some say that the course is completed if a
certain percentage of the lessons has been completed, some
say that all the lessons must be completed, and some say
that all the lessons and the final examination must be
completed. Most of the studies we found did not indicate
which criterion was being applied, so the figures we cite
may not be strictly comparable.

Bittner and Mallory (1933) surveyed 25 state
university extension divisions in the South, West, and
Midwest; their results are shown in Table 2.   They found
completion rates ranging from 40 percent at the University
of Oklahoma to 86 percent at the University of North
Dakota; the overall completion rate was 61 percent. They
also measured something they called "success rate," which
was defined to include students who completed at least 70
percent of the required work and students who were
transferred to residence work; the overall success rate
was 75 percent. Kennan (1940) studied private schools in
the United States--in particular, the International
Correspondence Schools (I.C.S.) and the Women's Institute
(W.I.)--and found a much lower completion rate of 20
percent. Tempest (1965) studied the home-study completion

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Table 2

Completion Rates in 25 State University Extension Divisions
(Bittner & Mallory. 1933)

Institution	Date	Enroll-ments	Suc-cess rate %	Comple-tion rate %	Mortal-ity rate %	Cor-rected comple-tion rate. %	Cor-rected mortal-ity rate. %
Alabama	1929-30	400[a]		64.5	15.5		
Arizona	1929-30	642		52	48	55	45
Arkansas . . .	b	1.093	85	78	22	83.5	45
California . .	1928-29		c	51	49		
	1929-30			65	35		
Chicago	1930	1.112	77	69	31	75	25
Colorado . . .	1929-31	781	94	66	34	88	12
		2.300	70	54	46	64	36
		1.324	90	72	28	90.2	9.8
Florida	1929-30	1,413	68.97	68.2	31.8	75.3	24.7
Georgia	1929-30	1.867		64	36		
Indiana	1926	715	66.3	59.1	40.9	61.8	38.2
	1926-27	450	73	57.5	42.5	61	39
Kansas	b	920	70	42	58	67	33
Kentucky . . .	1919-29	3.311		64.5	35.5		
Louisiana . . .	b	766	66	57	43	66	34
Minnesota . . .	1925-26			54	46		
	1926-27			56	44		
	1927-28			51.4	48.6		
	1928-29			50	50		
	1929-30			53.5	46.5		
	2/1930	163	68	44.15	55.85	54	46
Missouri . . .	1930	1.000	80.5	65	35	76	24
Nebraska . . .	b	927	75	61	39	72	28
North Carolina	1930	2.401		74	26		
	b	181	89	86	14	89	11
Oklahoma . . .	b	1,676	46	40	60	47	53
Oregon	1929	2.022	68	52	48	61	39
South Dakota .	1926-30	1.736		61	39		
	1928-29		85	69	31	85	15
Tennessee . . .	1929-30	100[a]		65	35		
	b	c		74	26		
		400[a]	82	71.5	28.5	82.2	17.8
Texas	1927-28	d		57	43		
	1928-29	d		54	46		
	1929-30	d		57	43		
	1930[b]	492	78	58	42	70	30

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(Table 2. continued)

Institution	Date	Enroll-ments	Suc-cess rate %	Comple-tion rate %	Mortal-ity rate %	Cor-rected comple-tion rate, %	Cor-rected mortal-ity rate, %
Utah	1929-30	699		55	45		
Washington U. .	b			75 .	25		
Wash. State C.		642		45.6	54.4	56.6	43.4
Wisconsin . . .	1927-28	7.073		49.9	50.1		
	1928-29	4.568		62.5	37.5		
	1929-30	5.018		60.6	39.4		
Total		45.812					
Averages			75	61	39	71	30

[a] Students for respective years.

[b] Alphabetical or numerical sampling over a period of years.

[c] Enrollments.

[d] Semester hours 8,964, 8.749, 8;589 for the respective years.

[e] Computed from eliminations.

rates at the University of Utah. He found a completion
rate of 56.5 percent and a so-called "net completion rate"
of 70.6 percent. The net completion rate was based on the
formula: number completed divided by the difference of
the total count and the number who returned no
assignments. Ball, Kim, and Olmstead (1966) selected a
random sample of 1,000 persons registering for
correspondence courses at the University of Washington at
Seattle and found a completion rate of 40 percent. As a
comparison, we will from time to time in this paper cite a
study of apprentices in the construction industry
(McCauley, 1962). The results of McCauley's survey of
apprentice dropouts from 1952 through 1960 are similar to
the findings concerning correspondence dropouts; the
completion rates did not rise over the years. The
completion rate in 1952 was 53.4 percent and the
completion rate in 1960 was 48.8 percent, with values
close to 50 percent in the intermediate years.

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Personal factors as they relate to completion.
Personal factors of students--including age, sex,
intelligence and aptitude, educational level, study
habits, work in first few weeks of course, reasons for
taking the course, and reasons for dropping the course--
have been examined to see if any relation could be found
between them and completion. Kennan's (1940) data
revealed no relationship between age and completion among
students studying at I.C.S. and W.I. The ages having the
highest relative completion rates in order are,
approximately, 50 years, 19 years, and 30 years. Ritter
(1965) studied 10 years of correspondence courses. (1954-
1963) at the State College of Iowa. The median age of
students completing correspondence courses ranged from a
low of 32.4 years in 1961-62 to a high of 48.2 years in
1954-55. There were no tendencies for the median age of
those completing the courses to increase or decrease over
the years. Ball et al. (1966) and Donehower (1968), on
the other hand, found that age was positively associated
with completion. Ball found that only 34 percent of the
students 34 years and under completed their courses while
57 percent of the students 35 years and over completed
them; Donehower found that the mean age for completing was
32.9 years and the mean age for withdrawing was 30.9
years.

Concerning sex and completion, Smith (1935), in his
large sample of 5,700 students from the years 1925 through
1932, found that more women completed correspondence
courses then men. Ritter (1965) found that approximately
70 percent of the students completing courses were married
women, 23 percent were unmarried women, and the rest (7
percent) were men of unknown marital status. Ball et
al. (1966), looking at the statistics in a different way,
found that 33.4 percent of the males who enrolled, and
47.8 percent of the females, completed their courses.

Childs (1963), in a survey of supervised
correspondence courses concluded that whether intelligence
or aptitude is an important factor in determining which
students will finish a course is unclear from the
available evidence. She says that pupils who register for
correspondence courses are, in general, above average in
ability and that there may be a slight but not pronounced
tendency for those of greater ability to complete the
courses they begin. There is also, according to Childs,

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some evidence that pupils who are rated higher by their supervisors on personal characteristics that may affect success in correspondence study are somewhat more likely to complete their courses than are pupils who are rated lower.

The work of Smith (1935) and Donehower (1968) suggests that adults with higher educational training complete their courses more frequently than do those with less formal schooling. The same relationship was found by Ball et al. (1966) thirty years later: the higher the level of education, the higher the percentage of students completing their courses. Hughes (1955) questioned 249 correspondence students at the University of Florida and found that prior college experience and prior correspondence study experience both had a statistically significant positive effect on completion rates. Hughes also investigated the relation of study habits to completion but found no difference in successful and unsuccessful students with regard to study habits.

Many studies have indicated that students who complete the first assignments of a course soon after receiving them are more likely to complete the course. James and Wedemeyer (1959), for example, interviewed 55 adults and 125 high school students taking correspondence courses through the Extension Division of the University of Wisconsin. All except four of the students who did not complete their courses quit before completing the first third or fourth of their assignments. James and Wedemeyer concluded that if a student hands in the first third or fourth of his course work, he will probably complete the course. Similarly, Donehower (1968) found that students who submit lessons soon after enrolling are much more likely to complete the course, and Ball et al. (1966) found that students who complete a course are most likely to do so in the first 12 months. Pfeiffer's (Pfeiffer & Sabers, 1970) data indicate that students who completed the first lesson have a high probability of completing the course. A student in a one-hour course who submitted one lesson had an 85 percent chance of completing the course, and a student in a two- or three-hour course who submitted one lesson had a 70 percent chance of completing the course. Students in the Glatter and Wedell (1971) survey of correspondence in Britain had the highest incidences of dropout in the early stages of a

course. Correspondingly, dropouts are more frequent during the early stages of apprenticeship (McCauley, 1962); approximately a third of all dropouts, are reported during the first 25 percent of the term, with the remainder of the losses being spread rather evenly over the latter 75 percent of the apprenticeship.

Donehower (1968) found no correlation between living distance to the correspondence center and time to complete, but he did find a small correlation between living distance to the center and whether the course is completed.

Kennan (1940) did not find strong relationships between reasons for taking a correspondence course and probability of completion. The mean percent of lessons completed for those taking courses definitely associated with their occupation was not appreciably higher than that for groups showing no such association. There was a slight tendency for people who were studying courses for avocational or cultural reasons to complete a larger portion of their courses than people who studied for vocational reasons. There is also a slight tendency for people with the objective of transferring to a new occupation to study more persistently than those who are seeking only to improve their present work. Hughes (1955) found that students who desired teacher certification had a 79.5 percent completion rate, those seeking college credit for degrees had a 62.2 percent completion rate, and those seeking general vocational-professional improvement had a 55.1 percent completion rate. He also found that the necessity for meeting a deadline had a statistically significant positive effect on the completion rates. Ball et al. (1966), too, found that students taking courses for teacher certification had the highest completion rate-- 61.7 percent. Those taking the course for university credit had a 38.0 percent completion rate, those taking the course for general interest had a 29.3 percent completion rate, and all others combined had a 26.2 percent completion rate.

Several studies (Bittner & Mallory, 1933; Fairing & Hugfies, 1950; James & Wedemeyer, 1959; Hartsell, 1971; Kennan, 1940; Sloan, 1966) have questioned dropouts concerning their reasons for dropping out or for their disinterest. Data from these studies are presented in Table 3; we have sometimes combined categories or changed

the wording slightly from the original to fit the results into a common table.

The main reasons given for dropping out have remained stable over the years: lack of time; complaints about the course itself, e.g., the work is too boring, too difficult, or has too little human contact; and change of plans, such as rescheduling the course to residence work or beginning a new occupation that does not require the course. Other problems have been illness, financial problems, and lack of library facilities or other materials.

Glatter and Wedell (1971) surveyed part-time students in general and concluded that correspondence study is not more affected by dropouts than part-time study. Thirteen percent of their sample of 960 students whose main method of study was correspondence dropped out, while 12 percent of their sample of 840 students using the part-time oral method did so. The three most common reasons for dropping out for part-time students were similar to reasons given by the correspondence dropouts: The strain of combining study with work was too great, there was a change in career plans so the course was no longer required, and the demands of the students' domestic responsibilities had increased. A similar comparison was made by Kennan as early as 1940 with similar results. He compared the percentage of correspondence students who dropped out for reasons other than dissatisfaction with the course to the corresponding percentage of dropouts from nine colleges and concluded that the percentage of dissatisfied correspondence school dropouts is not much greater than the percentage of dissatisfied college dropouts.

Course factors as they relate to completion rates. Some investigators have tried to find characteristics of the courses themselves that influence completion rates. Ball et al. (1966) found that the course type has a definite influence on number of completions; the highest percentage of completions (62 percent) was for education courses and the lowest (24.3 percent) was for business administration. Bradt (1956), from his study of 5,000 USAFI correspondents, and James and Wedemeyer (1959), from their study of the University of Wisconsin Extension Division correspondents, concluded that courses with goals stated clearly are more likely to be completed. Kennan (1940) found that persons who pay cash for their courses

Table 3

Reasons Given for Dropping Course or for Disinterest in Course

Author	Bittner	Bittner	Kennan	Fairing	James & Wedemeyer	Hartsell	Sloan	Sloan
Year	1933	1933	1940	1950	1959	1964[d]	1966	1966
Number of subjects	324[a]	324[a]	167[b]	248[a]	55		135[a]	135[a]
Question	Why dropped course	Specific criticism	Why dropped course	Why dropped course	Why dropped course	Why dis-interested	Why dropped course	Why dis-interested
Course unsatisfactory	13[c]		.39	64	3[c]			
Work boring or tedious	14	12					12	14
Too difficult	16	52			6		7	15
Unsatisfactory instructor	10	3				√	2	13
Poorly organized		15				√		
Lack of human contact		4					4	14
Not practical	2							
Other	11	39					3	
Subtotal	66	125	39	64			38	56
Change of plan	135[c]		27	64[c]	9[c]		7	5
Rescheduled to residence work				33	5		3	
Entered Armed Forces								1
Change in vocation	20							
Course no longer needed	34			21			2	
Other	1							
Subtotal	190		27	1·18			12	6

(Table 3, continued)

Author	Bittner	Bittner	Kennan	Fairing	James & Wedemeyer	Hartsell	Sloan	Sloan
Year	1933	1933	1940	1950	1959	1964[d]	1966	1966
Number of subjects	324[a]	324[a]	167[b]	248[a]	55	135[a]	135[a]	135[a]
Question	Why dropped course	Specific criticism	Why dropped course	Why dropped course	Why dropped course	Why dis-interested	Why dropped course	Why dis-interested
Miscellaneous responses								
Illness, death, moved	56		7	41	8		9	3
Not enough time	117	31	24	120	18	✓	113	73
No library facilities or other necessary materials		6	21					
Financial problems	1		8				3	7
Never intended to finish	4						1	
Other	9		19	7	3		5	9
No response					2			19
TOTAL	443	162	145	350	55		171	173

[a] A student could give more than one response.

[b] Twenty-two of these 167 students claimed they were still studying after three years.

[c] This number does not include those in the subcategories below.

[d] Data were gathered in 1964.

complete a much larger portion of their courses than persons who pay on the installment plan. Persons who are more or less supervised by public school administrators or teachers are also more likely to be persistent in their work than others. However, according to Kennan, sending progress reports to employers upon request of the enrollee has little effect on completion. The quality of marks given by the correspondence instructor has a significant effect on the continuance of enrollee interest in study, but course length does not. Finally, although courses range in length from two to over two hundred lessons, Kennan found only a slight relationship between length of course and persistence of study.

Spencer (1965) examined 3,303 correspondence-course completions at the Correspondence Instruction Department of Pennsylvania State University during the period of July 1, 1962, through June 30, 1963. He was interested in studying the relationship to completion of some of the personal factors described above combined with the course factor of number of credits. He found that 91.7 percent of all college-credit completions were in the 3-credit courses, and 71.1 percent of all noncredit completions were in 2-unit courses. He feels that all correspondence courses should be of these two lengths. Men constituted 72.8 percent of all completions in the 3-credit courses, and 99.5 percent of all completions in the 2-unit courses. The mean completion time in months was not proportional to the number of credits a course provided. Men and women who had higher educational levels earned higher grades in 3-unit courses, but the educational level of students completing 2-unit courses had no effect on their grades. Older women in the 3-credit courses earned higher grades, but this was not true for men. Women completing 3-credit courses have a slightly higher educational level, are slightly older, take less time, and earn higher grades than men. Men completing both 3-credit and 2-unit courses used more time to complete courses in which they earned lower grades. More time for lower grades did not hold true for women in the 3-credit courses.

Student Profiles

Profiles for correspondence students have been developed including such characteristics as age, sex,

occupation, educational level, geography, opinions about correspondence courses, and popular subject areas.

Age. Kempfer (1973) presents the following two age distributions (Figures 2 and 3), one from Noffsinger's 1926 data and one from his own 1956 data, which show that age distrubution has changed remarkably little over the years. The median correspondent student age in 1956 was 26.5 years, and in 1926 it was 26 years. Other studies support these figures. Rowbotham (1965) found the heaviest enrollment of students in the University of California Extension Division (26 percent of the sample) occurred in the 21- to 25-year category. In 1967, the median age of a sample of 340 people taking home-study electronics training was 25.9 years; the largest group (35.2 percent of the total) was 18 through 24 years of age, and the second largest group (32.0 percent of the total) was 25 through 34 years of age (Home Study Review, 1967). Donehower (1968) found 33.15 percent of his sample of Nevada University students were 20 through 24 years of age and 16 percent (the second largest group) were 25 through 29 years of age. Clark (1966) constructed a student profile of the student body of the International Correspondence School based on a statistical study of the more than 70,000 students who enrolled with I.C.S. during 1965. Twenty-nine percent of the students fell into the 20- through 24-year age range; 56 percent were older than 24 years, and 39 percent were younger than 20 years. The age spread of students differed significantly for men and women. Only 8 percent of the men were younger than 20 years, but 27 percent of the women were under 20. Fifty-three percent of the men were in the 20- through 29-year age bracket, while only 40 percent of the women fell within this age group.

Sex. Most reports find a greater number of men than women enrolled in correspondence courses. Rossi and Johnstone (1965), in their large survey of adult correspondence students, found predominantly men taking correspondence courses. Clark (1966) found a much higher percentage (91 percent) of males enrolled in I.C.S. schools than women, but he notes that there is probably a higher proportion of women in the entire home-study field than the figures indicate, because many students are enrolled in high school, business, art, and writing courses, which are very popular with women. There was a
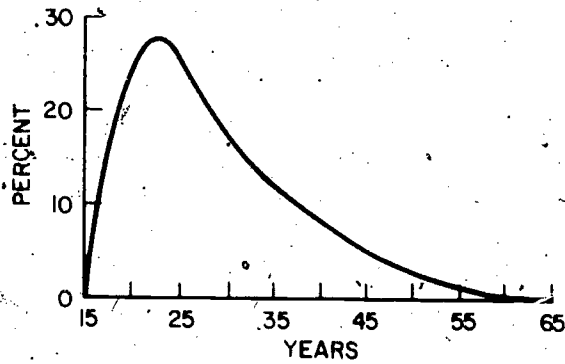
Figure 2. Age distribution of private home-study
students, 1926 (Kempfer, 1973).
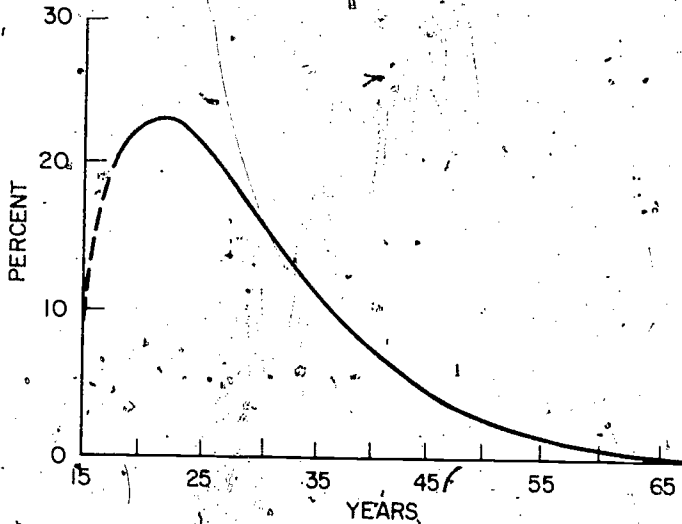
Figure 3. Age distribution of private home-study
students, 1956 (Kempfer, 1973).

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slightly higher proportion of females (54.7 percent) in Donehower's (1968) sample, but only 23 percent of Kempfer's (1973) sample were females. Two reports from the University of California (MacKenzie et al., 1968; Rowbotham, 1965) indicate that sex and age must be considered together. Rowbotham found that up to and including age 35, there are more men than women; after age 35, there are more women. Similarly, MacKenzie reported that 54 percent of the students under age 35 are male, and beyond that age female students outnumber men.

Occupation. Noffsinger (1926) found that most correspondence students came from the middle and lower-middle economic groups, and most of them came from business (34.4 percent) and industry (22.9 percent). Many were in the trades and industries or were semiskilled workers aspiring to acquire the skills necessary to enter the skilled trades and business. More recent studies show a different picture. Clark (1966) writes that, as technical needs changed, the bulk of the student body shifted from unskilled workers to skilled workers, and later from skilled workers in the blue-collar group to white-collar workers. In 1965, 30 percent of his large sample of I.C.S. students were employed in professional and managerial, sales, and clerical and service occupations. Ball et al. (1966) found that the three largest occupational categories in his sample of University of Wisconsin correspondence students were students with no other position (31.3 percent), nonprofessionals (30.4 percent), and teachers (18.9 percent); 27.6 percent of the sample were using correspondence to supplement day courses, and 29.2 percent were using correspondence to continue their university education while working at other occupations. The six largest groups in Fairbanks' (1968) sample of 1,040 Oregon State correspondence students were teachers, college students with no other position, high school students, others studying high school courses, armed forces students, and homemakers. Kempfer (1973) presents the following table (Table 4) comparing the occupational distribution of home-study students in 1926 and 1956. His figures do not show the trend of a shift toward more professionals indicated by the preceding studies.

Education. Noffsinger (1926) found that 61 percent of his sample had at least a high school education; 46

Table 4

Occupational Distribution of Private Home Study Students
as Reported by Two Researchers (Kempfer, 1973)

Noffsinger (1926)		Kempfer (1956)[a]	
Occupation	% of students	Occupation	% of students
Agriculture	5.0	Farmers, farm managers, foremen and laborers	3.4
Business	34.3	(Business)	(19.6)
		Clerical and kindred workers	11.5
		Sales workers	4.8
		Managers, officials, and proprietors except farm	3.3
Professions	9.3	Professional, technical, and kindred workers	7.0
Industry	22.9	(Industry)	(30.3)
		Craftsmen, foremen, and kindred workers	18.5
		Operatives and kindred workers	11.8
Unclassified	28.4	(Unclassified)	(38.9)
		Private household workers	2.1
		Service workers	8.5
		Laborers, except farm and mine	7.3
		Unknown	21.0

[a] Data gathered in 1956.

percent completed high school, 14 percent completed four years of college, and 1 percent had some graduate training. The Rossi and Johnstone (1965) survey showed that the median number of years of schooling among adult correspondence students was 12.2, which was identical to that for the total sample of adult participants. Participants from the lowest and highest educational brackets use the correspondence method less than those from the middle range of the educational continuum. In Rowbotham's (1965) sample, 42 percent of the enrollees had some college training, while 35 percent held a bachelor's degree or better. Twenty-five percent had been previously enrolled in other correspondence courses. Clark (1966) found that 68 percent of his I.C.S. sample had at least a high school education, a figure which had increased from 50 percent in 1955; similarly the number of students with some college training increased from 10 percent in 1955 to 20 percent in 1965. In Ball's (Ball et al., 1966) sample, 35.5 percent had three to four years of college, while 20.8 percent were using correspondence courses to extend their education past high school.

Geography. Noffsinger (1926) reported that the most popular locations for correspondence study were communities with populations from 2,500 to 100,000, where there was a degree of competition in semiskilled vocations but where the community was not large enough economically to provide agencies for this kind of training. Forty years later Rossi and Johnstone (1965) arrived at the same general conclusions. They found that adult learners from small to medium-sized communities were more likely to pursue correspondence study than their urban counterparts. Forty-four percent of adult correspondence students live in areas with populations under 50,000, while only 29 percent of all adult learners live in similar areas. The results support the suggestion that correspondence instruction is useful to those geographically isolated from resident learning. Clark (1966), however, argues that the notion that most private home-study students are located in rural or small-town areas--remote from other educational facilities--was not borne out by his profile study of I.C.S. students. Instead, the distribution of his sample paralleled population density almost exactly; for example, the three largest states in terms of

popu'`tion, California, New York, and Pennsylvania, also had 'argest I.C.S. student population.

.ct areas. Schwi.1 (1929) surveyed correspondence students at the University of Colorado; in 1929 the courses most often selected were freshman- or sophomore-level courses with education and English being the most popular subject areas. Smith (1935) found advanced English composition, applied English grammar, and elementary English composition popular at all grade levels; advanced English composition held first or second place in all but two of the age groups, and applied English was only slightly less popular. The following chart (Figure 4) summarizes data of I.C.S. student enrollment by general subject area (Clark, 1966). Clark relates the chart to home study in general in 1966 as follows. The largest percentages of I.C.S. students were enrolled in business and high school courses, and these were certainly two of the most popular areas of study throughout industry. (In fact, several large private

ENROLLMENTS BY SUBJECT
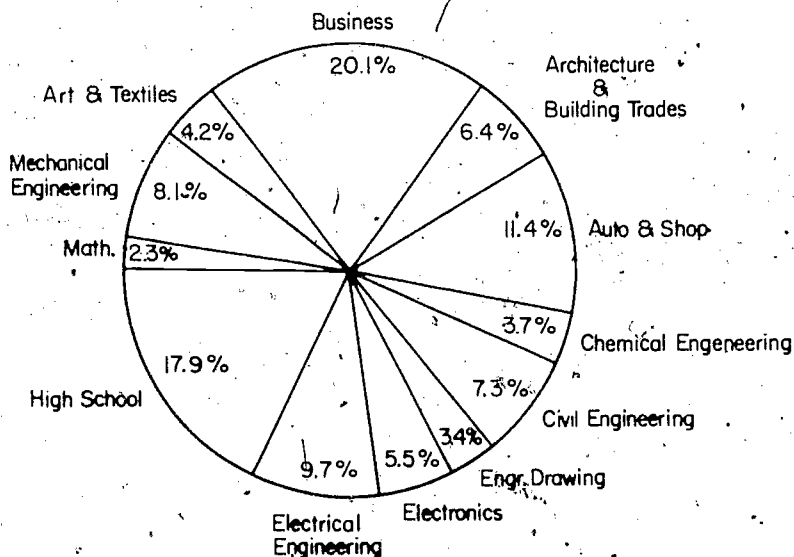
Figure 4. Enrollments by subject (Clark, 1966).

home-study schools offered only these areas of study or emphasized them in their promotion.) However, more I.C.S. students (32.2 percent) were enrolled in, engineering or related programs than in any other single field of endeavor, and this was not representative of the field. Most of the other correspondence schools did not offer engineering courses, and those that did offer such courses enrolled relatively few students in them. Two other subject areas--art and electronics--deserve special explanation because the chart does not accurately reflect the popularity of the fields. Many students were enrolled in electronics and art courses; most of the largest home-study schools taught electronics, and some offered electronics courses exclusively. Also, several schools, including one of the three largest, taught art. Clark concluded that most private home-study students at the time of his survey were studying in the following fields: business, high school, electronics, engineering, technical and trade areas, and art. The remaining students were studying in special interest fields.

Reasons for taking correspondence courses. Fairbanks (1968) questioned Oregon State University students about their reasons for taking correspondence courses and their attitude toward them. The majority felt that the role of correspondence study was to provide diploma and degree courses to which one would otherwise lack access; most had favorable attitudes toward correspondence study. Kempfer (1973) correspondingly reported that an analysis of student profiles showed that the greatest number of enrollees wanted to get ahead in the fields in which they were already working; they were using home study for personal advancement. Seventy-one percent were taking vocational courses, 14.9 percent were taking academic courses, 11.1 percent were taking courses in religion, and 2.7 percent were taking recreation and avocational courses.

Interrelations. Donehower (1968) reported some interesting findings concerning the relation of some of the above characteristics of correspondence students to grades. Grade-point averages increase with level of education. They also increase with age until age 60 when they begin to decline. There was no correlation between sex and grade-point average.

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Rossi and Johnstone (1965) compared correspondence
students in general in the three tables (Tables 5, 6, and
7) shown below. Figures are given for those persons
participating specifically in correspondence instruction
(correspondence students); all those participating in any
kind of study program, including correspondence study (all
students); and all those interviewed, both students and
nonstudents (survey sample). For most categories,
correspondence students are comparable to students in
general. The notable exceptions are that there is a much
higher proportion of men in the correspondence sample,
there are more craftsmen and foremen and fewer
professional and technical workers in the correspondence
sample, and there are fewer correspondence students in
large cities and more in small cities and rural areas.

Table 5

Adult Student Population Distribution
(Rossi & Johnstone, 1965)

Area	Correspondence students[a] %	All students[b] %	Survey sample[c] %
Large city (over 2,000,000)	16	25	23
Medium-sized city (50,000-2,000,000)	40	45	40
Small city (10,000-50,000)	22	13	14
Rural area or small town (under 10,000)	22	16	23

[a]Base: 345

[b]Base: 4,710

[c]Base: 23,840

Table 6

Profile of the Typical Adult Student
(Rossi & Johnstone, 1965)

Student characteristic	Correspondence students	All students	Survey sample
Sex			
Male	75%	50%	47%
Female	25%	50%	53%
Age, years			
Median	33.2	36.5	42.8
(Base)	(344)	(4,678)	(23,677)
Years of formal education			
Median	12.2	12.2	11.5
(Base)	(345)	(4,681)	(23,299)
Family income			
Median	$5,880	$6,600	$5,410
(Base)	(344)	(4,637)	(23,123)

LeMaire (1964) compared males taking correspondence
courses to males in the United States population in
general and found that male enrollees did not resemble the
total male population. Some differences are, for example,
the older the persons were, the less apt they were to
enroll in correspondence courses; there were twice as many
high school graduates who enrolled for correspondence
courses as would be expected on the basis of the number of
male high school graduates in the total male population;
there were nearly twice as many persons who had attended
college who enrolled for courses as would be expected on
the basis of the total male population; and there were
fewer enrollees in cities with populations of 25,000 or
less and in cities of 500,000 or more than would be
expected on the basis of the total population.

Paisley, Hall, Mick, and Paisley (1972) reported some
differences between adult education students and the
population in general. Adult education participants are
on the average more than six years younger than the
"average" American adult. Sex, marital status, race, and
religion do not appear to distinguish the adult education

Table 7

Occupational Distribution of Adult Students in the Labor Force (Rossi & Johnstone, 1965)

Occupation	Correspondence students[a] %	All students[b] %	Survey sample[c] %
Craftsmen and foremen	36	18	16
Professional and technical workers	18	23	12
Managers, officials, and proprietors	11	12	11
Clerical and office workers	10	15	13
Operatives	10	10	17
Other	15	22	31

[a] Base: 295

[b] Base: 3,321

[c] Base: 14,265

participant from the rest of the adult population. However, 'the well-educated and well-employed groups are overrepresented. Participants are twice as likely as nonparticipants to have attended college and to hold professional or technical jobs.

Correspondence Work versus Residence Work

Not surprisingly, much interest has been shown in comparing student achievement via correspondence with student achievement via residence work. Most studies of this type compare final grades of students taking a course by correspondence with those of matched students taking the same course in residence. Others use standardized tests instead of final exams, and some have compared other

measures of success upon completion of the course or a
series of courses. We found one study that used students
who had taken several courses by correspondence and
several in residence and compared their overall grade-
point average in each method. Most of the work indicates
that students who take courses by correspondence achieve
at least as much as students who take courses in
residence.

Childs (1971), considering the evidence of several
studies, concluded that students enrolled for instruction
by correspondence study achieve academically as well as
students enrolled for instruction by other methods, and
that when a difference does exist, it is likely to favor
the correspondence study method. Dubin and Faveggia
(1968) made an extensive survey of the literature
comparing various methods of study. They had to conclude
that most studies showed no differences in final
examination scores obtained through supervised independent
study and any of the following methods: face-to-face
instruction, lecturing, discussion method, and lecture-
discussion method.

The oldest comparative study we found was one cited
by Bittner and Mallory (1933); it was conducted in the
first semester of the 1930-1931 school year at the
University of Minnesota. The professor of a course in
educational psychology taught that subject to 20 students
in the classroom and to 35 students through
correspondence. He found that the correspondence group
had a slightly higher average on the final examination.
About the same time Feig (1932) made a comparison of
academic achievement and showed that correspondence
students performed better than students having the same
course in class with the same instructor. Meierhenry
(1945) used standardized examinations to compare the
vocational education of high school students who studied
by correspondence to those who studied in class, but he
found no differences in performance.

A much larger study was conducted by Childs for her
Ph.D. dissertation (1949). She chose 14 subject areas and
compared the people who completed these courses by
supervised correspondence with people who took the same
courses in five Nebraska schools chosen at random. When
the subjects were matched for IQ and chronological
age, the mean scores of the correspondence students on

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achievement tests exceeded the mean scores of the classroom pupils in seven subjects; and there was no significant difference between the mean scores in three subjects. When the subjects were matched on IQ and G.E.D. (General Educational Development) scores, the mean score of the correspondence students exceeded the mean score of the classroom students significantly in one course and not significantly in two courses. According to Childs, the study indicates that the achievement of supervised correspondence students is definitely on a par with regular classroom students.

Newman and Highland (1956) showed that 64 airmen who had available only printed materials without instructor assistance could learn as much as three other groups of 64 airmen who studied (a) with especially competent instructors, (b) with tape recordings and workbooks, or (c) with tape recordings and slides. Farnam (1957) found that 66 university extension course students were significantly superior to 82 resident students in vocabulary test scores and on scores measuring comprehension level. Dysinger and Bridgeman (1957), on the other hand, found no significant differences between home and in-class students studying introductory psychology at the University of Wisconsin.

Crissy (1966) examined the effectiveness of training naval officers by correspondence. He used a three-assignment course called "Security of Classified Matter," which was chosen because it contained subject matter vital to Naval interests and because the material was not likely to have been learned in civilian experience. A test was given immediately upon completion of the course and again four months later. He found that the correspondence group had a significant gain in knowledge and that four months after completion of the course they still retained most of what they had learned. The knowledge of officers who had completed the course was compared with that of officers who had had recent security experience. Officers actually occupying security billets scored no higher than officers who had just completed the course; officers who had recently occupied security billets scored no higher than officers who completed the course four months previously. Officers who had the course plus experience produced significantly higher average test scores than those who had had only training or only experience.

Glatter and Wedell (1971, p. 48) draw the following conclusions based on their survey of correspondence courses in Britain: "It seems therefore that when it comes to taking tests and examinations, students taught by correspondence do as well as and sometimes better than those taught orally. They may also perform better in subsequent oral education if they have been successful in their correspondence studies. We are here, of course, talking about students who have actually got to the stage of sitting the examination or taking the test. Very few of the studies referred to so far even mention dropout, and only one gives the wastage rate from the courses in question."

We located three studies that examine the future success of correspondence students. Childs (1956) made up an experimental group of 79 students who had taken mathematics by supervised correspondence study in high school and had entered the University of Nebraska and registered for mathematics with no intervening training in this field. Her control group consisted of 79 matched students chosen from the same college mathmatics class. Final grades were used as the measure of achievement. Her work indicated that pupils who have studied mathematics by correspondence in high school are on the average likely to have more success in future mathematics courses than those students of comparable ability who have not had this experience. Kennelly (1962, 1965, 1967) conducted two studies to see how well graduates of a correspondence high school perform in college; both studies involved graduates of the American School, a correspondence high school. He asked college registrars to rate the American School graduates as above average, average, or below average. For the second study he also verified that the colleges the graduates were attending did not on the whole have lower academic standards. In 1962, registrars gave ratings of average or above to 81 percent of the American School group; figures for the college population in general indicate that 72 percent perform above average or better. In 1967, 84 percent of the correspondence school graduates received ratings of average or above. Kennelly feels that the evidence is compelling that correspondence school graduates are not only adequately prepared for college, but tend to perform as well as, or better than, their peers.

Thordarson (1965) obtained similar results in a comparison of 400 students attending rural schools studying freshman high-school subjects, and students studying the same subjects in regular high schools. The status of both the correspondence freshmen and regular high schoool freshmen at the end of the five-and-one-half-month experimental period compared favorably with the status of freshmen throughout the nation in all of the areas measured. This was especially true of the fields of natural science and mathematical fundamentals, in which the initial status of both groups was above that reached by freshmen in other states by the middle of the year. The progress of correspondence freshmen in social studies during the exprimental period surpassed that of regular high school freshmen during the same period; the difference was significant at the 1 percent level.

The following studies illustrate other kinds of comparisons of correspondence study to residence study. Larson (1932) examined a group of 56 students who had taken both residence and correspondence work at the university level; 72 percent of the students attained higher grades in correspondence courses than in residence courses. Corey (1934) compared test results of college freshmen listening to a lecture or reading identically worded materials for the same length of time. For immediate recall, the reading group was significantly superior to the lecture group, and, for the recall test 14 days later, the reading group was again superior but not significantly so. Milton (1962) studied long-term differences of in-class exposure to a psychology course versus out-of-class self-study with a typed version of the lecture. He found no differences in dropout rates from college and no differences in the number of students who immediately took the second half of the course, but slight differences in favor of the out-of-class group to enroll in upper-division psychology courses. Spencer (1965) found that grades earned by correspondence-study degree students were higher than those earned by resident students at Pennsylvania State during the 1963 spring term. Johnstone and Rivers (1965) questioned people about whether they would prefer to take a course they were very interested in by correspondence or classroom. Older people were more likely than younger ones to prefer correspondence; in addition, the lower a person's

socioeconomic status, the more likely he was to favor correspondence. The latter finding was especially true among women.

Method of Presentation

Several studies have searched for ways of improving correspondence courses by various changes or additions. While the change most often studied is the addition of programmed materials, the effect of programmed materials on learning is as yet unclear. Kempfer (1965) sent questionnaires to 136 universities, private correspondence schools, and federal agencies to see to what extent they were using programmed instruction; 120 replied, and 23 said they were using programmed instruction. Based on many statistics compiled from these 23 replies, Kempfer concluded that a modified form of programmed instruction offered some real advantages for correspondence instruction; a true linear format was too bulky and expensive for general use but could be useful for some purposes. Provisions for frequent student response to specific stimuli along with immediate feedback appeared to aid learning and was liked by students.

Childs (1966) summarized work comparing correspondence courses with and without programmed instruction and concluded that, while some evidence suggests that students in programmed correspondence study complete the courses in less time, the achievement of the students is approximately the same under both methods. She added that if there is a learning advantage, it rests with the regular correspondence study method.

Walsh (1962, 1963) conducted two experiments to test the importance of a programmed learning device, the PL-100, in a correspondence study situation. In each case, an experimental group used the PL-100 along with their regular correspondence course materials and a control group used only the regular materials. In the first experiment the two groups were similar in achievement, rate of progress, and nonstart and dropout rates, but the reactions of students were overwhelmingly in favor of the PL-100. In the second experiment, the progress rate was greater for the experimental than for the control group, and again the responses were overwhelmingly in favor of the PL-100. Achievement rates, nonstart rates, and

dropout-rates were again similar. Schoen (1964) reported a mixed reaction by students to programmed instruction and a preference by a slight majority for conventional correspondence study. Tohtz and Long (1963) found no differences in achievement between experimental and control groups of freshmen taking expository writing via programmed instruction or conventional homework assignments. Sjogren (1964) compared three methods for teaching ninth grade English and algebra, namely, programmed materials only, regular correspondence materials, and regular correspondence with certain parts programmed. No significant differences were found in either subject between the achievement test means or dropout rates. Algebra students using all programmed materials completed the course in considerably less time, but there were no significant differences in mean completion times in English.

Kennelly (1965) compared achievement and learning time of students using traditional correspondence work with those of students using programmed materials. He found that the mean performance of students using conventional correspondence materials as measured by a standardized achievement test was superior in four out of five tests of significance. The mean learning time of students using programmed instruction was faster in three out of five tests of significance.

Stewart (1965) cites two studies favorable to the use of programmed materials. In the Bronx Community College of the City University of New York, where the normal attrition rate of a physics course was higher than 30 percent, the attrition dropped to less than 5 percent after the introduction of programmed instructional materials. U.S. Air Force personnel report that in using more than 100 programmed courses, Air Force students have saved 33 percent in learning time.

Friedman (1965) learned some student reactions to programmed courses by using two groups, one taking a course via standard correspondence materials and one taking the same course with programmed materials. Midway through the course he sent to each member of the standard group a programmed lesson corresponding to the lesson they were currently studying, and to each member of the programmed group a standard lesson corresponding to the programmed lesson they were studying. He found that when

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a student is permitted to inspect the lessons, he will more often choose the programmed type, but that students often feel that they do not get as complete or comprehensive a course using programmed materials.

Other research has suggested different kinds of changes that might be made in correspondence courses to improve learning. As early as 1929, Reinoehl (1929) looked at number and length of periods of inactivity in relation to performance in correspondence courses. He found that the quality of work was affected unfavorably by periods of inactivity, and the quality of work tended to decrease when the number of months to complete it became excessive. Long lapses of inactivity occurred in the students who dropped their courses before completing them. Long courses tended to be pursued more rapidly than short courses; 24 assignments made a satisfactory course length for most students.

DiVesta (1954) compared three ways of presenting written material and two kinds of examinations. The three kinds of writing styles were formal, informal, and division into units similar to those used in programmed courses. The two kinds of tests were closed book, and open book in which the students received a copy of the examination at the beginning of the course. More subjects in the open-book-examination groups finished the course than subjects in the closed-book-examination groups. There were no significant differences in achievement in subjects in the three types of learning groups, but subjects taking the open-book examination made higher achievement gains than subjects taking the closed-book examination. The retention test, closed book for everyone, was given 30 days after receipt of the final examination. Learning style made no difference in retention of the student's achievement level, but the closed-book-examination groups had significantly lower retention scores than the open-book examination groups. The subjects who took the closed book examination maintained their original achievement level on the retention test, while those who took the open book examination had significant losses over the 30-day period.

Montross (1956) and Wilson (1968) experimented with ways of making correspondence courses more personal. Montross compared an experimental group who received standard correspondence materials plus special letters and

visits from the staff with a control group who received only the standard materials. The experimental group completed significantly more assignments per student per month and had a significantly greater percentage of students returning assignments each month than the control group. The experimental group completed 24 percent more assignments overall, had more total completions, and had fewer students not beginning than the control group, although these differences were not significant. Most importantly, the experimental group made significantly greater achievement gains and had a more positive attitude toward correspondence courses. Wilson's study involved two experimental groups and a control group; for one experimental group the lessons were graded but not returned, and for the other group there was feedback via telephone. The control group received only the standard correspondence materials. In terms of numbers of students submitting lesson one, completion rates, and time required for completion, the performance of the experimental groups was better than that of the correspondence subjects. Students in the experimental groups were more likely to start the course, more likely to complete it, and more likely to complete it in less time. However, of those who did complete the course, students in the traditional correspondence study group and those in the experimental group without voice contact received higher grades and increased their posttest scores over their pretest scores by a greater, but not significantly greater, margin than the other experimental group. In line with this, Childs (1966) concluded from her survey of studies on teaching by correspondence that the nature of the response made by the teacher who evaluates student lessons is not in itself important, but that what the syllabus or teacher can do to elicit student responses in the form of either tests or written assignments does increase student interest and achievement.

Conclusions

First, the large numbers of students that have been enrolled in correspondence courses for a wide variety of subjects throughout this century provide adequate testimony to the need for home-based education. What is also important in assessing this evidence of need is that

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the large numbers of students are not concentrated in any single topic but range over the widest possible diversity of student groups, from adults with very specific vocational education aims to adults seeking professional or cultural enrichment without highly specific career goals.

Second, the extensive data surveyed also make clear that the main features of this traditional form of home-based instruction have quite constant characteristics in terms of dropout rates in given areas of instruction, and it seems doubtful that substantial differences in effectiveness can be brought about by methods that stay within the traditional framework of correspondence instruction.

Third, the continued increase in the absolute number of students enrolled for correspondence courses in the United States, coupled with the evidence that this method of instruction is economically relatively cheap, leads to the conclusion that correspondence instruction will continue to have a robust future for the rest of this century. We consider later the possibilities of enhancing it by the use of recent technologies of instruction.

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Compares student reactions to correspondence courses with programmed instruction with reactions to conventional correspondence instruction for an introductory course in electronics. Three hundred-eight students returned the questionnaire.

Glatter, R., & Wedell, E. G. Study by correspondence. London: Longman Group Limited, 1971.

An extensive survey of correspondence education in Britain plus chapters on correspondence in other countries.

Hartsell, C. Correspondence dropouts. Why? In
D. E. Mathieson, Correspondence study: A review of
research and development literature. New York:
Syracuse University, 1971.

A questionnaire was sent to nonstart correspondence
students at the University of Tennessee. Thirty-two
percent responded.

Home Study Review, Student and non-student attitudes
toward home-study electronics training. The Home Study
Review, 1967, 8, 14-17.

In a survey conducted by Ziff-Davis Publishing Company,
questionnaires concerning attitudes toward home study
were sent to 3,000 readers of electronics magazines.
Three hundred forty responded.

Hughes, C. R. The influence of some selected factors upon
the completion of correspondence study courses,
Unpublished Ed.D. thesis, University of Florida, 1955.

A questionnaire was sent to 441 correspondence students
at the University of Florida, 249 replied.

James, B. J., & Wedemeyers C. A. Completion of university
correspondence courses by adults. Junior Higher.
Education, 1959, 30, 87-93.

Interviewed or received information about 55 adults and
125 high school students taking correspondence courses
through the University of Wisconsin's Extension
Division.

Johnstone, J. W. C., & Rivers, R. J. Volunteers for
learning. Chicago: Adline Publishing Company, 1965.

A monograph concerning many aspects of adult education
including the results of a questionnaire survey of
preferences for correspondence or residence courses.

Kempfer, H. A.   Programmed instruction in correspondence
    courses: Report of a survey. The Home Study Review,
    1965, 6, 33-41.

    Questionnaires were sent to 136, universities, private
    correspondence schools, and federal agencies to learn
    to what extent they were using programmed instruction.
    One hundred twenty institutions replied.

Kempier, H. A.   Private home study schools in Illinois.
    State of Illinois Advisory Council   on Vocational
    Education. June, 1973.

    A survey of correspondence schools in the United States
    with a special focus on Illinois. Some data . from the
    Home Study Council's 1970 survey are included.

Kennan, R. B.   The private correspondence school enrollee.
    New York: Teachers College, Columbia University, 1940.

    A survey of private schools in the United States,
    particularly the International Correspondence Schools
    and Women's Institute.

Kennelly, T. E.   Can graduates of a correspondence high
    school   succeed in college.   The Home Study Review,
    1962, 2, 5-8.

    Questionnaires were sent to college registrars to find
    out how well graduates of the American School (a
    correspondence high school) performed in college.
    Questionnaires   were   returned   from   365 colleges
    regarding 568 students.

Kennelly, T. E.   A study comparing the effectiveness of
    programmed learning and correspondence instruction. In
    R. S. Sims (Ed.),   Research in the correspondence
    instruction field. Madison: United   States Armed
    Forces Institute, 1965.

    A comparison of correspondence courses through
    programmed instruction with traditional correspondence
    courses at the American School (a correspondence high
    school).

Kennelly, T. E. College achievement of home study high
    school graduates. The Home Study Review, 1967, 8, 5-9.

    A follow-up to the 1962 study; this time registrars
    from 620 institutions responded regarding 1,191
    students.

Larson, E. L. The comparative quality of work done by
    students in residence and in correspondence work.
    Journal of Education Research, 1932, 25, 105-109.

    Compares the grades received by 56 students who had
    taken both residence and correspondence work at the
    university level.

LeMaire, H. J. Social and economic factors and selection
    of home study courses by older males. Home Study
    Review, 1964, 5, 25-33.

    A study to see if there are any significant differences
    between characteristics of the United States male
    population and those of male correspondence school
    enrollees. Information was gathered from records of
    students who had enrolled for courses at the
    International Correspondence Schools during 1961.

MacKenzie, O., Christensens, E. L., & Rigby, P. H.
    Correspondence instruction in the United States. New
    York: McGraw-Hill, 1968.

    An extensive study conducted by the Correspondence
    Education Research Project (C.E.R.P.) to provide a
    history of correspondence instruction, a survey of
    current problems and practices, an analysis and
    evaluation of correspondence instruction as a method,
    and some predictions about the future.

McCauley, J. S. Apprentice dropouts in the construction
    industry. The Home Study Review, 1962, 2, 27-33.

    A survey of apprentice completions in building trades
    from 1952-1960.

Meierhenry, W. C. A vocational education program for the
    small high school utilizing supervised correspondence
    study and work experience. Unpublished dissertation,
    Teachers College, University of Nebraska, 1945.

    An experiment concerning the use of supervised
    correspondence for high school vocational subjects.

Milton, O. Two-year follow-up: Objective data after
    learning without class attendence. Psychological
    Reports, 1962, 11, 833-840.

    A study of long-term differences of in-class exposure
    to a first-year psychology course compared to exposure
    through a correspondence course.

Montross, H. W. An experimental study of the
    effectiveness of field assistance in attitudes and
    course achievements of corespondence study students.
    Journal of Education Research, 1956, 50, 161-173.

    Tested the effects of several ways of making
    correspondence courses more personal. Two groups of 44
    students were selected from those who registered in the
    University of Wisconsin Extension Division from January
    1953 to February 1954.

National Home Study Council. Correspondence education
    survey, The Home Study Review, 1966, 7, 24.

    A survey of United States correspondence schools plus
    63 correspondence schools in 29 foreign countries.

National Home Study Council. 1966 Correspondence
    Education Survey. The Council, 1967.

    A survey of correspondence education in 1966.

Newman, S. E., & Highland, R. W. The effectiveness of
    four instructional methods at different stages of a
    course. Lackland Air Force Base: Air Force Personnel
    and Training Research Center, June, 1956.

Compared four instructional methods with four groups of 64 airmen each.

Noffsinger, J. S. Correspondence schools, lyceums, and chautauquas. New York: Macmillan, 1926.

A large survey of private home-study students.

Paisley, M. B., Hall, D. G., Mick, C. K., & Paisley, W. J. Reaching adults for lifelong learning. Stanford University: Institute for Communications Research, August, 1972.

An intensive study of 949 institutions, including large public school systems, junior colleges, four-year colleges, and universities, concerning two major questions: (1) In what ways are lifelong learning programs being promoted imaginatively and effectively? (2) Can exemplary practice be adopted or adapted by other programs for more effective outreach?

Pfeiffer, J. W., & Sabers, D. Attrition and achievement in correspondence study. National Home Study Council News, Supplement; February, 1970.

A study of correspondence students who do not complete their courses.

Reinoehl, C. M. Standardizing correspondence instruction. Journal of Education Research, 1929, 20, 260-267.

A study of the relation of number and length of periods of inactivity to achievement and completion. Subjects were 116 correspondence students at the University of Arkansas; 2,382 reports on their completed assignments were reviewed.

Ritter, E. L, A status study covering 10 years of correspondence study (1954-1963) at the State College of Iowa. In R. S. Sims (Ed.), Research in the correspondence instruction field. Madison: United States Armed Forces Institute, 1965.

A study of 10 years of correspondence study at the State College of Iowa, Cedar Falls, Iowa.

Rossi, P. H., & Johnstone, J. W. Social aspects of correspondence education (a background paper for Correspondence Education Research Project, Pennsylvania State University). Chicago: National Opinion Research Center, 1965.

A comprehensive study of adult, nonmilitary correspondence students in 1961-62.

Rowbotham, A. A profile study of the correspondence student. In R. S. Sims (Ed.), Research in the correspondence instruction field. Madison: United States Armed Forces Institute, 1965.

A survey of students in the University of California Extension Division.

Schoen, J. R. Programmed instruction in military home study courses. The Home Study Review, 1964, 5, 22-24.

A study of the use of programmed instruction in military home study programs--particularly student reactions to programmed instruction. Two courses were used; 416 students completed one, and 138 completed the other.

Schwin, M. L. Analysis of correspondence course grades in the University of Colorado. Unpublished M.S. thesis, University of Colorado, 1929.

A survey of correspondence courses taken by students of the University of Colorado using data from registration forms and correspondence instruction records.

Sjogren, D. D. Programmed materials in high school correspondence courses. Research report of Cooperative Research Project No. 1534, University of Nebraska, 1964.

Compares three kinds of correspondence instruction for teaching ninth-grade English and algebra; one included

the use of programmed materials. There were 191 students in the English groups and 186 in the algebra groups.

Sloan, D. Survey study of university dropouts and cancellations. The Home Study Review, 1966, 7, 9-16.

A questionnaire study of 135 University of Kentucky correspondence dropouts.

Smith, G. B. Home study in adult education--Purposes and conditions affecting the nature and extent of participation of adults in courses in the home-study department of Columbia University. Unpublished Ed.D. thesis, Teachers College, Columbia University, 1935.

A survey of adult participation in home-study courses at Columbia University; the sample contained 5,700 students who registered in correspondence courses from 1925 to 1932.

Spencer, O. Factors associated with persons who complete correspondence courses. The Home Study Review, 1965, 5, 1076.

A study of all (3,303) college-credit and noncredit correspondence completions at Pennsylvania State University during the period of July 1, 1962, to June 30, 1963.

Stewart, D. L. Applications of learning systems concept to education and training courses. The Home Study Review, 1965, 6, 19-32.

Comments about applications of "learning systems" to the development of correspondence courses. Cites some studies about the use of programmed instruction in correspondence courses.

Tempest, N. Study of home completion rates, 1962-63. In R. S. Sims (Ed.), Research in the correspondence instruction field. Madison: United States Armed Forces Institute, 1965.

Study of completion rates of 2,092 University of Utah correspondence students in the 1962-63 school year.

Thordarson, T. W. Classroom versus correspondence instruction. In R. S. Sims (Ed.), Research in the correspondence instruction field. Madison: United States Armed Forces Institute, 1965.

A comparative evaluation of 400 students attending rural schools studying freshman high school subjects by supervised correspondence courses and students studying the same subjects in regular classrooms.

Tohtz, J. E., & Long, E. Out of class programmed instruction teaching compared with conventional homework assignments on expository writing in freshman English, 1963. (ERIC Document Reproduction Service No. ED 003 307)

A comparison of 273 freshmen taking expository writing by programmed instruction with others taking the same course with conventional homework assignments.

Walsh, J. E. PL-100: A programmed learning experiment of correspondence students. The Home Study Review, 1962, 3, 20-29.

A study of the importance of the PL-100 in a correspondence course in a mathematics course from the International Correspondence School. Fifteen hundred students enrolling for the course on alternate days during July and August of 1961 received a PL-100 as part of their course materials; records were kept for a control group who did not receive the PL-100.

Walsh, J. E. Adjunct programming: A technique for home study training. The Home Study Review, 1963, 4, 36-40.

Summarizes three experiments that follow the 1962 experiment; more than 5,000 International Correspondence School students were involved. An experiment involving the use of the PL-100 in a classroom under supervised conditions is also discussed.

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Wilson, R. R. The effects of selected programming--Analog
    techniques and voice-contact on completion behavior in
    correspondence instruction.   Unpublished manuscript,
    Michigan University, 1968.

    Compared the   effects of attempts   to personalize
    correspondence courses; three groups of 50 adults each
    were used.

II.   HOME-BASED COMPUTER-ASSISTED INSTRUCTION FOR

GIFTED STUDENTS

The Institute for Mathematical Studies in the Social Sciences (IMSSS) experimented with a special program of instruction for a selected number of highly gifted students in the Bay Area. Participating students, primarily in the age range of 10 to 14 years, were offered courses in mathematical logic and related parts of mathematics, including programming courses, and an introductory Russian course. The students did essentially all of the work at home on Model-33 teletypewriters that could be connected to the PDP-10 computer at IMSSS through an acoustic coupler and the home telephone. In this report we explain the program and discuss the results of the elementary logic course.

Procedure

Eight school districts in the areas surrounding Stanford University were invited to submit the names of students whose IQ as measured by the Stanford-Binet intelligence test was at least 165 and who seemed to have a wide range of outside activities; the latter condition was stipulated so we could determine how well a home-based computer-assisted instruction (CAI) curriculum would compete with other established interests. The districts were asked to include with each name a statement describing the student and indicating why he or she was being recommended for the program. Some districts did this; others submitted short autobiographies of the students, and some submitted only the test scores. From this information members of the Institute staff selected a total of 16 students; there were some from each district and an equal number of boys and girls. We made four exceptions to the criterion of having a Stanford-Binet IQ score of at least 165: Three of the children measured "superior" on the WISC but had not taken the Stanford Binet, and the fourth child measured only 132 on the Stanford-Binet but was an outstanding achiever in his district. Children who were not selected were placed on a

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waiting list.   All selected children   were in   the sixth,
seventh, or eighth grade with the exception of one girl in
the third grade and one in the fifth grade.

The program   began in the fall of 1973. By   June   of
1974, 8 children had dropped out for reasons which will be
explained later, and 3 more dropped out in the   fall.   Ten
new students were selected from the waiting list   in June,
bringing   the   total   number   of   children   in   the summer
program to 18; 2 more new students were added in the fall,
making a   total of   28 gifted children   in the   program at
some time during the experiment.

Tables 8 and 9 summarize IQ data and age data for the
participating children, and   Table 10   summarizes sibling
data.   Two facts about sibling placement of   the students

Table 8

IQ Scores

	Mean	Minimum	Maximum
Male	170.0	132	197
Female	171.0	170	177
Total	170.4	132	197

Note. Students who were measured
by WISC are not included.

Table 9

Age (in Years) at Start of Experiment

	Mean	Minimum	Maximum
Male	12.3	11.0	13.5
Female	11.9	8.5	13.25
Total	12.1	8.5	13.5

50   54

Table 10

Placement of Subjects among Siblings

	First born	Last born	Only	Other
Male	10	5	0	0
Female	2	9	0	2

are of interest. First, none of our students was an only
child, and, second, while 19 of the 28 students came from
families with more than two siblings, 17 of these were
either the oldest or the youngest child. We had only two
students who had both an older and a younger sibling.

In November of 1973, letters of invitation were sent
to the parents of each child selected for the program;
copies were sent to the cooperating school district. The
letters provided a description of the program, including
the available curricula and necessary equipment, and
indicated that there would be no cost to the family. All
families agreed to participate. Installation of teletypes
began as soon as permission was given by the parents; all
were installed by January of 1974. The students were
shown how to dial the computer at IMSSS, how to use the
terminal, and how to sign on to the elementary logic
course. With this minimal explanation all students were
able to begin their CAI work.

A meeting was held on January 14, 1974, at IMSSS for
parents and students. This was a general meeting to
answer questions about the program and the curricula and
to provide a tour of the IMSSS facilities. Parents were
encouraged not to urge their children to work on the
teletypes; instead, students were to pace themselves and
work as much or as little as they wished. The meeting was
well received and follow-up monthly meetings were planned.
However, because of the gasoline shortage, no further
meetings were held until June when the 10 new students had
been selected.

A proctor was available at IMSSS four days a week during scheduled times so students could telephone for help. Some students, who indicated they felt too shy for telephone, were called once a week by the proctor to see if they were having any problems.

The summer program was similar to the spring program. Letters of invitation and explanation were sent to the 10 new students and a meeting was held June 17 for old and new students. This time the parents were not encouraged to come.

Summer students were told that they could take a programming course, BASIC, along with the logic course by writing or telephoning IMSSS to request a BASIC manual. This left the initiative with the student: Six students requested the manual and began the BASIC course, and two finished the course by January 1, 1975.

By midsummer it was apparent that eight students-- four new students and four old students--were not working regularly toward completing the logic course. Weekly individual goals were set to encourage regular study. The students expressed approval of the goal setting but, in fact, did not change their work habits. By January 1, 1975, four of these students (two old and two new) completed the logic course, two (new students) were still working very slowly and irregularly, and two (old students) had dropped out.

Two students, who were friends attending the same school, seemed to enjoy competing with each other on the CAI curricula, and this competition apparently stimulated progress. After further inquiry, telephone lists of all participating students were mailed to the students. However, the students did not make much use of the lists, possibly because they were too shy to telephone peers they had not met.

Curriculum

The first part of the elementary logic-algebra program is basically a tutorial course in elementary logic concerned with introducing numerical and sentential variables, forming algebraic terms and sentences, and working with truth conditions of simple sentences. The logical connectives are introduced; as well as their truth analysis. Along with the introduction of each connective,

the rules of derivation appropriate to it are also presented. The student is required to make logical derivations using each of the rules, as well as to make more complex derivations combining the rules. In addition to the rules of logic, the student also learns and uses some algebraic rules. Several lessons are devoted to the concepts of validity of rules and validity of arguments.

The second part of the program is concerned with modern algebra. From a small set of axioms and rules of inference the properties of the field of rational numbers are developed. Beginning with the axioms for addition, the student proves some elementary theorems such as the cancellation law for addition. Axioms for multiplication and ordering are then introduced, and the student eventually derives as theorems the standard properties of the field. A more detailed outline of the elementary logic-algebra program and a complete list of rules and axioms taught each year can be found in Suppes, Goldberg, Kanz, Searle, and Stauffer (1971) and Suppes (1972); the early history of the elementary logic curriculum (for 1964-65) is given in Appendix 1 of Suppes, Jerman, and Brian (1968).

Basic information, including new vocabulary, dominance of connectives, strategies, and derivations involving English sentences, are presented in a multiple-choice response mode. The rules are presented one at a time followed by a few problems making one-step and then two-step use of the rule. Thereafter, derivations make regular use of the new rule and all previously given rules. For multiple-choice problems the error message WRONG, TRY AGAIN follows incorrect responses; the student continues to respond until he gives a correct answer. For derivation problems, incorrect syntax or invalid comments from the student are followed by brief explanatory messages. However, as there are often many ways of deriving a given conclusion from given premises, the computer allows any valid step, whether or not it helps reach the conclusion. Which rules to use and details of their use are matters of strategy determined by experience and ingenuity.

Other courses available to the students--the college logic course, the Russian course, and the programming courses--are not discussed in this report.

Results

Before presenting the data, we would like to give some observations of a general nature concerning student reactions to their CAI work. Three boys were, from the beginning, extremely interested in the system itself, both the hardware and the software. Two of these worked through the logic curriculum very quickly, while the third worked more slowly but regularly; these boys appeared to be more interested in completing the curriculum as a step toward learning more about the system than in the curriculum itself. Another boy was obviously enthusiastic about learning the logic material as an end in itself and worked very fast. A group of eight students (including one of the boys already mentioned) worked more slowly but regularly and without any pushing by the proctor. The remaining children required much encouragement by the proctor and, even so, worked very slowly and irregularly.

Of the 28 students, 10 asked to have their teletypes removed before they had completed the elementary logic course. All but two of these completed at least the first part of the curriculum. Five stopped at either the fifth or sixth lesson of Part 2; these lessons teach conditional proofs including the use of a working premise and the affirm-the-antecedent rule. These concepts proved to be difficult for most students and evidently were enough to push a student who was wavering into dropping. Two of the remaining three who completed the first part of the curriculum were about one-fourth of the way into the second part of the elementary logic, and the third student was a little over half way through. One student dropped out of the program as soon as he completed the elementary logic course; he was a very good (i.e., fast) summer student who felt that once school had started again in the fall he would have too much school work to begin the CAI college logic course.

When questioned about why they wished to drop the courses, two students indicated a preference for other time-consuming activities--swimming in one case and children's theater in the other; two others said they would have liked more personal contact--they liked the meetings and felt the telephone conversations with the proctor were not sufficient. The remaining students were not as specific and simply indicated a general lack of

interest. Eight of the students who requested the removal
of their teletypes had worked a little on the programming
courses but evidently were not stimulated by these either.

Tables 11, 12, and 13 show sibling data, IQ data, and
age data for the 11 students who dropped out of the
program early. Six of the 11 came from families of more
than two siblings; only one was a middle child. It is
interesting that both the student with the lowest IQ and
the student with the second highest IQ were among those
who dropped out.

Eleven students had completed the elementary logic
course as of January 1, 1975. One winter student
completed the course in 5.5 months, one completed it in 7
months, one completed it in 9.5 months, and one completed
it in 10.5 months. Of the summer students, one completed

Table 11

Placement of Subjects among Siblings for
Students Leaving the Program Early

	First born	Last born	Only	Other
Male	4	3	0	0
Female	1	2	0	1⁊

Table 12

IQ Scores for Students Leaving
the Program Early

	Mean	Minimum	Maximum
Male	166.8	132	184
Female	170.8	170	173
Total	168.3	132	184

Table 13

Age (in Years) at Start of Experiment
for Students Leaving the Program Early

	Mean	Minimum	Maximum
Male	12.1	11.0	13.3
Female	11.7	10.3	12.9
Total	12.0	10.3	13.3

the course in 1.5 months, two completed it in 2.5 months,
one completed it in 5 months, and two completed it in 6
months.

The minimum number of hours used to complete the
course was 26; this student spread the hours over a period
of 9.5 months. Another student used more hours to
complete the course (32.5 hours) but fitted those hours
into a period of 19 days. Of the students who have
completed the course, the maximum number of hours used is
55.3; this student worked for 10.5 months. One winter
student and two summer students had not yet completed the
elementary logic by January 1, 1975; as of that date, they
had spent 24.2, 25.3, and 48.5 hours on the system. The
average number of hours used by those who completed the
elementary logic course is 37.7.

Models of Individual Interest Trajectories

We studied in depth the interest level of individuals
over time by using some general axioms about interest
level from which can be derived a basic stochastic
differential equation that seems to be characteristic of
many different curricula. The equation is derived in
Suppes, Fletcher, and Zanotti (1973). The solution of the
stochastic differential equation may be written as

$$y(t) = bt^k + c ,$$

where y(t) is cumulative time on the system, t is a
function of the length of time the teletype has been in

the home, and parameters b, k, and c are estimated
separately for each student. In fact, we estimated b and
c 25 times for each student, once for each value of k from
.05 to 1.25 in steps of .05. '(That is, k = .05, .10, .15,
..., 1.25.) As we will show later, the value of k does
not significantly affect the fit of the theoretical curves
to the data.

In estimating individual parameters and fitting
individual curves to individual student data, we used the
mean standard error as our main measure to evaluate the
fit of the theory. To be explicit, let o_{ij} be observation
i for student j and t_{ij} be the corresponding theoretical
prediction. Then the standard error of n_j predictions for
student j is:

$$\text{standard error} = [1/n_j \sum_{i=1}^{n_j} (o_{ij} - t_{ij})^2]^{1/2}$$

and the mean standard error for the sample population of
students is just the mean of their standard errors. We
also used the mean absolute residual--that is, the mean
absolute difference in the predicted and observed values
for each student--and the mean of the maximum residuals
for each student as measures of fit.

We observed the cumulative time for each student on
the first and fifteenth of every month from October 1,
1973, through December 31, 1974, making an average of 10
points per student. The minimum number of points for any
student was 2 (this student was not included in the data
that test the theory), and the maximum was 22.

For the most part the theoretical curves were very
close to the observed data. Figures 5 and 6 are examples
of typical observed curves for students who had entered
the program by January of 1974, and Figures 7 and 8 are
examples of typical observed curves for students who
entered in June 1974.

The curves for the summer students differ from those
of the winter students as we would expect, because of the
greater amount of time available to them during school
vacation for working on the program. Plotted with each
curve are two theoretical curves, one using the k that
gave the best fit in terms of mean standard error and the
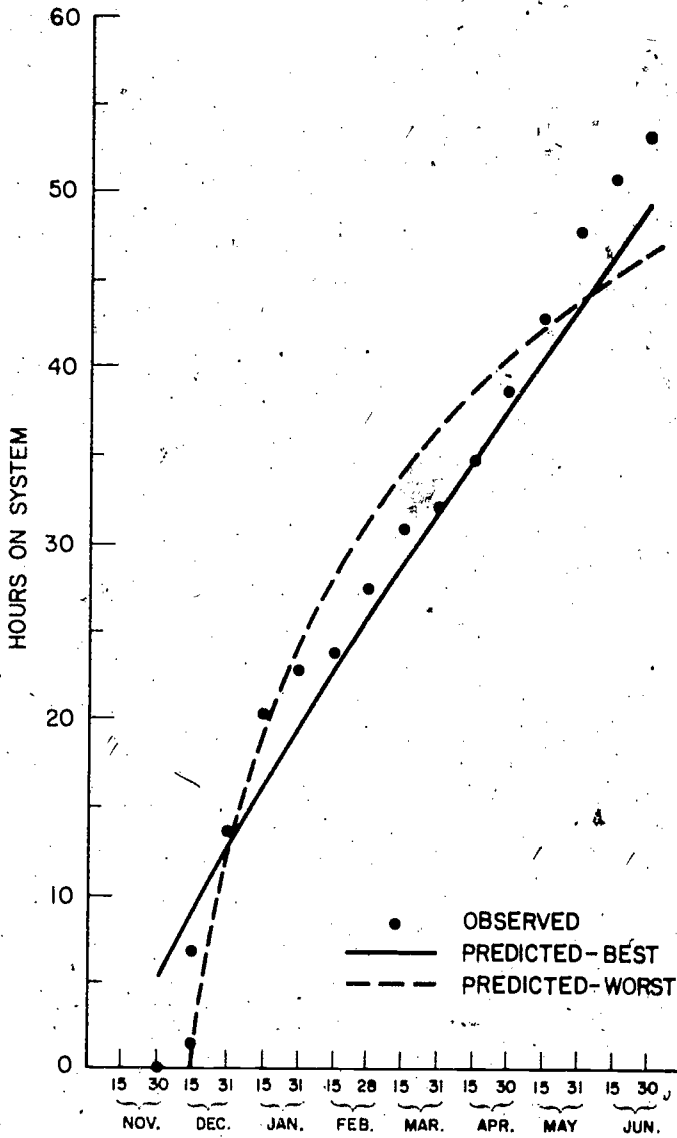
Figure 5. Typical student curves with best and worst
predicted curves (Student A).

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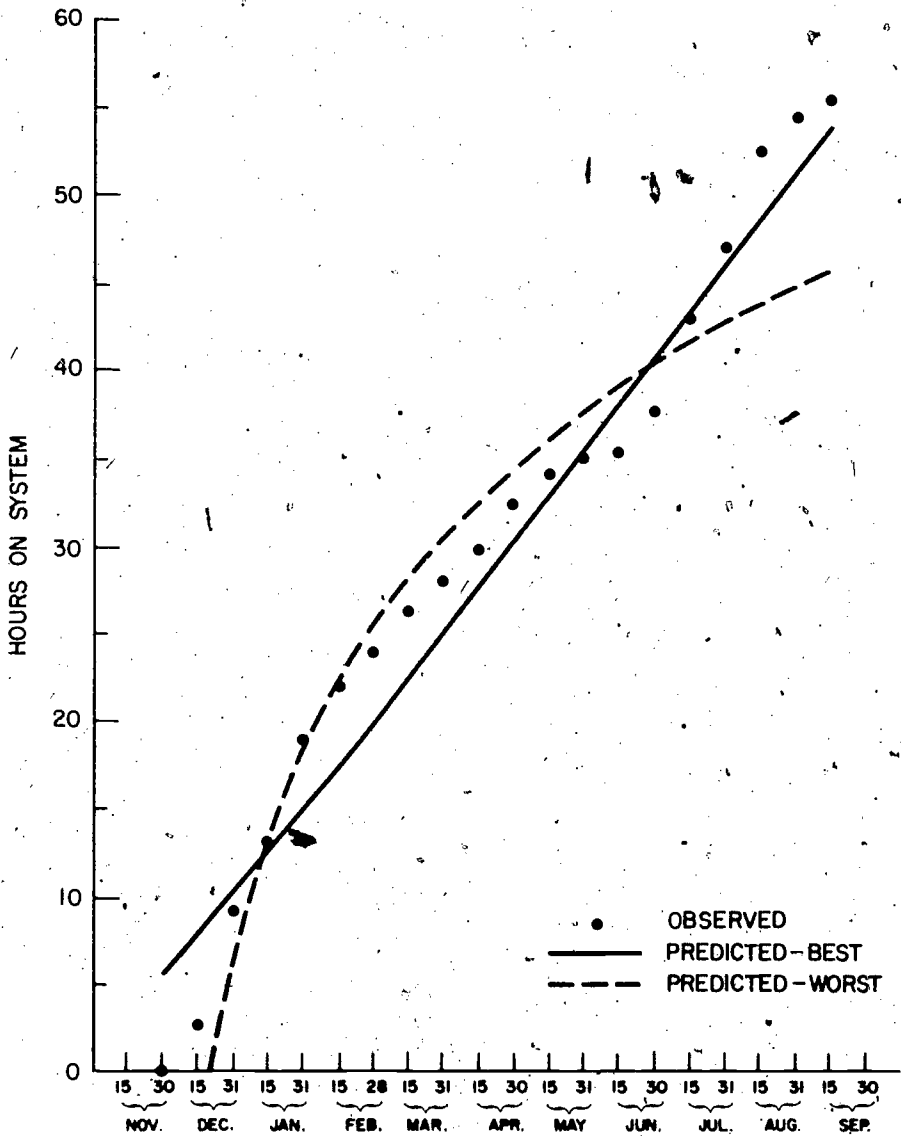
Figure 6. Typical student curves with best and worst predicted curves (Student B).
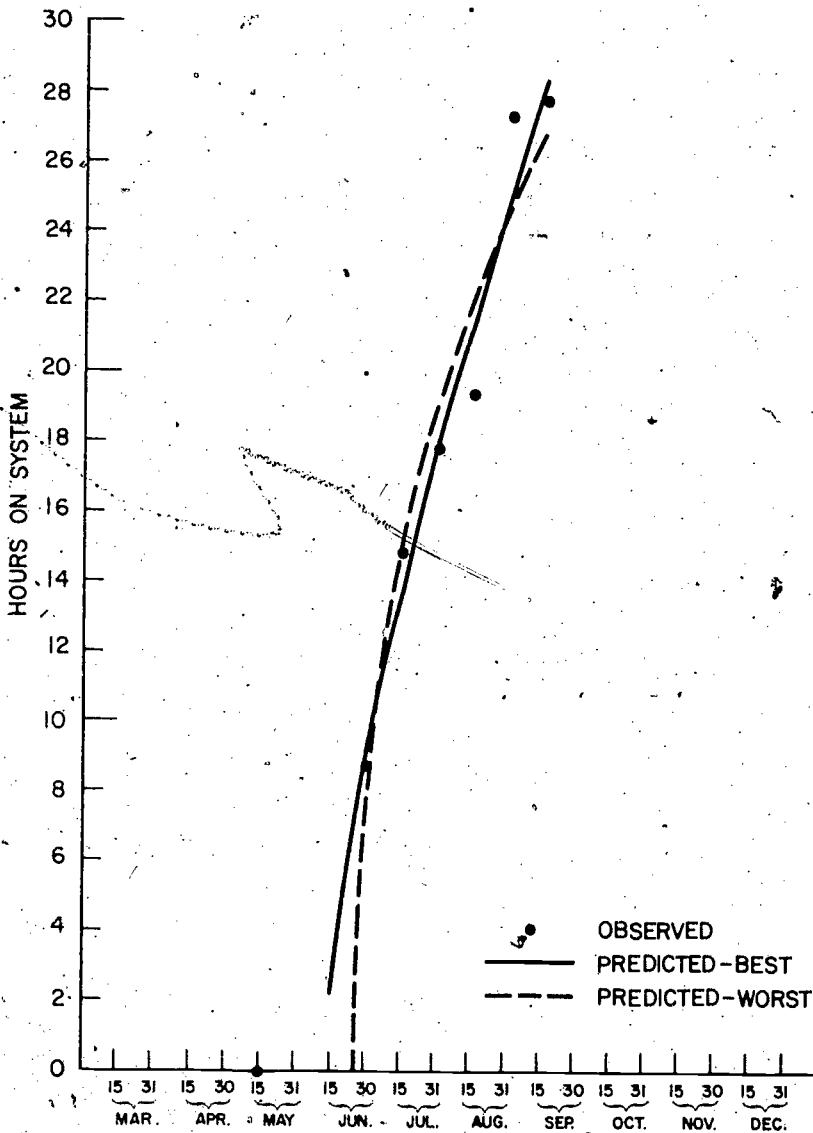
Figure 7. Typical student curves with best and worst
predicted curves (Student C).
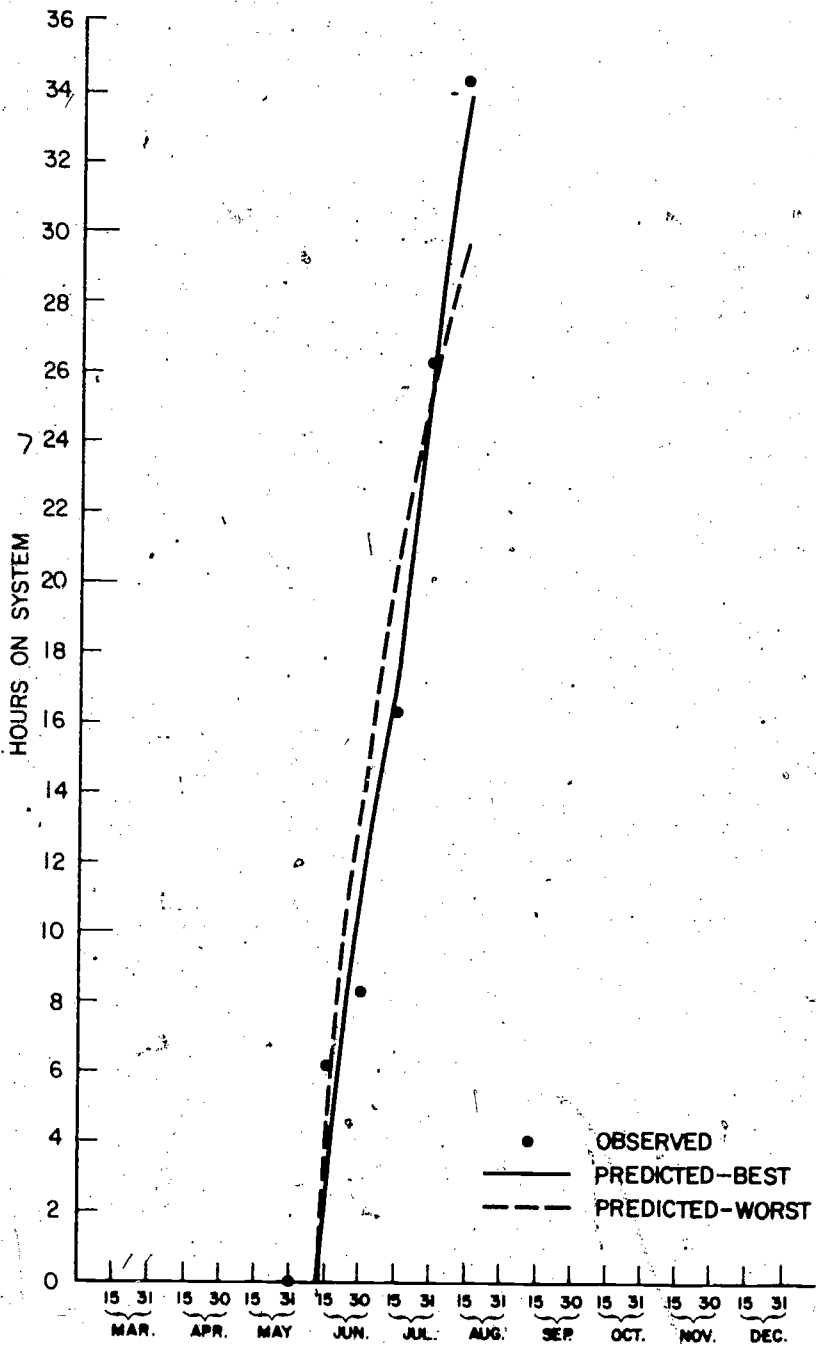
Figure 8.   Typical student curves with best and worst predicted curves (Student D).

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other using the k that gave the worst fit. It is clear
that the theoretical curves fit the data quite closely and
that there is not much difference between curves given by
the best and worst k.

Figure 9 shows an observed curve for which the theory
did not predict well; this student had a long period of
inactivity followed by a period of being very active. It
would be possible to derive an equation that would handle
cases such as this one in which there are long periods of
inactivity and then short bursts of activity, but only two
of our students followed this pattern and we decided not
to pursue the matter further.

To give a sense of the effect of using the same k for
all students and to see how the mean standard error varies
with the variation of k, we show in Table 14 the results
of letting k range from .05 to 1.25.

As can be seen from the table, the mean standard
error varies from a maximum of 2.3606 for k = .05 to a
minimum of 1.9391 for k = .70. The third column shows the
range across students of the standard error. In the worst
case, with k = .05, the top of the range is just slightly
under 7 hours. The mean absolute residuals are shown in
the fourth column; again the minimum, 1.6564, is for
k = .70 and the maximum, 2.0207, is for k = .05. The
sixth column shows the mean of the maximum absolute
residuals; here the values range from a minimum of 3.3661
for k = .55 to a maximum of 4.3897 for k = 1.25. The
range of the absolute residuals and the maximum absolute
residuals are shown in columns 5 and 7; they exhibit a
pattern similar to the ranges of standard error with the
largest values for the extreme values of k and the
smallest values for the middle values of k.

At the bottom of the table we have shown the fixed
value of k = .5620 that arises from taking the mean of the
best individual k's. This mean fixed k is close to the
minimum shown in the table in terms of each measure of
fit; this was true of the data in Suppes et al. (1973) as
well.

In Table 15 we compare the results for this
population mean of individually best k's with the mean
standard error for the individually best k's.

As in the Suppes et al. (1973) data, all measures
show improvement from going from an approximately best
k that is constant for all students to individually

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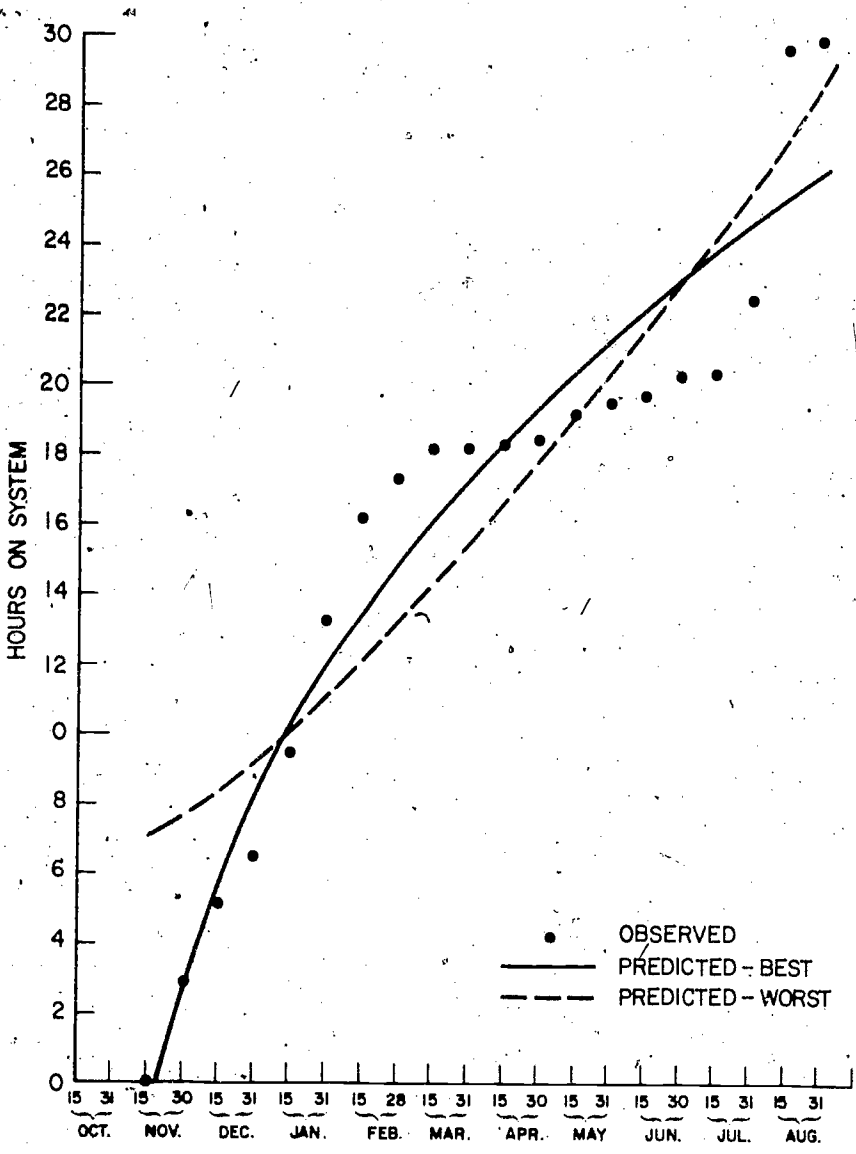
Figure 9. Curves for student for whom the model did not fit well.

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Table 14

Evaluation of Fit of Theory Using Same Exponent k for Each Student, but Individual Parameters b and c

k	Mean SE	Range of SE	Mean abs. residual	Range of abs. residual	Mean of max. abs. residual	Range of max. abs. residual
.05	2.3606	.2053-6.9852	2.0207	.1916-6.4676	4.1124	.2874-10.4569
.10	2.2999	.2291-6.7705	1.9643	.2139-6.2583	3.9860	.3210-10.1398
.15	2.2429	.2530-6.5572	1.9125	.2302-6.0457	3.8623	.3548-9.8041
.20	2.1898	.2770-6.3457	1.8635	.2478-5.8305	3.7460	.3888-9.4509
.25	2.1411	.3011-6.1368	1.8220	.2653-5.6135	3.6401	.4231-9.0823
.30	2.0972	.3253-5.9308	1.7886	.2826-5.3952	3.5464	.4575-8.7141
.35	2.0565	.3492-5.7282	1.7575	.2993-5.1763	3.4919	.4920-8.7196
.40	2.0252	.3579-5.5298	1.7329	.2890-4.9576	3.4448	.5267-8.7144
.45	1.9976	.3459-5.3358	1.7110	.2787-4.7394	3.4041	.5546-8.6987
.50	1.9754	.3342-5.1468	1.6917	.2683-4.5225	3.3814	.5377-8.6728
.55	1.9586	.3226-4.9634	1.6772	.2578-4.3074	3.3661	.5209-8.6368
.60	1.9471	.3112-4.8668	1.6675	.2494-4.2528	3.3815	.5044-8.5912
.65	1.9406	.3001-4.9359	1.6610	.2426-4.3080	3.4158	.4882-8.5363
.70	1.9391	.2829-5.0036	1.6564	.2358-4.3609	3.4620	.4722-8.4724
.75	1.9423	.2787-5.0698	1.6565	.2291-4.4116	3.5092	.4566-8.4000
.80	1.9500	.2684-5.1345	1.6615	.2224-4.4600	3.5596	.4414-8.3368
.85	1.9621	.2585-5.1977	1.6706	.2158-4.5061	3.6133	.4267-8.5248
.90	1.9782	.2490-5.2593	1.6821	.2092-4.5500	3.6701	.4120-8.7100
.95	1.9980	.2399-5.3194	1.6962	.2027-4.5916	3.7421	.3979-8.8922
1.00	2.0214	.2312-5.3779	1.7128	.1963-4.6310	3.8430	.3843-9.0714
1.05	2.0480	.2230-5.4349	1.7315	.1900-4.6683	3.9410	.3711-9.1048
1.10	2.0774	.2154-5.4904	1.7531	.1838-4.7034	4.0478	.3583-9.8368
1.15	2.1094	.2082-5.5443	1.7746	.1777-4.7365	4.1637	.3460-10.2527
1.20	2.1436	.2017-5.5967	1.7974	.1717-4.7675	4.2767	.3341-10.6527
1.25	2.1800	.1958-5.6477	1.8206	.1658-4.7965	4.3897	.3227-11.0373
.5620	1.9554	.3199-4.9202	1.6744	.2552-4.2561	3.3638	.5169-8.6257

Table 15

Comparison of Individually Best k's with Population Mean
of Individually Best k's

	Mean SE	Range of SE	Mean of mean abs. residuals	Mean of max. abs. residuals
Mean k = .5620	1.9554	.3199-4.9202	1.6744	3.3638
Individual k's	1.4745	.1916-4.0212	1.2932	2.7448

estimated k's. The standard error moves from 1.9554 with a constant k to 1.4745 with individual k's; the mean of the mean absolute residuals moves from 1.6744 to 1.2932; and the mean of the maximum absolute residuals moves from 3.3638 to 2.7448.

Figure 10 shows how relatively flat the curve of the mean standard error is when a fixed parameter k is used for the entire student population; the data are graphed from the second column of Table 14.

The flatness of Figure 10 indicates that if a fixed k is used for the entire population, there is no need to have an exact estimate of it; any value in the range from .45 to 1.00 will give about as good an estimate as any other. In Suppes et al. (1973), a similar curve was found with the best choices for k being between .3 and .6.

In Figure 11, we show the histogram for the distribution of the exponent k when estimated individually. The figure shows a wide range of best k values, and in this respect there is great student variability. On the other hand, Figure 10 and the Suppes et al. (1973) work have shown that considerable variation in the range of k will affect only slightly the fit of the predicted curve to the observed data, and so the variability is not as great as it appears.

Conclusions

Five rather different, but salient, conclusions seem to emerge from this study.

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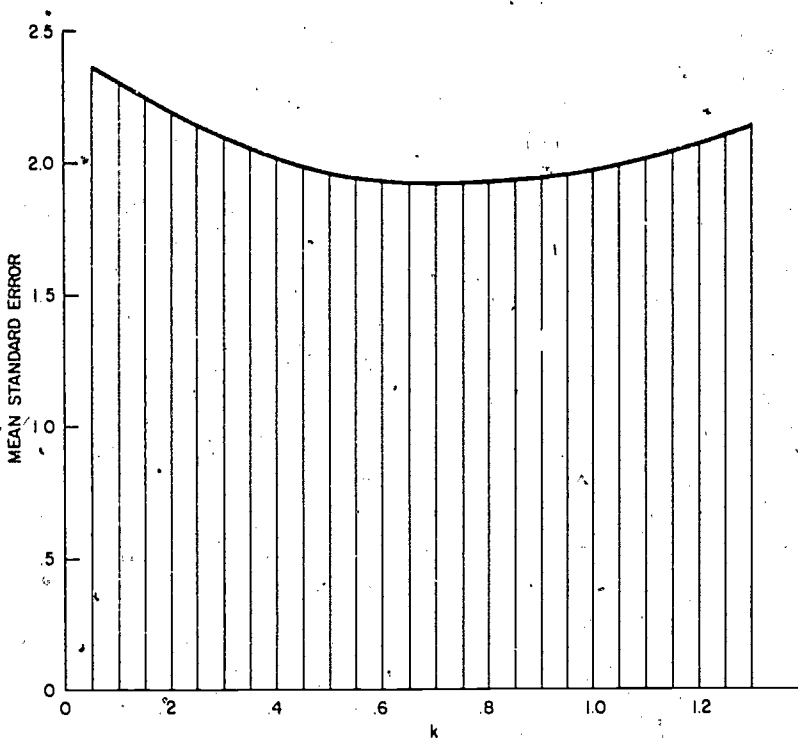
Figure 10. Graph of mean standard error as a function
            of the parameter k.
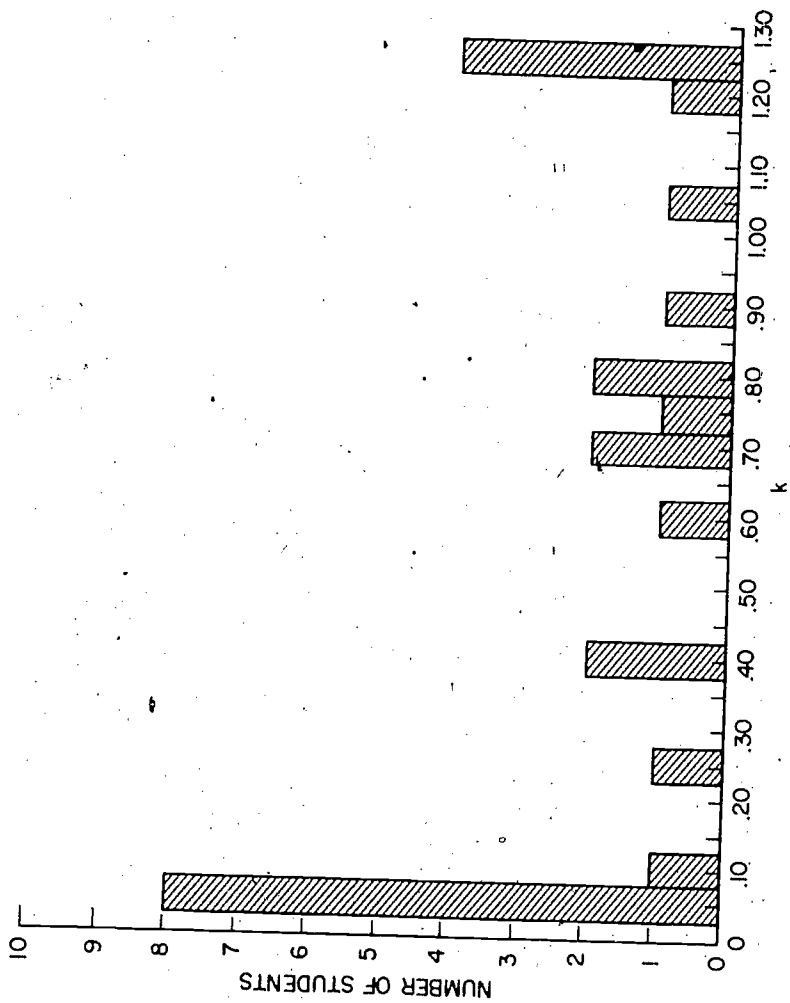
Figure 11. Histogram of the exponent k estimated individually for 25 students.

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First, the high dropout rate experienced with this very special and very bright population of students is characteristic of the high dropout rates observed in other home-study courses. We left the structure of the program very free in order to test whether very able students of the kind we were working with would be able to sustain an interest in relatively difficult material over a long period of time. It should also be remarked that all of these students had very busy programs both in and out of school. We were in fact surprised, after the program began, to find the amount of time some of them were devoting to it.

Second, on the basis of the high dropout rate experienced, we would conclude that a sustained program of home study for gifted students would require the introduction of considerable structure and also, probably, clear arrangements about academic credit for the course work done. Perhaps the best arrangement would be to be able to replace part of the routine school courses by the advanced courses available at computer terminals for home study, or at the very least to arrange for advanced credit for the courses competed.

From our extensive survey of the literature and from this intensive experiment, we believe that arrangements for introducing structure providing short-range goals for students, feedback on their progress, telephone conversations with proctors, and other forms of guidance and interaction need extensive experimentation in order to determine the optimal mix for home-study instruction. Our search of the literature indicates that there has as yet been very little serious experimentation on these matters. In view of the very large number of students engaged in home-study work in one form or another and given the technological possibilities for the future in terms of more intensive interactive courses available in the home, it seems most desirable that an extensive program of experimentation on the appropriate structures for such courses be undertaken.

Third, even though the students were in a very free environment of individualized study, the theoretical curves derived from the earlier work of Suppes et al. (1973) fit the student data surprisingly well. We believe that such theoretical curves can be introduced at a practical level to give students clear predictive

information on what they will accomplish in weeks ahead and to provide detailed guidance on their rate of progress. Such predictive student trajectories have, as far as we know, not previously been studied for home-based instruction. We believe that they offer an opportunity for a deeper understanding of learning rates in this environment and can be combined with advantage in the implementation of the kind of exprimental work described in the preceding paragraph.

Fourth, in ordinary studies of achievement of students in different technologies, for example, in the extensive survey of Jamison, Suppes, and Wells (1974), pretest and posttest achievement measures have been the primary instrument of assessment. The extensive data from correspondence courses and the restricted but detailed data from the group of very gifted students described in the present section indicate that, in the case of home-based instruction, the dropout rate is a more significant measure at the present time of assessment than actual achievement. This is meant in the sense that the primary problem of home-based instruction at the present time is, surely, to find ways to reduce the very large dropout rates encountered in almost all forms of home-based instruction. The variables that prove to have an effect on the dropout rate that were identified in Section I undoubtedly have substantial transfer effect to other technologies of instruction. We would recommend a very concentrated focus on dropout rate as an appropriate dependent variable for any experimental studies, and we would recommend that detailed quantitative and statistical models to predict the behavior of this variable be constructed. Although the literature surveyed in Section I is extensive, in one sense, with regard to analysis of the causes of dropout, it is on the other hand clear that detailed quantitative and statistical analysis using relatively sophisticated models has not as yet taken place and would almost certainly yield a better understanding of the phenomena than we now have.

Fifth, as we noted in the introducton to this report, we were disappointed at the lack of systematic studies of the costs of using various technologies for home-based instruction. We would strongly recommend that such studies be made, and we have some specific recommendations about such studies. It is evident that a number of

community colleges are now beginning to transfer a
significant number of courses to a home-based environment.
It would be particularly desirable to have data on the
costs of this alternative method of instruction and also
information as to whether the administrative decisions
that have led to the offering of such courses have partly
been due to economic pressures. We were not able to find
data on the point, but it is our conjecture that the
strong economic pressures on the system of higher
education in this country constitute the most important
single force for the continuing development of home-based
instruction. Within the confines and purposes of this
report, we were not able to undertake the analyses
required for a serious projection of some of these trends.
In fact, we believe that it is extremely difficult to
obtain the relevant data to make such projections. It is
for this reason that we would recommend that detailed
analyses of a few specific community colleges and
universities that are beginning to offer extensive home-
based instructional programs by television would be
desirable. It may be premature to undertake serious
economic analysis within the next year, but certainly
within the next three or four years such analysis should
be feasible on the basis of the experience that various
units of higher education will have accumulated by that
time.

It is important that the matter of economic analysis
be kept in perspective. It will for the indefinite
future, until the cost of paper is far beyond what it is
now, be cheapest to offer rather simple correspondence
courses from the standpoint of educational inputs, but as
our enormously complex system of higher education in this
country gives adequate evidence of, we are not satisfied
with minimizing educational costs even though the
necessity of operating with strict budgetary constraints
is now a problem faced by all levels of education. What
we would recommend is that a specific effort be conducted
over several years to develop and measure educational
production functions for home-based instruction and that
experimentation on various technologies for delivery of
instruction be examined, especially from the standpoint of
their production function characteristics.

Computer-assisted Instruction References

Jamison, D., Suppes, P., & Wells, S. The effectiveness of alternative instructional media: A survey. _Review of Educational Research_, 1974, _44_, 1-67.

Suppes, P. Computer-assisted instruction at Stanford. In _Man and computer_. (Proceedings of international conference, Bordeaux 1970.) Basel: Karger, 1972.

Suppes, P., Fletcher, J. D., & Zanotti, M. _Models of individual trajectories in computer-assisted instruction for deaf students_ (Tech. Rep. 214). Stanford, Calif.: Institute for Mathematical Studies in the Social Sciences, 1973.

Suppes, P., Goldberg, A., Kanz, G., Searle, B., & Stauffer, C. _Teacher's handbook for CAI courses_ (Tech. Rep. 178). Stanford, Calif.: Institute for Mathematical Studies in the Social Sciences, 1971.

Suppes, P., Jerman, M., & Brian, D. _Computer-assisted instruction: Stanford's 1965-66 arithmetic program_. New York: Academic Press, 1968.

III. CROSS-REFERENCED ANNOTATED BIBLIOGRAPHY

Description of Bibliography

The cross-referenced annotated bibliography is in
three subsections. The first subsection is the annotated
references, numbered and alphabetized in six groups with
the following group headings: dissemination; computers in
education; television and videotape; multimedia;
nontraditional study; and reference materials. To briefly
describe the contents of each reference we developed a
list of categories and subtopics; these descriptors
include information about the nature of the paper, the
type of program, and the particular subjects discussed in
the paper.

The second and third subgoups combine the descriptor
list with the reference list. The second subsection is a
list of all the references with each reference followed by
the numbers of the descriptors that fit best. The third
subsection is the mirror image of the second subsection;
it contains a list of all the descriptors with each
descriptor followed by the numbers of the appropriate
references. We have six groups of descriptors with the
following descriptor-group headings: effects on users,
media, program construction, programs, and programs
abroad. We did not include a special set of references to
television in the media descriptor-group because we have a
large group of major television references in the first
subsection and because more than three-fourths of the
other references we cite are concerned to some degree with
television; thus a special listing for television here
would not be useful in distinguishing references.. We did
not cross-reference any of the material in the reference
group (in the first subsection); the content is evident
from the title.

Most of the references we cite directly involve home
study; however, we have included some references that
discuss independent study programs that could be extended
to home study. Similarly, some references to experiments
in adult education and innovative educational technology
that could be applied to home study have been included.

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Our survey found very few references concerning the educational use of computers in homes. Britain's Open University uses some home-based computer terminals as a part of their program (see item [1.04] in the annotated references) as does the TICCIT (Time-shared Interactive, Computer-controlled, Information Television) project in the United States [1.03]. The Dial-A-Drill program in New York was a computer-controlled program in which students were called at home and given 5 minutes of practice in oral arithmetic problems; the oral exercises were generated from digitized word recordings stored on a computer disk, and the students responded by using a touch-tone dial [1.01]. The work of Stanford's Institute for Mathematical Studies in the Social Sciences concerning use by gifted students of home-based CAI--reported in the preceding section of this report--is one of the few examples of detailed research into the use of computers for home study.

The articles we found on the uses of television for instruction fall into four categories: position papers and conferences, descriptions of educational television projects for adults, descriptions of educational television projects for children, and the use of educational television in other countries. The articles on videotapes include position papers and descriptions of educational uses for adults; these are much fewer in number than those on television. An outspoken proponent of the use of television in all aspects of education is Gattegno [2.21]; his book suggests a basic set of elements necessary for the successful use of the medium and includes some new ideas for more effective methods of presentation. Behrman [2.03] takes the opposite position and claims that television with its one-way communication is not a viable procedure for teaching. Gross [2.25] conducted a large experiment comparing 8,000 students enrolled in two television courses with on-campus students in the same courses. Much work has been done concerning the Children's Television Workshop; some of it is descriptive and some experimental in nature ([2.02], [2.06], [2.11], [2.12], [2.13], [2.22], [2.36], [2.38], [2.39]). Another television project for children is one concerning environmental education that was tried in Maine [2.04]. Foreign countries that have experimented with

educational television are Australia, Israel, and New Zealand [2.29]; South Africa [2.30]; and Japan [2.01].

We have combined literature concerning educational uses of combinations of media or uses of media other than computers, television, and videotape in the multimedia group. Programs in this group that combine media are not as extensive in scope as those included in the nontraditional study group which follows and do not, by themselves, lead to an advanced degree. We cite work that provides a sample of programs in the United States and in foreign countries and have included position papers, conference reports, and research reviews. Because of the scarcity of data concerning the use of these media in homes, we have included some references to projects involving media in classrooms or learning centers that do not require human instructors and thus could be used in homes as well; this is particularly true of radio projects.

The group we have called nontraditional study includes degree-oriented programs that involve the use of a combination of media for out-of-class study. A leader among such programs is Britain's Open University. Articles that describe the total program at the Open University have been included here (e.g., [4.08], [4.32]); articles that are concerned with a particular type of medium as used in the program have been included in one of the earlier groups. Several projects in the United States have been patterned after the Open University; these include the large SUN (State University of Nebraska) project (e.g., [4.16], [4.25]), the University Without Walls project [4.27], the Open University of Houston [4.33], and external degree programs in New York [4.18] and Florida [4.10]. Some work is being done at Montclaire State College in New Jersey [4.21] toward finding ways to educate disadvantaged adults at home. Other literature mentioned in this group includes position papers, comparative overviews of several programs, and a few reports of similar work in other countries.

In the reference group we have included many bibliographies and educational indexes and directories to aid the reader interested in obtaining further information regarding a particular topic.

Annotated Bibliography

1. Computers in Education

1.01

TITLE: Final Report: An Evaluation of the Dial-A-Drill
               Program.

AUTHOR: Beech, R. P., McClelland, S. D., Horowitz, G. R., &
               Forlano, G.

INSTITUTION: State Education Department, New York, 1970.

Telephone: In this program students are called at home and given 5
             minutes' practice in oral arithmetic problems. The oral
Computer: exercises are generated from digitized word recordings
             stored on a computer disk, and the students respond by
             using a touch-tone dial. The report describes the pro-
             gram and data and provides some conclusions about the
Attitudes: results. A summary of the authors' extensive investi-
             gation of parent and student attitudes toward the pro-
             gram is included.

1.02

TITLE: Computer Assisted Lesson Service for Independent Study

AUTHOR: Brothers, W. L.

JOURNAL: Educational Technology, June 1972, Vol. 12, No. 6,
              p. 64.

Institution: This article describes the computer-assisted-instruction
             service of the United States Armed Forces Institute
             (USAFI). It includes major elements of the system
Statistics: history of the program and cites some of the limitations
             and statistics of the lesson volume.

1.03

TITLE: Team Production of Learner-Controlled Courseware:
              A Progress Report.

AUTHOR: Bunderson, C. V.

INSTITUTION: Institute for Computer Uses in Education, Division of
             Instructional Services, Brigham Young University, W164
             Stadium, Provo, Utah 84601. May 1, 1973.

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MITRE: In 1971, the National Science Foundation funded two or-
            ganizations, the MITRE Corporation in McLean, Virginia,
Texas: and the University of Texas CAI laboratory, with two
            separate but related contracts for investigations lead-
TICCIT: ing to the further development of MITRE's TICCIT (Time-
            shared Interactive, Computer-Controlled, Information
TV & CAI: Television) computer system concept. The concept of
            using minicomputers, television, and cable distribution
            to produce a low-cost CAI system had been developed
            extensively by MITRE on the strength of a substantial
            internal commitment prior to this time. MITRE was to
Hardware: develop hardware, and Texas was to develop courseware.
Courseware: Since substantial additional courseware was required, a
            third team was established at Brigham Young University.
Learner: This report gives an overview of the specific learner-
References: controlled courseware production. An extensive refer-
            ence list on the project is available.

1.04

TITLE: Communications Terminals Provide Lessons at Britain's
            Open University.

JOURNAL: Educational Technology, Oct. 1971, Vol. 11, No. 10,
            p. 16ff.

1.05

TITLE: Correspondence Study, Lost or Found.

AUTHOR: Holmberg, B.

JOURNAL: Convergence, 1972, Vol. 5, No. 2, pp. 7-14.

Correspon- The article describes correspondence study with emphasis
dence: on new educational methodology, course material, and
Relation-   media including CAI. Home study and student-teacher
ship: relationships are also discussed.

1.06

TITLE: Computer Assisted Instruction, Testing and Guidance.

AUTHOR: Holtzman, W. (Ed.)

PUBLISHED: New York: Harper & Row, 1970, 402 pages.

Implica-   The book deals with the application of computer tech-
tions: nology to education, and the psychological and socio-
            logical implications of computer teaching, testing, and
            counseling.

1.07

TITLE: An Overview of the TICCIT Program.

CORPORATION: The MITRE Corporation, Washington Operations, 1820
               Dolley Madison Boulevard, McLean, Va. 22101. Jan. 1974.

CAI: The MITRE Corporation attempts to accelerate the mass
                dissemination of an educationally sound form of CAI
                through a multiyear program of development, demonstra-
Goal: tion, and evaluation. The goal of this program is to
                demonstrate that CAI can provide better instruction at
                less cost than traditional instruction in community
References: colleges. An extensive list of other papers written
                about the project is available.

                2. Television and Videotape

2.01

TITLE: Educational Broadcasting in Japan.

AUTHOR: Anderson, R. S.

JOURNAL: Educational Perspectives, Oct. 1968, Vol. 7, No. 3,
                pp. 23-27, 31.

Television: The article discusses various aspects of educational
                broadcasting in Japan.

2.02

TITLE: The First Year of Sesame Street: An Evaluation.

AUTHORS: Ball, S., & Bogatz, C.

INSTITUTION: Educational Testing Service (ETS), Princeton, N.J.,
               1970.

3-5 year-   This report is an evaluation of the impact of educa-
olds: tional television on 3- to 5-year-old children. One of
                the research questions was: Do children learn more in
Character-   the home or in class? Characteristics of good learners
istic: are contrasted with those of poor learners. Two conclu-
Conclusions: sions were: (a) children who watched the most tended to
                have the best pre-post gain scores. and (b) children
                viewing in their homes were at no disadvantage in com-
Peers: parison with those viewing in a peer-group environment
                with teacher supervision.

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2:03

TITLE: TV, No Panacea for Education's Ills.

AUTHOR: Behrman, D.

PUBLISHED: UNESCO Features, 1971.

Criticism: This was an experiment to show faults of educational
            television. The thesis is that one-way communication
            is not a viable procedure for teaching.

2.04

TITLE: North of Hamaskeog: A Newer-active TV Project.

AUTHOR: Bogart, E. R. Van de

JOURNAL: Educational Broadcasting, Nov./Dec. 1972, Vol 5, No. 7.

Subject: A TV project in environmental education produced by the

Producer: Maine Public Broadcasting Network.

2.05

TITLE: Education and the Cable (A Personal View).

AUTHOR: Booth, E. G.

JOURNAL: Educational and Industrial Television, June 1973,
            Vol. 5, No. 6, pp. 11-13.

Advantage: The author suggests ways in which educators can take ad-
            vantage of the opportunity cable-television offers. She
            states that while the number of educational institutes
            or public-school systems with actual experience in
Educators: cable television is small, there are many indications
            that significant progress is being made in educating
            educators about cable.

2.06

TITLE: Three Models for Home-based Instructional Systems Using
            Television.

AUTHOR: Bretz, R.

PUBLISHED: Oct. 1972, 68 pages.

Home-based: A study was conducted concerning the use of television
            as a component of instructional programs designed for

Examples:	home-based students. Three programs were examined: Chicago's "TV College," Bavaria's "Telekolleg," and one of the Children's Television Workshop series, "Sesame Street." The paper discusses the planning and development stages of these three projects, pointing out the procedures, activities, and elements of each that appear to be particularly significant to its success.
Checklist:	A checklist of items necessary in the development of a new instructional program using television classifies the components neccessary for success, in four phases..
Model:	A general model is described that synthesizes the successful components in the preplanning, planning, promotion, production, operations, and evaluation stages, and gives a comparison of costs.

2.07

TITLE:	Team Production of Learner-controlled Courseware: A Progress Report.
AUTHOR:	Bunderson, C. V..
INSTITUTION:	Institute for Computer Uses in Education, Division of Instructional Services, Brigham Young University, W164 Stadium, Provo, Utah 84601. May 1973.
MITRE:	In 1971, the National Science Foundation funded two organizations, the MITRE Corporation in McLean, Virginia,
Texas:	and the University of Texas CAI laboratory, with two separate but related contracts for investigations leading to the further development of MITRE's TICCIT
TICCIT:	(Time-shared Interactive, Computer-Controlled, Information Television) computer system concept. The concept
TV & CAI:	of using minicomputers, television and cable distribution to produce a low-cost CAI system had been developed extensively by MITRE on the strength of a substantial internal commitment prior to this time. MITRE was to
hardware:	develop hardware, and Texas was to develop courseware.
Courseware:	Since substantial additional courseware was required, a third team was established at Brigham Young University. This report gives an overview of the specific learner-controlled courseware production. An extensive
References:	list of other papers written about the project is available.

2.08

TITLE:	1970 National Institute on Instructional Television and Adult Basic Education.
AUTHOR:	Buskey, J.

INSTITUTION: University of Maryland, Conferences and Institutes
             Division, University College; Division of Radio and
             Television, Department of Speech and Dramatics, College
             of Arts and Sciences. Summer 1970, 238 pages.

Training: A 3-week summer institute was established to train adult
             educators in the uses and techniques of instructional
             television and to acqaint television technicians with
             problems and goals of adult basic education. A central
Goal: goal was to give television more than its previously
             marginal role in Adult Basic Education (ABE) programs.

2.09

TITLE: A Concept for Continuing Education of Adults. Adult
             Learning Program Service Development of Phase III.

AUTHOR: Carlisle, R.

CORPORATION: Corporation for Public Broadcasting. May-Nov. 1972.
             60 pages.

Report: Details about the goals and content of the Adult Learn-
             ing Program Service Development "ALPS One" project, are
             included in this report by the Corporation for Public
             Broadcasting (CPB).

2.10

TITLE: Progress Testing . . . (With Sesame Street).

AUTHOR: Children's Television Workshop.

PUBLISHED: Jan. 27, 1970.

CTW: This report contains the following information about
             Children's Television Workshop (CTW) and Sesame Street:
Testing: methods and procedures, progress testing, and results of
Results: the Character Familiarity Test. It also gives results
             of the ETS-CTW Sesame Street Test Battery.

2.11

TITLE: Children's Television Workshop . . . A Proposal,
             1970/1971.

Proposal: This report contains the following information about
Problem: CTW: the present and the future, the problem of the
             preschool-educational wasteland. utilization by target
Reading: audiences, and exploration of a new series on an ap-
             proach to reading. Also in the appendix is a report on
Appendix: the following: instructional goals of Sesame Street,

1969-70, a proposal for Summative Evaluation of Sesame
Street, 1969-70, and a Children's Television Workshop
Utilization.

2.12

TITLE: Who Watched 'The Electric Company'. (The Electric
                Company In-school Utilization Study 1971-1972)

AUTHOR: Children's Television Workshop.

School   The report discusses the success of The Electric Company
survey: as shown by a school survey. The survey included
Target   questions about school adoption levels, slow readers
pupils: (target pupils), and viewing by pupils. There is also a
Manual: teacher survey and a description of a manual, "Teachers
                Guide to the Electric Company." A discussion of techni-
                cal deficiencies, activities to aid viewing, and future
                research is included in the report.

2.13

TITLE: Simulated Interpersonal Process Recall Through CCTV.

AUTHORS: Davis, W. C., & Whitehead, T. G. J.

JOURNAL: Educational Broadcasting, Jan./Feb. 1973, Vol. 6, No. 1.

Experiment: The article describes an experimental process which
                utilizes Closed Circuit Television (CCTV) to improve
Interviewer: interviewer skills and to acquaint individuals with
Training: their own impact on others. The goal is to train people
                in a basic technique for self-analysis and review in an
                interviewer setting.

2.14

TITLE: An Interim Report on Britain's Open University.

AUTHOR: Dirr, P.

JOURNAL: Educational Television, Dec. 1971, Vol. 3, No. 12,
                pp. 17-18, 27.

2.15

TITLE: Improving College and University Training.

AUTHOR: Dwyer, F. M.

JOURNAL: Improvising Visuals for Televised Instruction, 1970,
                Vol. 18, No. 4.

Suggestions: The article contains recommendations and suggestions to improve the visuals for instruction on television.

2.16

TITLE: Educational Television, The Next Ten Years.

REPORT: Stanford University Institute for Communications Research, Stanford University, California.

SPONSOR: U.S. Office of Education, OE-34036, Washington, D. C. 1965.

Problems: Problems of finance, program quality, manpower training and design and equipment of schools are discussed.
History: Appendices include brief histories of both educational television and educational radio.

2.17

TITLE: EVR: Teacher in a Cartridge.

JOURNAL: Change, Jan./Feb. 1971, Vol. 3, No. 1, pp. 40-43.

New tool: The article discusses the electronic videocartridge as a potent new learning tool while emphasizing some of the new problems it creates.

2.18

TITLE: Cumbin: City University Mutual Benefit Instructional Network.

AUTHORS: Freund, S. A., & Marlmas, V. C.

JOURNAL: Educational Broadcasting, July/Aug. 1972.

CCTV: The development of a closed circuit television (CCTV) system has allowed the following 22 institutions to
Users: offer specialized courses on their campuses: 10 senior colleges, 8 community colleges, a graduate center, an affiliated graduate school, and 2 urban centers of CUNY.

2.19

TITLE: The Video Cassette as an Educational Reality.

AUTHOR: Gabor, S. C.

JOURNAL: Educational Technology, Apr. 1972, Vol. 12, No. 4, pp. 35-37.

2.20

TITLE: Towards a Visual Culture: Educating Through Television.

AUTHOR: Gattegno, C.

PUBLISHED: New York: Outerbridge & Dienstfrey.   1969, 117 pages.

               Dr. Caleb Gattegno, a professional mathematician and
               educator, has been working in various fields of instruc-
               tion for over thirty years; he is an outspoken proponent
               of the use of television in all aspects of education.
Elements: His book suggests a basic set of elements necessary for
               the successful use of the medium. He calls for a more
Visual use: visual use of the medium and claims that sound hampers
               the viewer's sight or vision as he watches television.
               Gattegno suggests that more experimentation must take
               place to produce a new technology that would produce
               effects on the screen and the space around it.   The
               author spends considerable time discussing not only
               television, but the viewer as well.   Gattegno suggests
               the use of "horizontal programming," by which he means
               the use of 5- or 10-minute segments every day to develop
               a course of study that may take years to complete.   One
               might call the segments single-concept presentations, or
Commercials: commercials.   Sample "lessons" utilizing the horizontal
               programming concept are included.

2.21

TITLE: Pre-reading on Sesame Street.

AUTHORS: Gibbon, S. Y., & Palmer, E. L.

PAPER: Children's Television Workshop, June 1, 1970, 78 pages.

Description: This paper presents a brief history of CTW--its opera-
               tional model and the workshop that carried out the ini-
               tial experiment.   It is concerned with the language and
Goals: prereading goals represented in the Sesame Street cur-
               riculum.   Descriptions of production techniques, teach-
Strategies: ing strategies, letter-learning goals, humor, and prob-
               lems of sequencing and scheduling are provided.   Some
Data: preliminary data indicate that success has been achieved
               in teaching letter identification.

2.22

TITLE: The Maze of People and Machines.

AUTHOR: Gibson, L. G.

84   87

JOURNAL: Educational Broadcasting, Sept./Oct. 1972, Vol. 5, No. 6.

Advantages: The article contrasts advantages and disadvantages of
             choosing television as a training/communications medium.

2.23

TITLE: Video-Cassettes, Formalists, and Informalists in
             Education.

AUTHORS: Gordon, G. N., & Falk, I. A.

JOURNAL: Educational Technology, Jan. 1972, Vol. 12, No. 1,
             pp. 61-65.

Questions: This article deals with questions such as: What is this
             technology? What are the educational antagonisms?

2.24

TITLE: The Southern California Consortium for Community College
             Television.

AUTHOR: Gross, L. S.

JOURNAL: Educational and Industrial Television, Jan. 1973,
             Vol. 5, pp. 16-17, 20.

Comparision: A consortium of 20 community colleges in Southern
             California enrolled 8,000 students for two televised
             college-credit courses and made comparisions between
             these students and on-campus students in the same
Informa on: courses. Information was gathered through question-
             naires, college records, or interviews about course
             effectiveness, audience composition, and publicity
Results: effectiveness. Results are discussed.

2.25

TITLE: Directed Private Study.

AUTHOR: Jones, L. H.

JOURNAL: Adult Education (London), March 1972, Vol. 44, No. 6,
             pp. 374-379.

Media: This article discusses directed private study, which
             offers flexibility, effectiveness, and economy when it
             uses television and other media in addition to the
             traditional classroom instruction.

2.26

TITLE: The Talk'n Tube MBA at the University of South Carolina.

AUTHOR: Knauss, Z.

JOURNAL: Educational Television, Dec. 1971, Vol. 3, No. 12,
                pp. 9-11.

2.27

TITLE: Course Production at the Open University I: Some Basic
                Problems.

AUTHOR: Lewis, B. N.

JOURNAL: British Journal of Educational Technology, Jan. 1971,
                Vol. 2, No. 1, pp. 4-13.

Team: The aim of this paper is to expose problems that arise
                when a collaborating team has to produce teaching mate-
                rials for television broadcast under high time pressure.

2.28

TITLE: ITV and Education of Children of Migrant Farm Workers,
                Indians, and Inner-city Poor: Cross-cultural Compari-
                sons of International Uses of Media. Vols. 1, 2.

AUTHORS: Mackin, E. (Vol. 1), Kimmel, P. (Vol. 2), and others.

PUBLISHED: Jan. 1971, Vol. 1, 195 pages, and Vol. 2, 192 pages.

ERIC: ERIC Document Reproduction Service Nos. ED 050 570
                and ED 050 571.

ITV: In order to appraise the usefulness of instructional
                television (ITV) as the core component in instructional
                systems designed to meet the special needs of the educa-
                tionally disadvantaged children of migrant farm workers,
                American Indians, and the innner-city poor, a study was
                made of the use of ITV programs to meet similar needs
4 programs: in other countries. The four in-depth case studies
                that are presented are: educational radio and tele-
                vision in Australia, ITV in Israel, the Nippon Hoso
                Kyokai (NHK) Gakuen (high school) program in Japan, and
                educational radio in New Zealand. The programs used in
                Australia, New Zealand, and Japan rely on correpondence
Supplement: courses to supplement the instruction provided on tele-
                vision, while the Israel ITV system is integrated into
                the school curriculum throughout the country.

86 .

2.29

TITLE: Management Training by Teletuition.

AUTHOR: Marais, G.

CONFERENCE: 3rd International Productivity Congress--Management in
                the Future, Vienna, Hofburg, Oct. 28-30, 1970.

INSTITUTION: University of South Africa, Pretoria, South Africa.

Programs: This is a detailed paper outlining management training
                by television in South Africa. It describes the School
                of Business Leadership, the Master in Business Leader-
                ship, the Advanced Executive Program, and the Doctoral
                Program of the University of South Africa.

2.30

TITLE: Effects of Educational Television on Higher Education
                in the State of Colorado.

AUTHORS: Maxwell, L. M., & Lord, W.

JOURNAL: IEEE Transactions on Education, Feb. 1971, Vol. E14,
                No. 1, pp. 1-6.

Success: The authors suggest that the use of videotape at
                Colorado State University aids in instruction, as it
                saves costs and reaches many students. They feel that
Projects: project SURGE, graduate-level courses leading to higher
                degrees in engineering, and CO-TIE, a project offering
                prerequisites for pre-engineering, are applicable as
                solutions facing educators.

2.31

TITLE: MIT Videotape Series Can Replace Textbooks.

INSTITUTION: Massachusetts Institute of Technology Center of Advanced
                Engineering Study.

JOURNAL: Chemical and Engineering News, Nov. 15, 1971.

Lectures: The article advocates videotaping lectures and
                describes a special videotaped lecture series of
                Dr. R. F. Baddour, a noted chemist. The authors go
                so far as to ask the question, "Why have resident
                professors?"

2.32

TITLE: A Perspective on Cable Television and the University.

87

AUTHOR: Morris, A. J.

JOURNAL: Eudicom, Fall 1974, p. 4.

University: This article about a conference, held in 1974 and called
               "Cable Television and the University," covers a wide
               range of the topics and issues dealt with at the confer-
               ence, and supplements and clarifies some key points re-
               lating to the conference.

2.33

TITLE: Television Technology and the Culture of Childhood.

AUTHOR: Morrisett, L. N.

JOURNAL: Educational Researcher, Dec. 1973, Vol. 2. No. 12,
               pp. 3-5.

Research: This is a discussion of the importance of television to
               children (the heaviest television viewers) and the dif-
               ficulty and lack of research evidence to analyze the
               effects of television. There is speculation on the role
Cable TV: of cable television and the educational use of interac-
               tive cable television, with emphasis on the need for
               good research on the relation of the technology and
               childhood culture. Also discussed are technological
Two-way   changes in the future, such as the educational applica-
service: tions of two-way service. Such service would allow a
               child sitting at home to have his personal instructor
               in a course or play with his own companion in a game by
Computer: hooking up his television set to a central computer.
               The possibilities for new children's programs are almost
               endless; Sesame Street and the Electric Company are only
               the beginnings of what might be accomplished.

2.34

TITLE: An Overview of the TICCIT Program.

CORPORATION: The MITRE Corporation, Washington Operations, 1820
               Dolley Madison Boulevard, McLean, Va. 22101. Jan. 1974.

CAI: The MITRE Corporation attempts to accelerate the mass
               dissemination of an educationally sound form of CAI
               through a multiyear program of development, demonstra-
Goal: tion, and evaluation. The goal of this program is to
               demonstrate that CAI can provide better instruction at
               less cost than traditional instruction in community
References: colleges. An extensive list of other papers written
               about the project is available.

2.35

TITLE: Formative Research in Educational Television Production.

AUTHOR: Palmer, E. L.

PUBLISHED: Children's Television Workshop, 1972.

Behavioral: This comprehensive paper delineates the CTW operational
model, curriculum planning, behavioral goals, experi-
mental production, appeal of existing materials, and
research on several other aspects of the CTW. It also
Inter-   addresses itself to internal compatibility; activity-
personal: eliciting, organizational and interpersonal factors;
and many other topics regarding CTW.

2.36

TITLE: Automated Apprenticeship Training (AAT). A Systematized
Audio-visual Approach to Self-paced Job Training.

AUTHORS: Pieper, W. J., et al.

PUBLISHED: April 1973, 241 pages.

Self-pacing: AAT is a systematized audiovisual approach to self-paced
job training employing an easily operated teaching
device. Two courses were developed for Air Force
Scores: security police. Results indicate superior scores for
the AAT graduates on a job-specific preformance test,
an apprentice knowledge test. and supervisor's ratings.
Trainee man-hour requirements were lowered 30% and
supervisory man-hours were lowered 70%.

2.37

TITLE: The Responses of Children in 6 Small Viewing Groups to
Sesame Street.

AUTHOR: Reeves, B. F.

PUBLISHED: Children's Television Workshop, July 20, 1971.

Comparison: This report compares whole programs according to the
Techniques: following: degree of variety; length of individual
program elements; program elements, including the teach-
ing of numbers, words, letters, concepts, and coopera-
tion; and program techniques including the use of guest
stars, songs, and films.

2.38

TITLE: The Sesame Mother Project, Final Report.

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INSTITUTION: Institute for Educational Development.

REPORT: ERIC Reports. Aug. 27, 1971.

Overview: This report is a project overview including a literature survey, goals, objectives, details of the procedures, profiles of Sesame mothers and children, and an evalua-
Profiles: tion of the pilot project. It is a thorough and compre-hensive report, complete with data evaluation and conc-lusions.

2.39

TITLE: CATV: Its Implication . . . 1971.

AUTHOR: Shabut, O. E.

LOCATION: Chicago City College.

CATV: This is a position paper on Community Antenna Television (CATV)--its educational promise and relevancy to the City College of Chicago.

2.40

TITLE: Televised College Courses in Maryland.

AUTHOR: Smith, W. S.

JOURNAL: Educational and Industrial Television, Oct. 1973, Vol. 5, No. 10, pp. 18, 57.

Credit: The article describes how college credit via television in the fourth year of operation has become a large-
Courses: scale statewide operation in Maryland. In the fall of 1973, the Maryland Center for Public Broadcasting

offered 8 different courses which provided credit
State: through 17 colleges in every section of the state.

2.41

TITLE: Pilot Pattern for Home Management Instruction in Area Vocational School Curricula Based on Problems of Young Homemakers Employed Full-time in Clerical and Sales Occupations. (Continuation of Nos. 28 and 51). Final Report.

AUTHORS: Thomas, V. F., & Newman, A.

PUBLISHED: June 1970, 25 pages.

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ERIC:	ERIC Document Reproduction Service No. ED 048 470.
9 Packets:	This report discusses the experience of 107 vocational students in a 6-week pilot project which tested curriculum materials and implemented an instructional method consisting of 9 audiovisual instructional packets sup-
Question-	plemented by correspondence with a master teacher. Data
naires:	were acquired through interviews with teachers and questionnaires administered to students. It was suggested
Materials:	that, in order to use the materials in other types of educational centers, continuous correspondence between master teacher and students be encouraged, and additional units incorporating on-the-job management tasks be created. Several project materials are appended.

2.42

TITLE:	Dr. Walter J. Fahey: Microcampus Originator.
JOURNAL:	Videoplayer, Feb. 1973, Vol. 20, pp. 20-25, 28.
Interview:	An interview with the originator of a new approach to off-campus education utilizing videoplayers.

2.43

TITLE:	Fifteen Years of Televising College Courses.
AUTHOR:	Zigerell, J. J.
JOURNAL:	Chronicle of Higher Education, Washington, D.C., Jan. 3, 1972, Vol. 6, No. 13, p. 8.
TV courses:	In a letter to the Chronicle, James Zigerell, Executive Dean of the Learning Resources Laboratory and Television College, City Colleges of Chicago, discusses the televised college courses offered by this educational insti-
Degree:	tution prior to the use of the term "external degree

3. Multimedia

3.01

TITLE:	Potential Market for Two-way Information Services to the Home, 1970-1990.
AUTHOR:	Baran, P.
INSTITUTION:	Institute for the Future. Riverview Center, Middletown, Conn. 06457. Dec. 1971, 131 pages.

Industry: Two-way information services to the home may become a
$20 billion per year industry by the end of the next
decade; this report presents some market forecasts
for 30 such home-information services. The 30 possible
home information services are grouped into 6 major
Categories: categories: education, business, general information
access, shopping facilities, entertainment, and person-
to-person communications. Services included in the
Education: education category are: computer-aided school instruc-
tion, computer tutor, correspondence school, and adult
evening courses on television. Based on a Delphic
Predictions: study, predictions are made on uses of the categories
of series. Appended computer printouts offer a com-
pressed view of the forecasts for the 30 proposed
systems.

3.02

TITLE: Open-minded Adult Education.

AUTHOR: Barnes, N.

JOURNAL: Adult Education (London), March 1971, Vol. 43, No. 6,
pp. 356-370.

The Open University may stimulate integrated multimedia
teaching in the field of adult education.

3.03

TITLE: An Experiment to Determine the Effectiveness of Using
Audio-tapes for Independent Activities in a First Grade.

AUTHOR: Button, M.

PUBLISHED: 1972, 40 pages.

ERIC: ERIC Document Reproduction Service No. ED 079 952.

Tape   The experiment investigates the effectiveness of taped
recorder: lessons accompanying worksheets for independent work
activities in the first grade. The activities relate
to reading and auditory perception. The audiotapes ap-
Listening: peared to improve students' listening skills, but there
were no other significant differences between experi-
Control   mental and control groups. It appeared that further
group: study should investigate the impact of the individual's
cultural background upon his ability to read.

3.04

TITLE: Broadcasting and Britain's Open University.

95

AUTHOR: Carroll, J.

JOURNAL: Educational and Industrial Television, Oct. 1973,
               Vol. 5, No. 10, pp. 21-22, 55.

Radio, TV: This article is a brief evaluation of the British Open
               University focusing on its use of radio and television.

3.05

TITLE: Central Arrangements for Promoting Educational Tech-
               nology in the United Kingdom.

INSTITUTION: Great Britain, Department of Education and Science,
               1972.

Overview: This a detailed report of the role of educational tech-
Finances: nology in Britain including descriptions and financing
               of old and new organizations. In addition, relations
               with the educational technology industry are discussed.
Foundation: Annexed to the report is a proposal for audiovisual
               aids in education and an educational foundation for
               visual aids.

3.06

TITLE: The Open University--Tomorrow's Higher Education.

AUTHOR: Derolf, J.

JOURNAL: Adult Leadership, March 1972, Vol. 20, No. 9,
               pp. 329-330, 343.

Inter-   The author describes Britain's Open University as a
discipline: flexible adult-education system which utilizes an
               interdisciplinary approach and covers a wide range of

               subjects. He believes that each course should consist
Packages: of correspondence packages, a series of television and
               radio programs, organized tutorials, and counseling
U.S.A.:   systems. He explores possibilities of the establish-
               ment of such universities in the U.S.A.

3.07

TITLE: Development of Multimedia, Self-instructional, Study
               Units. Fourth Annual Progress Report, April 1, 1972
               through December 8, 1972.

PUBLISHED: 1972, 92 pages.

Program: This is the fourth annual progress report of a multi-
            media, self-instructional, nursing education program.
            Accomplishments are outlined, and the current state of
Sections: the project is described. Also included are sections on
            the probability of attaining the objectives, the impact
            of the project, and other publications. Descriptions of
            the study units which have thus far been developed and
            various other supplementary materials are appended.

3.08   /

TITLE: Extension Applications of Educational Technology.

JOURNAL: Spectator, March 1972, pp. 19-25.

Teaching   The article includes descriptions of programs using
aids: audiocassette tapes, computers, electrowriters, learn-
            ing resource centers, audiotutorials, instructional
            television, radio, telelectures, telenetworks, closed-
            circuit television, videotapes, videocassettes, and
            instructional films.

3.09

TITLE: Multi Media Systems. International Compendium.
            Eleven Project Descriptions of Combined Teaching
            Systems in Eight Countries.

AUTHOR: Gaudray, F., Comp.

PUBLISHED: 1970, 245 pages.

ERIC: ERIC Document Reproduction Service No. ED 047 533

Society: The demands made by modern technological society on the
            traditional educational system are briefly discussed.
8 countries: The remainder of the compendium describes 11 projects
            that are using educational technology--principally tele-
            vised instruction--with success. These are projects
            from Brazil, Canada, West Germany, France, England,
Reports: Japan, Poland, and the United States. Each report in-
            cludes the aims of the project, a description of the
            programming, statistics about participation, and con-
            clusions relating to the success of the programs.

3.10

TITLE: Some Background Considerations to the Establishment of
            an External Studies Programme.

AUTHOR: Gordon, H. L. A.

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PUBLISHED: No date (after 1971), 35 pages.

ERIC: ERIC Document Reproduction Service No. ED 049 430.

Combination: This study investigates how conventional, face-to-face
                teaching methods might be used in conjunction with cor-
                respondence study (CS), programmed instruction (PI),
West Indies: educational television (ETV), and radio broadcasts, to
                make higher education more widely available throughout
                the region served by the University of the West Indies.
                These auxiliary methods generally showed advantages in
                reaching scattered populations, coping with shortages of
                trained and skilled teachers, and enabling adults to
                study at home. Used with ETV, CS appeared to lose much
Effective-   of its flexibility but to produce more effective learn-
ness: ing; it does enable students to proceed at their own
                pace. Some methods showed disadvantages in cost, feed-
Guidelines: back, and opportunity for practical work. Guidelines
                are offered for administering and planning effective
                multimedia CS. The current state of British CS and
Open   educational broadcasting is also examined, with par-
University: ticular attention given to the Open University. Ten
References: references are included.

3.11

TITLE: Applications of Educational Technology at the Open
                University.

AUTHOR: Hawkridge, D. G.

JOURNAL: AV Communication Review, Spring 1972.

Analysis: The author analyzes problems of subject-matter compe-
                tence, diagnosing student abilities, creating conditions
Measuring: for improving instruction, and measuring achievement
                within the Open University framework.

3.12

TITLE: Continuing Education by Tape Correspondence.

AUTHOR: Hurley, H. K.

JOURNAL: Australian Journal of Adult Education, Nov. 1972,
                Vol. 12, No. 3, pp. 91-100.

Radio: The article describes a program at the University of New
                South Wales, Australia, which utilizes radio lectures
                that are taped and sent to students.

95

3.13

TITLE: The Effectiveness of Alternative Instructional Media:
              A Survey.

AUTHORS: Jamison, D., Suppes, P., & Wells, S.

PUBLISHED: Institute for Mathematical Studies in the Social
              Sciences, Stanford University, Stanford, California,
              Technical Report No. 196, February 1973, 72 pages.

Effective-   This survey provides an overview of research on the
ness: effectiveness of alternative instructional media:
              classroom instruction (CI), instructional radio (IR),
              instructional television (ITV), programmed instruction
Overall   (PI), and computer-assisted instruction (CAI). The
result: objective is to bring together the overall results for
Reference: the principal media. An extensive bibliography is
              included.

3.14

TITLE: Recent Developments in Radio/Correspondence Education
              in Kenya.

AUTHOR: Kinyanjui, P. E.

JOURNAL: Convergence, 1972, Vol. 5, No. 2, pp. 51-59.

Radio: This article describes a radio program that has been
              particularly effective in upgrading teachers, who
              comprise 90% of the enrollees.

3.15

TITLE: England's Open University: Revolution at Milton Keynes.

AUTHOR: Maclure, S.

JOURNAL: Change, March/April 1971, Vol. 3, No. 2, pp. 62-68.

Radio, TV: This article on the Open University discusses televised
              instruction, educational radio, and educational tech-
              nology.

3.16

TITLE: Mass Media in Adult Education.

AUTHOR: UNESCO.

96

PUBLISHED: Prague, Czechoslovakia: Czechoslovakian UNESCO Commis-
sion, International Central Institute for Youth and
Educational Television. Aug. 2, 1967, 105 pages.

Seminar: Documents of the Prague Simmar, "The Contribution of
Research to the Use of Audio-Visual Mass Media in Adult
Education, Oct. 5-10, 1966." This international
seminar, organized by the Central Committee of the
Specialists: Czechoslovakia Trade Union of Educational and Cultural
Commission, brought together 118 specialists in mass
Aims: media from 14 countries. The aims of the seminar were
to accelerate research relating to the use of audio-
visual mass media in adult education, to initiate inter-
disciplinary exchange in such areas as techniques and
methodology, and to further the cooperation of organiza-
tions and the coordination of their efforts in the
Topics: field. Seminar reports, accompanied by commentary,
deal with primary research problems, the state of the
Media: art of mass-media adult education, evaluation criteria,
and aspects of viewer research. The work groups dis-
cussed radio, television, films, and possibilities for
Conclusions: further research. Conclusions and suggestions were
given concerning research and training needs, publica-
tions, information exchange, and cooperative program
planning through UNESCO. The Document is available in
English, French, Spanish, Russian, Czech, and German.

3.17

TITLE: Correspondence Study in Multimedia Learning Systems.

AUTHOR: Mathieson, D. E.

JOURNAL: Continuing Education for Adults, Nov. 1970, No. 154,
pp. 1-4.

ERIC: ERIC Clearing House, 1970, No. 14.

Correspon- Assets and potentials of correspondence study with
dence: multimedia. This is a description of the Open Univer-
Institution: sity including uses of radio and television, correspon-
face-to-face dence study, short-term residential courses, and face-
meetings: to-face meetings with other students and tutors. It
Examination: briefly examines College Proficiency Examinations.

3.18

TITLE: Mediated Instructional Materials, Final Report.

PUBLISHED: Sept. 28, 1970; 176 pages.

ERIC: ERIC Document Reproduction Service No. ED 079 958.

Materials: This final report reviews the Elementary and Secondary
                Education Act (ESEA) TITLE 3 project that Evanston
                Township High School used to prepare self-instructional
                materials on film, audiotape, and videotape for use by
                students during independent study time. It lists the
Objectives: following objectives: (a) to determine the effective-
                ness of materials when used by other schools, (b) to
                identify problems involved with the exchange of mate-
                rials between schools, (c) to identify students' and
                teachers' attitudes toward these materials, (d) to eval-
                uate the effectiveness of these materials, and (e) to
                locate problems associated with local production and
Expecta-   distribution of materials. A summary on expectations
tions: and the effect on cooperating agencies is given. The
                final section deals with continuing the project without
Importance: federal assistance and states that the greatest result-
                ing change was faculty recognition of the importance of
                mediated instructional materials.

3.19

INSTITUTION: National Association of Educational Broadcasters.

NEWSLETTER: Memo on Instruction, March 15, 1971.

ADDRESS: National Association of Educational Broadcasters,
             1346 Connecticut Ave., N.W., Washington, D.C. 20036.

Radio, TV: This newsletter, which is published at unspecified
             intervals, contains news about educational radio and
New   television. New public, private, and government
programs: programs are summarized.

3.20

TITLE: Radioprimaria: Pilot Project in Mexico Using One
             Teacher plus Radio to Teach Grades 4-6.

INSTITUTION: Information Center on Instructional Technology.

NEWSLETTER: Instructional Technology Report, July/Aug. 1974,
             pp. 2-3.

Mexico: The purpose of the Radioprimaria, a project of the
             Mexican Secretariat of Education begun in 1970, is to
             provide instruction in Grades 4, 5, and 6 to rural
             schools which have only the first three grades of
             primary school. The incomplete primary schools provide
             one teacher for Grades 4 through 6 who is assisted by
Radio: the radio programs. The programs are prepared regularly
             in Mexico City and then transported to a university-
             operated radio station in San Luis Potosi where they

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Evaluation: are broadcast for 90 minutes a day. A Stanford study of Radioprimaria utilized the following methods to evalu-ate the radio schools in rural areas: direct observation, achievement testing, analysis of cost, questionnaires, and interviews. Their findings are briefly discussed.

3.21

TITLE: R and D for Adult Learning.

AUTHOR: Rahmlow, H. F.

JOURNAL: Audiovisual Instruction, April 1971, Vol. 16, No. 4, pp. 55-56.

Laboratory: Harold Rahmlow, the Executive Director of the Zimmerman Adult Learning Laboratory at the American College of Life Underwriters in Bryn Mawr, Pennsylvania, describes the multimedia facility for adult-learning research and
Vocations: development. The laboratory is the first to provide an experimental facility of this type where adults in the professions and vocations will be provided with learning resources to be used in career study.

3.22

TITLE: Continuing Education in Kenya.

AUTHOR: Reed, J.

JOURNAL: Educational Broadcasting, Oct. 1971, Vol. 4, No. 9, pp. 34-35.

Radio: This article discusses educational radio, adult education, and correspondence study in Kenya. Program descriptions are included.

3.23

TITLE: Towards Mass Education.

AUTHORS: Remtulla, K., & Barrett, H.

CONFERENCE: Paper presented at Conference of the African Adult Education Association (3rd, University of Dar Es Salaam, Tanzania, April 19-24, 1971). 17 pages.

ERIC: ERIC Document Reproduction Service No. ED 050 321.

Tanzania: Discussed in this paper are instruments directed toward mass education in use or soon to be in use in Tanzania.

Radio: These include: radio, radio with the addition of writ-
              ten study aids, and a combination of these with cor-
              respondence instruction. Because the radio approach to
              adult education has been uncoordinated at the national
Coordi-   level, plans are in progress to show the need for this
tion: type of coordination. The Cooperative Education Centre
Future: in Moshi has developed different methods of organizing
              and teaching cooperative education. The plan to estab-
              lish a national correspondence institution includes
              provisions for radio programs, study groups, and short
Residential: residential courses.

3.24

TITLE: Report of the Conference on Newer Media in
              Correspondence S udy.

INSTITUTION: Division of Extension, University of Texas.
              U.S. Department of Health, Education, and Welfare.
              Austin, Texas. 1962, 91 pages.

Guide: This is a report of a conference held in Austin, Texas,
              to develop a guide for the use of available audiovisual.
              media in correspondence study, and to set guidelines
Research: and specific projects for future study and research
              relating to the use of the newer media in correspondence
              study.

3.25

TITLE: Science and Technology Courses at the Open University.

JOURNAL: Educational Broadcasting International, June 1971,
              Vol. 5, pp. 92-94.

Integration: The article reviews an Open University science course,
              which integrates concepts of the major sciences. The
Computer: course is a multimedia course evaluating assignments
Television: via computer and using instructional television.

3.26

TITLE: Application of Radio to Teaching Elementary Mathematics —
              in a Developing Country.

AUTHOR: Searle, B.

INSTITUTION: Institute for Mathematical Studies in the Social
              Sciences (IMSSS), Stanford University, Stanford,
              California. June 30, 1974, 96 pages.

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First grade: First-grade mathematics is being taught in Nicaragua

Radio:

Worksheets:

classrooms by radio using a format designed to elicit
active responses by children. Daily radio lessons use
oral and written responses to carry the burden of
instruction. Intensive analysis of student responses
is made possible by the collection of daily worksheets.

3.27

TITLE: Social Education and Its Administration in Japan.

PUBLISHED: 1972, 44 pages.

ERIC: ERIC Document Reproduction Service No. ED 069 956.

Japan:

Training:

Radio:

Japanese social education covers most aspects of life
including out-of-school education for children and life-
long education of parents in the home. Both governmen-
tal and nongovernmental agencies are concerned with the
programs. Training for the personnel of these agencies
is provided by the National Training Intitute of Social
Education, study tours abroad, and a training course on
audiovisual education. Facilities utilized in the pro-
gram such as radio and television companies are listed.
An appendix gives locations of youth centers, shows
trends in enrollment, and diagrams the school educa-
tional system.

3.28

TITLE: Training in Business, Industry and Government.

SERIES: The Educational Technology Reviews Series. No. 12.

AVAILABLE: Educational Technology Publications, Inc., 140 Sylvan
Ave., Englewood Cliffs, N.J. 07632. Jan. 1973,
135 pages.

Training:

Problems:

This volume of the Review Series deals with training in
business, industry, and government; it is compiled from
selected articles published in recent issues of Educa-
tional Technology magazine. Topics discussed are quali-
ty control, computer support, development of training
systems, attitude change in industrial education, moti-
vation, military training, specifying objectives, self-
shaping training systems, programmed instruction, multi-
media instruction, and computers.

3.29

TITLE: The Open University: Breakthrough for Britain?

AUTHOR: Walsh, J.

Topics: The following topics are discussed with respect to the
            Open University: educational television, educational
            radio, social influences, and correspondence study.

3.30

TITLE: Report of Assessment and Development--INCE's Department
            of Instruction.

AUTHOR: Wedemeyer, C. A.

PUBLISHED: Feb. 1973, 69 pages.

ERIC: ERIC Document Reproduction Service No. ED 078 299.

Venezuela: This is an evaluation of INCE's Department of Instruc-
            tion, Caracas, Venezuela, which suggests ways in which
            the present program can be expanded and advises the
            staff concerning the use of media and technology.

3.31

TITLE: Chicago City Colleges, University Without Walls and
            With No Illusions.

AUTHOR: Zigerell, J. J.

INSTITUTION: Chicago City Colleges.   Oct. 1971.

Interest: The author cites reasons for the new surge of interest
Creden-   in programs serving adults without higher education and
tials: emphasizes the importance of credentials.

                    4.   Nontraditional Study

4.01

TITLE: Adult Education in Sweden.

PUBLISHED: 1970, 49 pages.

ERIC: ERIC Document Reproduction Service No. ED 055 263.

Forms: This review discusses the forms of adult education in
            Sweden; it includes the courses provided by the Labour
            Market Board, the folk high schools, the national and
            local educational schemes, the Commission for Television

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| Organi-
zations: | and Radio in Education (TRU), and the training courses
arranged by the employee organizations. Brief mention
is also made of other organizations, but the review is
not intended to be taken as a comprehensive report on
Swedish adult education. |

4.02

TITLE:	Open University/External Degree Program for Massachusetts.
AUTHOR:	Allen, J. E., Jr.
PUBLISHED:	Oct. 12, 1971, 28 pages.

Extension:	Recognition of the need for new approaches to the exten-
	sion and improvement of higher educational opportunity
Cost:	and for ways of reducing the cost of education to both
	students and taxpayers, has accelerated the interest in
	the establishment of external degree programs and pro-
Off-campus:	grams for off-campus higher education. In spring 1971,
	the chancellor of the Massachusetts board of higher edu-
	cation appointed two study teams to study the feasibili-
	ty of an external degree program as a means of providing
	an alternate form of higher education in Massachusetts,
Organi-	and to develop recommendations concerning a possible
zation:	administrative and organizational structure for the
	proposed external degree program. This document pre-
Conclusions:	sents the results of one of these studies. The conclu-
	sions and recommendations are based on information about
	the Massachusetts higher education system obtained from
Resources:	reports and memorandums, from analysis of legislation,
	from personal interviews with leaders of government and
	higher education, and from information about plans for
	the implementation of external degree programs elsewhere
	in the country.

4.03

TITLE:	Aspects of Adult Education in North America and Great Britain.
AUTHOR:	Bentley, C. F.
ERIC:	ERIC Document Reproduction Service No. ED 060 429.

4 countries:	The author presents the results of a tour made to obtain
	a broad picture of the state of development of adult
	education in cities of the United States, Canada, India,
Residential:	and the United Kingdom. Another objective of the tour
	was to examine the provisions made for residential adult

Topics: education overseas. Other topics discussed in the
                 report are the use of technical resources, the Open
                 University, cooperation between agencies, and workers'
                 education.

4.04

TITLE: Reaching Adults for Lifelong Learning.
                 Effective Communication Strategies for Recruitment
                 and Program Development in Adult Education.

AUTHORS: Butler-Paisley, M., Hall, D. C., Mick, C. K., &
                 Paisley, W. J.

INSTITUTION: Institute for Communications Research, Stanford
                 University. Aug. 1972 and Dec. 1973, 164 pages.

U.S.A.:   This report describes a study undertaken in 1971-1972
                 concerning the outreach (promotion for recruitment and
Conden-   programs development) of lifelong learning in the United
sation: States. This is a condensation of a previous report for
                 the United States Office of Education which occupied 3
                 volumes and 300 pages.

4.05

TITLE: The Open University--The Increasing Challenge to the
                 Regions.

AUTHOR: Cosford, R. H.

JOURNAL: Adult Education (London), Jan. 1973, Vol. 45, No. 5,
                 pp. 286-292.

Technology: This is an evaluation of the Open University in Great
                 Britain, which enrolls 40,000 students in correspondence
                 courses and uses technological media for education.

4.06

TITLE: The Open University.

AUTHOR: Collings, S. N.

JOURNAL: Mathematical Gazette, June 1971, Vol. 55, No. 393,
                 pp. 283-286.

Mathematics: This article describes the curriculum and methods of
                 instruction used for a foundation course in mathe-
                 matics at the Open University in Britain.

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4.07

TITLE: The Open University . . . Report on the Transplant.

AUTHORS: Drazek, S. J., & Walker, H. A.

JOURNAL: NUEA Spectator, June 1973, Vol. 37, No. 12, pp. 24-27.

Adults: The article describes the Open University of Britain
                including its establishment by Royal Charter to serve
                adult students, student characteristics, data tables,
                instructional materials, and program development.

4.08

TITLE: Goal Analysis of Post-secondary and Other Secondary
                Education.

INSTITUTION: Office of the Chancellor of the Swedish Universities,
                Department of Educational Research and Development.

CIRCULAR: Educational Development, Information on Research and
                Development in Post-secondary Education, 1974:2,
                6 pages.

Goal   This is a summary of a goal analysis project; the
analysis: purpose of the project is to reach a greater under-
                standing of the functions of education in a society
                with a greatly increasing interest in adult education.

4.09

TITLE: Innovative Higher Education for Adults. Redesigning the
                Halls of Ivy: Innovations in Higher Education.

AUTHOR: Kearney, K. E.

JOURNAL: Compact, Oct. 1971, Vol. 6, No. 5, pp. 31-33.

Florida: The article describes a unique external degree program
                at the University of South Florida which offers to
                adults a bachelor's degree based largely on independent
                study.

4.10

TITLE: The Experimental Study Group: A New Undergraduate
                Program.

AUTHOR: Levensky, M.

JOURNAL: Interchange, 1973, Vol. 4, No. 1, pp. 49-63.

Independent: This paper is an account of the first two years of the
             Experimental Study Group. Suggestions are made for a
             full-time program of supervised independent study and
             for planning similar programs in otherwise traditional
             schools.

4.11

TITLE: The Scene Today.

AUTHOR: Liechti, H. N.

JOURNAL: Educational Broadcasting, Nov./Dec. 1972, Vol. 5, No. 7.

Relations: The article outlines the evaluation, present role, and
             future plans of a program designed to improve student,
             college, and community relations.

4.12

TITLE: Revolution--Putting the Pieces Together.

AUTHOR: Lucas, V. B.

JOURNAL: Training in Business and Industry, Sept. 1971, Vol. 7,
             No. 9, pp. 29-33.

Building: A new education building at the American College of Life
             Underwriters in Bryn Mawr, Pennsylvania, will provide
             for experimentation and validation of innovative learn-
             ing experiences for adults.

4.13

TITLE: The Open University.

AUTHOR: Michael, R. E.

JOURNAL: New Campus, Spring 1971, Vol. 24, pp. 6-8.

Innovation: This article discusses various aspects of the Open Uni-
             versity, including instructional innovation, correspon-
             dence study, and educational development.

4.14

TITLE: Students Abroad Studying Their Own Thing.

AUTHOR: Michielli, J. A.

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JOURNAL: Improving College and University Teaching, 1972,
             Vol. 20, No. 3, pp. 160-161.

Abroad: Programs for independent study abroad promote true ap-
             preciation of foreign cultures.

4.15

TITLE: A Model, Regional Open Learning System.
             Proposal to the National Institute of Education.

INSTITUTION: University of Mid-America. Oct. 15, 1974, 234 pages:
             (With Appendix)

SUN: In 1974, SUN investigated formation of a regional con-
             sortium in order to broaden its economic base of opera-
             tions, increase its potential target audience, and as-
             sure that the open learning program reaches the widest
             possible learner market. The plan developed was found
UMA: to be both advantageous and feasible, and the Univer-
             sity of Mid-America (UMA) was incorporated on an non-
             profit basis. (See reference 4.25 of this bib-
             liography.)

4.16

TITLE: Another Approach to Higher Education. In Universal
             Higher Education: Costs and Benefits.

AUTHOR: Mood, A. M.

ANNUAL   1971 Annual Meeting, American Council on Education,
MEETING: Washington, D.C.

Restruc-   Radical restructuring of higher education centered
turing: around videocassettes and "some kind of institutional
             structure" called Video University is the proposal of
             the Director of the Public Policy Research Organization
             at the University of California at Irvine. The restruc-
             turing would involve students attending college full
             time for only one year, with additional higher educa-
Part time: tion as a part-time activity extending throughout their
             lives.

4.17

TITLE: Experience with Guided Self-study.

AUTHOR: Moo-Young, M.

JOURNAL: Journal of Engineering Education, Oct. 1972, Vol. 63,
             No. 1, pp. 27-29.

Self-paced: An innovative teaching method called "Proctorial, Auto-
             graded, Self-paced Study" was employed in an engineering
             college. The results are reported indicating that it
Lecture: has many advantages over the conventional lecture method
             of teaching.

4.18

TITLE: Regents External Degrees. Redesigning the Halls of Ivy:
             Innovations in Higher Education.

AUTHOR: Nolan, D. J.

JOURNAL: Compact, Oct. 1972, Vol. 6, No. 5, pp. 3-5.

Extension: A unique external degree program is offered by the re-
             gents of the New York State University to anyone who
             can pass appropriate proficiency examinations with or
             without attending college.

4.19

TITLE: Educational Technology and Non-traditional Study. 1972.

AUTHOR: Norwood, Frank W.

Critique: The author provides general comments and a critique of
             the resistance traditionally given to advances in educa-
Alterna-   tional technology, and suggests possible alternatives
tives: open to institutions and nontraditional educational
             programs.

4.20

TITLE: Chicago City Colleges, Opening the University to the
             Adult Citizen Who Can Study Only Off Campus.
             A Proposal . . . 1971.

INSTITUTION: Chicago City Colleges, 1971.

Proposal: A discussion is offered on the need for as well as the
             goals of off-campus programs. A description of course
Illinois: preparation and administration at the University of the
             State of Illinois is given as an example.

4.21

TITLE: Final Report. Demonstration and Evaluation of Program
             Learning in ABE Learning Centers.

AUTHOR: Ouderkirk, M., Comp.

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PROCEEDINGS: Strategy and Action; Curricular-Instructional Materials
and Related Media for the Disadvantaged Adult in the
1970's: Conference Proceedings, Cherry Hill. Feb. 4-6,
1970.

INSTITUTION: Adult and Continuing Education Center, Montclair State
College.

PUBLISHED: Upper Montclair, N.J. 1970, 172 pages.

Series: This unit is part of a series of five documents and two
cassette tapes that represent the procedure, findings,
and recommendations of the Demonstration Learning Center
project in Newark-Camden, New Jersey, July 1968 to
August, 1970, and the materials developed by project
participants. This document records the work and find-

Conference: ings of a conference of adult educators. researchers,
librarians, and representatives of the American Educa-
tional Publishers Institute, which met to identify the
instructional priorities of Adult Basic Education (ABE)
in this decade and to develop a strategy for the crea-
tion and testing of new instructional materials for the
diverse groups of undereducated adults. Included are:

Content: position papers, publisher presentations, conference
recommendations, and transcript of speeches. Emphasis

Emphasis: throughout is on reaching the adult realistically with-
in his own economic and cultural context.

4.22

TITLE: Report on Study Leave Tour. April-July 1972.
Ninth International Conference of International Council
on Correspondence Education and Visits to Various Coun-
tries.

AUTHOR: Pratt, H. C.

PUBLISHED: Royal Melbourne Institute of Technology, Jan. 1973,
96 pages.

Conference: This is a report by the Head of the Department of Ex-
ternal Studies of the Royal Melbourne Institute of Tech-

14 nology, after he attended the conference and selected
countries: institutions in 14 countries. The first part deals sep-
arately with each country, and the second part deals
with many aspects of external study on a very short

Topics: topic-by-topic basis. Topics include: radio and tele-
vision, study for credit, regional study centers, and
the future.

4.23

TITLE: Research into Higher Education, 1974:3.

INSTITUTION: Office of the Chancellor of the Swedish Universities,
                Department of Educational Research and Development.

CIRCULAR: Educational Development, Information on Research and
                Development in Post-secondary Education. 1974:3,
                11 pages:

Areas: The following are areas in which research projects are
                financed by the Office of the Chancellor of the Swedish
                Universities (UKA): (a) the structure of higher educa-
                tion and its relation to society.as a whole, (b) the
                organization and working patterns of teaching, and (c)
                evaluation--function and result control. This circular
                presents, in the form of summaries, the recently fi-
Projects: nanced projects in these areas in 1974-1975; a list of
                projects and names of scientific leaders and research
                institutions is included.

4.24

TITLE: External Studies in Australia.

AUTHOR:.   Smith, K.

JOURNAL: Home Study, June 1971, Vol. 2, No. 4, pp. 9-12.

History: The Assistant Director of External Studies at the Uni-
                versity of New England in Australia describes the
                growth of external courses in higher education.

4.25

PROJECT: S-U-N (State University of Nebraska).

INSTITUTION: University of Nebraska, P.O. Box 82446, Lincoln, Nebr.

Nebraska: SUN is a large project that started in 1971 at the Uni-
                versity of Nebraska, with 11 full-time staff members.
                Several large reports have been published on the proj-
                ect and may be obtained by writing to the address given
Objectives: above. Objectives of the project are to bring college-
                level courses to people wherever they may live or work.
                As SUN progresses it should cover 20 college-level
                courses, the equivalent of freshman and sophomore years.
Media: The media used are lesson modules utilizing newspapers,
                television, audio and TV cassettes, printed materials
                and study kits, tutoring assistance at resource centers

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Basic thrusts:	near home, and tutoring assistance by telephone. SUN hopes to develop (a) a new concept for the systemized design and validation of college-level courseware of superior quality, and (b) a new delivery system for American higher education that employs multiple instructional technologies in a modular manner to bring
Stages:	educational opportunity to all adults. Stages of the project have been: (a) October 1971 to February 1972--a Nebraska clientele study and a concern with questions related to awarding credit by "examination for experience," (b) February 1972 to June 1973--designing regional resource centers, and developing cooperative relationships with other institutions, and (c) June 1972 to May 1973--a literature survey, of related mate-
Statistics:	rial from 1969 to 1974. Statistics are presented concerning kinds of tests, clientele population in Nebraska, educational technology in external degree programs, and flexibility of curricular patterns. The reports
Appendices:	have appendices with information including similar experiments at other institutions, available resources, television in Nebraska, and technological media available through business and industrial organizations and educational publishers. (See reference 4.15 of this bibliography.)

4.26

TITLE:	College Degree for Adults. Redesigning the Halls of Ivy: Innovations in Higher Education.
AUTHOR:	Troutt, R.
JOURNAL:	Compact, Oct. 1972, Vol. 6, No. 5, pp. 27-30.
Oklahoma:	The article describes the unique Bachelor of Liberal Studies Program at the University of Oklahoma, which
Bacca-laureate:	serves as an adult-education equivalent to more traditional baccalaureate programs.

4.27

TITLE:	Universities Without Walls.
NEWSLETTER:	Ford Foundation Letter, Aug. 1, 1974, 1 page.
Experiment:	This is a brief description of the Universities-Without-Walls program administered by the Union for Experimenting Colleges and Universities, and set up with Ford Foundation and federal assistance. This experiment
Residency:	provides higher education without traditional residency, course, and timing requirements.

4.28

TITLE: Using Programmed Instruction.

SERIES: The Educational Technology Reviews Series. No. 10.

AVAILABLE: Educational Technology Publications, Inc., 140 Sylvan
                Avenue, Englewood Cliffs, N.J. 07632. Jan. 1973,
                136 pages.

                This is a volume of the Review Series centers on using
Articles: programmed instruction; it is composed of articles
                selected from recent issues of Educational Technology
Subjects: magazine. Subjects covered in the articles include per-
                formance in problem solving, the criterion problem, pro-
                grammed materials, contingency management, Soviet Union
                programs, reinforcement, specific subject-area pro-
                grams, materials for handicapped children, behavioral
                approaches, accountability, the history of programmed
                instruction, costs, self-instruction and growth, and
                humanizing education.

4.29

TITLE: Best Buy in Degrees.

AUTHOR: Verringer, F.

JOURNAL: Home Study, March 1971, Vol. 2, No. 3, pp. 10-12.

Costs: This article compares the costs and services of four
                British colleges offering external degree courses with
Content: those of the Open University. It consists of tabulated
                data on degrees offered, subjects, entrance require-
                ments, educational methods, program length, and costs.

4.30

TITLE: Who Are the Home Students?

AUTHOR: Verringer, F.

JOURNAL: Home Study, June 1973, Vol. 2, No. 4, pp. 6-8.

History: Some findings of the first major pieces of research
                into the vast world of home study in Great Britain are
                discussed.

4.31

TITLE: Taking Education to the People.

AUTHOR: Wall, M.

JOURNAL: Educational and Industrial Television, Oct. 1973,
            Vol. 5, No. 10, pp. 15-17.

SUN: This is a description of the research and development
            that went into the SUN project in Nebraska. It shows a
            study that demonstrates how to deliver higher education
            to the living room. A description of the project is
            given elsewhere in this bibliography (see refer nce
            4.25).

4.32

TITLE: Britain's Open University--A Model for Change.

AUTHOR: Wilson, T. C.

JOURNAL: Educational and Industrial Television, Oct. 1973,
            Vol. 5, No. 10.

Influence: The author describes ways in which the educational sys-
            tem of Britain's Open University may affect education
            in the United States.

4.33

TITLE: The Open University at Houston.

AUTHOR: Zwicky, L.

JOURNAL: Educational and Industrial Television, Oct. 1973,
            Vol. 5, No. 10, pp. 19, 53.

Use: The author discusses ways in which the University of
            Houston uses materials from Britain's Open University.

                    5.   Reference Materials

5.01

TITLE: Bibliography by American College of Life Underwriters.

5.02

TITLE: Bibliography by the College Entrance Examination Board.

5.03

TITLE: Bibliography by the Commission on Non-Traditional Study.

5.04

TITLE: Bibliography by the Educational Testing Service.

5.05

TITLE: British Broadcasting Corporation, BBC Handbook, London.

5.06

TITLE: Career Education: An ERIC Bibliography.

PUBLISHED: Macmillan Information, New York, N.Y. 1973, 360 pages.
Guide: This is a bibliographical guide to career education
          materials; it contains all the references on file at
Abstracts: ERIC on this subject. Included are abstracts of the
          documents and journal articles complete with title,
          authors' names, date of publication, and number of
Index: pages. To facilitate the information exchange, subject
          and author indexes are provided.

5.07

TITLE: Educational Broadcasting of NHK; Special issue of
          NHK Today and Tomorrow.

PUBLISHED: Oct. 1972, 42 pages, and Oct. 1971, 47 pages.

Japan: Nippon Hoso Kyokai (NHK), the Japan Broadcasting Cor-
          poration, is the only public service broadcasting or-
          ganization in Japan. This booklet lists the schedule
Schedule   of courses offered by NHK on Educational Television and
'72:   Radio for 1972. These courses, covering kindergarten
          to high school, include Japanese language, science,
          social studies, English, music, art, ethics, technical
Programs: questions, and home economics. Programs are also of-
          fered for correspondence education at senior-high-school
          and college levels. There are also special programs for
          physically or mentally handicapped children. The goals
          of NHK programming in each of these areas are discussed
          briefly.

5.08

TITLE: Education Index.

5.09

TITLE: Educational Technology: A Selected Bibliography.

AUTHORS: Dobson, C. R., & Leatherman, D. G.

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5.10

TITLE: The Open University, The External Degree and Non-Traditional Study.

AUTHOR: Fletcher, M.

PUBLISHED: 1972.

This bibliography was prepared by Marjorie Fletcher, the Research Librarian for the American College of Life Underwriters.

5.11

TITLE: Explorations in Non-Traditional Study.

AUTHORS: Gould, S. B., & Cross, P. (Eds.)

PUBLISHED: 1972.

5.12

TITLE: Index to Educational Audio Tapes.

DISTRIBUTOR: National Information Center for Educational Media (NICEM), University of Southern California, Los Angeles. 1971, 419 pages.

Objective: This index is intended to provide media staff, library personnel, and educators with a bibliographical guide to commercially prepared educational audiotapes. It

Titles: includes over 10,000 titles of tapes which may be used with students in Grades 1-12, college students, teacher trainees, or professionals. The division is as follows:

Division: (a) Subject Guide to Audio Tapes, including a Subject Heading Outline and an Index to Subject Headings; (b) Alphabetical Guide to Audio Tapes, incuding data such as age, level, length; and (c) Directory of Producers and Distributors.

5.13

TITLE: Index to Educational Videotapes

DISTRIBUTOR: National Information Center for Educational Media (NICEM), University of Southern California, Los Angeles. 1971, 245 pages.

Objective: This index is intended to provide media staff, library
               personnel, and educators with a bibliographical guide
               to commercially-prepared videotapes in Helical Scan and
               Standard Quadruplex configurations. It includes over
Content: 5,000 titles of videotapes, which may be used with
Users: students in Grades 1-12, college students, teacher
               trainees, or professionals. The division is as follows:
Division: (a) Subject Guide to Video Tapes including a Subject
               Heading Outline and an Index to Subject Headings; (b)
               Alphabetical Guide to Videotapes, including data such
               as age, level, and length; and (c) Directory of Pro-
               ducers and Distributors.

5.14

TITLE: NAEB Yearbook and Directory of Educational Broadcasting.
               Most recent year.

Listings: Listings of educational television and radio stations.

5.15

TITLE: Readers Guide to Periodical Literature.

5.16

TITLE: College Credit for Off-campus Study.

AUTHOR: Sharon, A. T.

PUBLISHED: March 1971, 18 pages.

ERIC: ERIC Document Reproduction Service No. ED 048 520.

Literature: This paper summarizes some of the recent literature on
               unconventional college-level education gained outside
               the classroom. The first section reviews the major
               types of off-campus learning for which college credit
               is received, including correspondence schools, educa-
               tional television, military service experiences, and
Examina-   independent study. The second section discusses
tions: methods by which formal recognition is provided for
               this form of education, such as the College-level
               Examination Program, the New York State College Profi-
               ciency Examination Program, and the General Education
               Development Testing Program. A list of references con-
               cludes the paper.

References with Descriptors

1. Computers in Education	Descriptors

1.01 Final Report: An Evaluation of the   B2 C1 D2
     Dial-A-Drill Program.
    Beech, R. P., McClelland, S. D.,
     Horowitz, G. R., & Forlano, G.

1.02 Computer Assisted Lesson Service for   D3 C1 E6
     Independent Study.
    Brothers, W. L.

1.03 Team Production of Learner-Controlled   B1 C1 D2
     Courseware: A Progress Report.
    Bunderson, C. V.

1.04 Communications Terminals Provide Lessons C1 F1
     at Britain's Open University.

1.05 Correspondence Study, Lost or Found.   A4 B2 C1
    Holmberg, B.   D4

1.06 Computer Assisted Instruction, Testing   B2 C1
     and Guidance.
    Holtzman, W. (Ed.)

1.07 An Overview of the TICCIT Program.   B1 C1 D2

2. Television and Videotape	

2.01 Educational Broadcasting in Japan.   F2
    Anderson, R. S.

2.02 The First Year of Sesame Street: An   B1 B2 E1
     Evaluation.
    Ball, S., & Bogatz, C.

2.14 An Interim Report on Britain's Open   F1
     University.
     'rr, P.

2.15 Improving College and University   D3   D5
     Training.
     Dwyer, F. M.

2.16 Educational Television, The Next Ten   C2   D2   D5
     Years.
     Stanford University Institute for
     Communications Research, Stanford
     University, California.

2.17 EVR: Teacher in a Cartridge.   B1   C3

2.18 Cumbin: City University Mutual Benefit   D1
     Instructional Network.
     Freund, S. A., & Marlmas, V. C.

2.19 The Video Cassette as an Educational   A4   C3
     Reality.
     Gabor, S. C.

2.20 Towards A Visual Culture: Educating   A4
     Through Television.
     Gattegno, C.

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2.22 The Maze of People and Machines.   A4
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2.23 Video-Cassettes, Formalists, and   A4   C3
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2.24 The Southern California Consortium for   B1   B2   D1
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     Gross, L. S.

2.25 Directed Private Study.   D2
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2.26 The Talk'n Tube MBA at the University of   E4
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     Knauss, Z.

2.27 Course Production at the Open   F1
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     Maxwell, L. M., & Lord, W.

2.31 MIT Videotape Series Can Replace   A4 C3
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2.33 Television Technology and the Culture   A4 B2 C1
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3.03 An Experiment to Determine the   B1   B2
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3.04 Broadcasting and Britain's Open   C2   F1
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4.02 Open University/External Degree Program   A4   D2   E2
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4.03 Aspects of Adult Education in North   D1   E5   F2
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4.25 S-U-N (State University of Nebraska).   D1   D6   E2
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     Wall, M.

4.32 Britain's Open University--A Model for   A4   E3   F1
     Change.
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4.33 The Open University at Houston.   E3   F1
     Zwicky, L.

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2. Literature reviews

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3. Newsletters and circulars

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4. Position papers

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2.11 2.12 2.13 2.17 2.21 2.24
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2. Psychological and social aspects

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2.24 2.33 2.35 2.38 3.03 3.09
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5. Overviews of several 2.28   3.09   3.22   4.01   4.03   4.22
   programs   4.23

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                          4.02   4.03   4.05   4.06   4.07   4.13
                          4.29   4.30   4.32   4.33   5.10

2. Others   2.01   2.28   2.29   3.09   3.10   3.12
                          3.14   3.20   3.22   3.23   3.26   3.27
                          3.30   4.01   4.03   4.08   4.14   4.22
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