

1-1-1988

# Effects of Instructional Television in Math, Science and Language Arts in Two Small Elementary Schools

Delbert Maroon

*Eastern Illinois University*

This research is a product of the graduate program in [Educational Administration](#) at Eastern Illinois University. [Find out more](#) about the program.

---

## Recommended Citation

Maroon, Delbert, "Effects of Instructional Television in Math, Science and Language Arts in Two Small Elementary Schools" (1988). *Masters Theses*. 2549.

<http://thekeep.eiu.edu/theses/2549>

This Thesis is brought to you for free and open access by the Student Theses & Publications at The Keep. It has been accepted for inclusion in Masters Theses by an authorized administrator of The Keep. For more information, please contact [tabruns@eiu.edu](mailto:tabruns@eiu.edu).

EFFECTS OF INSTRUCTIONAL TELEVISION IN MATH, SCIENCE

AND LANGUAGE ARTS IN TWO SMALL ELEMENTARY SCHOOLS

(TITLE)

BY

Delbert Maroon

Field Experience

~~THESIS~~

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Specialist in Education

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

1988

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

8-4-88

DATE

August 4, 1988

DATE

THESIS REPRODUCTION CERTIFICATE

TO: Graduate Degree Candidates who have written formal theses.

SUBJECT: Permission to reproduce theses.

The University Library is receiving a number of requests from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow theses to be copied.

Please sign one of the following statements:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

8-3-88

Date

I respectfully request Booth Library of Eastern Illinois University not allow my thesis be reproduced because \_\_\_\_\_

Date

Author

Effects of Instructional Television in Math,  
Science and Language Arts in Two Small  
Elementary Schools

Delbert Maroon

Eastern Illinois University

Running Head: INSTRUCTIONAL TELEVISION

## Abstract

This field experience investigated the effects of instructional television on academic achievement of fifth and sixth grade students in two small elementary schools in Bond County. A two tailed t-test for the difference of means at the .05 level of significance was used to analyze the data collected. A self assessment survey collected from nine teachers determined that no significant differences in opinion existed between members of the teaching staff regarding instructional television usage. An analysis of student grades determined that no significant increase in student grades was found in the comparisons made. Results of this study indicate that the implementation of instructional television has had little or no statistically significant effects on student achievement as determined by grade point average comparisons of students since entering school and the implementation of instructional television.

## Table of Contents

## Chapter I Overview of the Problem

Introduction . . . . .	4
Statement of the Problem . . . . .	8
Limitations of the Study . . . . .	9
Delimitation of the Study . . . . .	9
Definition of Terms . . . . .	10

## Chapter II Rationale and Review of Literature

Research Literature . . . . .	12
Review of Literature . . . . .	13
Principals Role . . . . .	15
Effects of Humor on Children Learning from I.T.V. . . . .	17
I.T.V. in Japan . . . . .	19
Satellite Technology . . . . .	20
Review of Research . . . . .	23

## Chapter III Research Design

Treatment . . . . .	30
Instrumentation . . . . .	31

## Chapter IV Results and Findings

Results . . . . .	33
Descriptive Statistics . . . . .	34
T-test Analysis . . . . .	38
Findings . . . . .	39

## Chapter V Summary, Recommendations and Conclusions

Summary . . . . .	44
Project Results . . . . .	46
Recommendations for Further Research . . . . .	47
Recommendations for Educational Practice . . . . .	47
Conclusions . . . . .	49

References . . . . .	51
----------------------	----

Appendix . . . . .	55
--------------------	----

## Chapter I

Overview of the ProblemIntroduction.

This study addresses the use of instructional television for developing and implementing curricula in an elementary school program. It is concerned with the impact of I.T.V. on school-age children ages (11-12).

Instructional Television has been a reality for more than a quarter century. From its inception, there has been an increase in the time spent viewing I.T.V. programs (Goldberg, 1983).

Educators are taking advantage of new opportunities to expand or improve education through cable television and advanced technology. Instructional television can extend the classroom and learning potential for hundreds of students. Instructional television has proved to be an effective and popular medium of instruction, more so than the I.T.V. programs first introduced in the 1950's (Bloom, 1984).

There are many critics who "believe that education is the only major American industry which does not yet make intensive use of modern technologies to reduce its cost and to increase the scope of its services" (Curtis and Bredenbach, 1979, p.3). Several interactive television

projects around the country have begun to utilize technology, in an innovative yet practical way, to increase the overall effectiveness and availability of educational opportunities in their communities.

Since the 1940's, some educators have looked to technology to revolutionize the education process. However, public elementary and secondary education has been slow to adopt technology. Therefore, technology has not brought about the sweeping changes once anticipated. Even though millions of dollars have been spent, the results have been disappointing (Prange, 1973).

Instructional television projects are an example of the successful use of technology for education. They are not, however, a panacea.

There are inherent problems which are possibly unsolvable, but which do not negate the positive effects. For example, not all students will find learning via television to be conducive to their learning style. Not all students feel comfortable learning from a "distant" teacher. In addition, the technology itself is not perfect. Any time technology is involved, the learning process can be interrupted. There will always be problems with atmospheric and external interference. Some cable systems can be rendered inoperative by snow, interference from C.B. radio or by cable or power outages. While a two minute breakdown



in audio contact may not sound like a serious technical problem, it certainly has proven to be for the teachers trying to encourage participation.

Bloom, Hastings and Madows (1971) provide an historical perspective to the state of I.T.V. evaluation over the preceding twenty years. Early I.T.V. research in the 1950's had a poor start with most studies comparing T.V. to traditional approaches and resulting typically in no significant difference in learning outcomes (Chu and Schraman, 1968; Briggs, 1977; Gordon, 1970). Few attempts were made to evaluate the unique qualities that I.T.V. holds for instruction.

Ackerman and Lipsitz (1979) report that "literally thousands of different I.T.V. research projects have been conducted" and cite the best known review of this research by Gordon (1970), Erickson and Curl (1972), Gough (1977), and Chu and Schramm (1968).

Although most educators cautiously agree that instructional television may contribute to learning as an enrichment device, some seem to have reservations about I.T.V. as an integral part of the learning experience.

Learning by television is not a new phenomenon. As an educational medium, it has gone through some severe growing pains. While advances have been made, including improvements in programming, faculties are still often

unprepared or unwilling to take advantage of this educational medium.

Stoloff (1980) points out that the setting may determine how effective I.T.V. is in communicating certain messages. His article deals with use of television as an instructional tool in a formal education setting. He suggests that use of E.T.V. for homework purposes and as a means for extending the hours of learning time to the home should not be overlooked.

The teaching - learning process is a process of communication between individuals - but only if people share some common meanings and experiences can true communication occur (Erickson, 1972). The channels of communication are varied and numerous, including music, dance, numerals and language. Input from television, radio, and contact with people stimulate and motivate a child to respond - to communicate. Indeed, a child learns language because of this need to communicate. Language is clearly a dominant factor in the human learning process.

The visual element is an important part of communication. With I.T.V., the presentation of language is in context, more authentic, and allows one to make the teaching more interesting and effective (McGovern, 1980). An instructional television series can contribute to language learning by providing common experiences and opportunities

for viewers to be active reviewers and producers of language.

Before one can explore desired learning outcomes, and how I.T.V. can facilitate such, it is important to examine the "conditions necessary for learning" (Briggs, 1980) since communication of language is such a dominant factor in the human learning process.

Gagne' (1980) summarizes how investigators, such as Estes in 1975 and 1978, have moved away from S-R association models of human learning to "models that include several stages of centrally located "information processing", such as sensory registration, short-term retention, long-term storage, retrieval and response organization".

In discussing different modes of learning with reference to the most advantageous media type, Gordon (1970) states that I.T.V. can be effective in precept learning (identifying with an example or model of a behavior or state of mind), modifying attitudes, and skill development (the skill is shown on T.V. in slow-motion or animation).

Regarding potential learning outcomes, Gordon (1970) feels that some I.T.V. courses can stimulate students' reflection and individual memories. Self-study can lead viewers to material not included in the presentation of the I.T.V. lesson itself.

Statement Of The Problem

The purpose of this study was to investigate the effects of instructional television on academic achievement of fifth and sixth graders in two small schools in Bond County.

Limitations of the Study

The geographical area and school setting for which the study was designed is predominantly rural and small with regard to student population. Instructional television was implemented in grade levels five and six.

Not under investigation are the possibilities of abuse of procedures by the educational staff.

Delimitations.

A factor related to this field experience that cannot be controlled is the limitation of knowledge of the building principals, and teachers - the information sources of the survey.

The study includes only 1987-1988 fifth and sixth graders in Bond County District #2 and charts the progress of these students from 1982 through 1988. Those elementary and Junior High schools elsewhere in the County who had instructional television prior to this year are not included in this study.

Definitions Of Terms

The following items are defined in order to understand the study and its objectives:

1. Instructional Television (I.T.V.) - Instructional television refers to television programs viewed by students in school which are produced for the specific purpose of achieving predetermined educational objectives.

2. Medium - That through which or by which anything is accomplished.

3. Supplementary Aid - An aid or resource used to enrich the regular school curriculum.

4. Television Literacy - Understanding the significance of I.T.V. and how it can be used to improve instruction.

5. Curriculum - Curriculum refers to the universe of planned activities in elementary and secondary schools for children aged five to eighteen, or those found in K-12 settings. All curricula, whether stated in specific behavioral terms or open-ended designs, provide an opportunity for learners to come in contact with a stimulus. The curricular strategies to utilize television proposed in this study were formulated to be adaptable with this definition in mind.

6. Children - Children, students and learners are synonymous for this study and are used interchangeably

throughout. This study was specifically concerned with curricula for elementary school children between the ages of five and fourteen or those who would be found in traditional K-8 organizational settings.

## Chapter II

## Rationale And Review Of Literature

Research Rationale

There are several concepts and theories of communication which have influenced the thought and logic for this study. Most teaching and learning are essentially information processing, which involves reception, interpretation, storage and retrieval through various systems.

Although public elementary and secondary education has almost always sought to develop and improve student academic achievement, the recent emphasis on school accountability, school report cards, and student achievement testing has increased efforts to improve academic achievement. It is the goal of this study to inform educational practice concerning instructional television as one possible route to improved academic achievement. Results are intended for teachers, teacher educators and administrators who develop, implement and maintain elementary programs. Hopefully, it will also be of interest to parents, school board members, and/or citizen groups who are concerned about or make decisions regarding the relationships between instructional television and the school curriculum.

Traditionally, the schools have been a place for verbal and written communication, but today our young people are

growing up with pictures and sounds as learning stimuli (Chodsi, 1982). Indeed, White's research (1981) has shown that the "effect of television on children has already turned them into electronic and visual learners" (McDaniel, 1982). As a result, "setting children up in schools to deal primarily with written and oral communication leaves them entirely unprepared for coping with the real communication demands of this society" (Allen, 1980).

The technological revolution of the past decades has had much of its greatest impact in the area of communication; television is commonly cited as a widespread example (Allen, 1980). Many educators and parents blame poor school performance on "too much T.V." and plainly do not like T.V. (McDaniel, 1982). However, it is evident that television has increasingly served as the major source of information (Stoloff, 1980) and that educators, far from ignoring the medium (Comstock, 1977) need to come to terms with it, and furthermore realize that "television can be - indeed must be - used effectively by teachers as part of the formal process of education" (McDaniel, 1982).

### Review Of Literature

#### Strategies.

Many strategies can be developed for I.T.V. utilization. Four of the most common include: (1) presenting information; (2) actively involving students



during programs; (3) motivating students to do something following programs; and (4) treatment of new curricular areas which are not a part of the school's traditional curriculum.

The most common strategy employed by teachers is the selection of an I.T.V. series to present information which introduces, supplements, complements and/or summarizes subject areas or issues which the teacher is required to cover as part of the school's curriculum. Teachers who can use I.T.V. and choose not to are ignoring a powerful teaching tool which brings special events and resources into the classroom that would otherwise not be available and which performs a variety of instructional functions. The focus of an I.T.V. series "should be only slightly ahead of its time - not too far ahead or educational leadership will not support it - not too far behind or the school may already have provided curricular materials and developed activities to address the need" (Rockman, 1978). Many of the instructional materials for I.T.V. series provide the teacher with lead-in, focus, and follow-up strategies.

The lead-in activity draws students' attention to the lesson by serving as a link between the previous classwork and the television lesson. It may be as simple as having individual reactions to a series of words, a drawing, a group picture, filling out a survey or any similar

transition activity.

Following the lead-in is the focus activity, which serves to direct the students' attention during the showing of the program. This activity serves to foster active viewing. For example, a student may focus on dates, names, details of an object being studied, looking for an actor who represents the way one feels, character's motivations, questions raised, specific facts, or new vocabulary words. When students know they are responsible to report their findings, attention is heightened and retention more comprehensive (Friedlander, 1976).

The follow-up activities may include a discussion of the focus activity, long-term projects, art experiences, debates, field trips, visits from experts, video productions or similar activities suited to the needs of the students and the objectives of the curriculum (Schramm, 1977).

With the rapid technological changes and the expanded possibilities which cable television promises and could deliver to the schools, it seems time for the 65 per cent of teachers who ignore instructional television to become versed in its use as a viable instructional tool.

#### Principal's Role.

In the schools of the future the principal will become a synthesizer who evaluates all of the human, technological, instructional, curricular, and student need components; and

a fine craftsperson who engineers the development of the final product. However, not only must principals show enthusiasm and support for new innovative approaches to learning, they must also nourish and stimulate interest and growth until the product has reached its fullest potential.

Technology in education will not evolve without administrative support at both the local building and central office level. The principal must be the main catalyst for technological change. Paramount is the principal's ability to understand the benefits for developing and implementing educational technology. And, having recognized the benefits of using technology, the principal's enthusiasm will more than likely be transmitted to others. Committees and groups of faculty, parents, students, and other interested citizens can then address the challenges that will bring about a stronger instructional program.

The bottom line for technology in tomorrow's school is two fold. First, technology is not a fad. Technological advances are happening throughout the world. We cannot ignore the educational implications. Second, those students who have been exposed to technology in the school will have a decided advantage when entering the workforce. Students, who are training on the use of computers, lasers, satellite technology and the like, will be prepared to move into the

workforce.

If we are truly educational leaders, we must seek out the best possible tools and allow for the best possible experiences for our teachers and students. Current technology can help principals assist teachers to reach their maximum effectiveness. But if we do not use the most current tools, ideas, and technology, our students will be deprived of the knowledge and understanding necessary to cope in today's changing world.

#### Effects Of Humor On Children's Learning From I.T.V.

Humor is abundantly present in children's educational television programs (Bryant, Hezel & Zillmann, 1979), and its presence seems well justified. The interspersion of humor in educational messages, first of all, aids greatly in attracting children to educational programs (Lesser, 1974; Wakshlag, Day & Zillmann, 1981). Perhaps more importantly, it is capable of facilitating the acquisition of educational information (e.g., Cantor & Reilly, 1979; Chapman & Crompton, 1978; Davies & Apter, 1980; Hauck & Thomas, 1972; Zillmann, Williams, Bryant, Boynton & Wolf, 1980), presumably by producing vigilance that revives fading attention (Zillmann, 1982; Zillmann & Bryant, 1983).

Not all uses of humor produce enhanced information acquisition, however. In the college classroom, for example, humor that is unrelated to a lecturer's topic tends

to abrogate whatever rapport the lecturer may have been able to establish with the students and, due in part to the deterioration of rapport, diminishes information acquisition (Zillmann & Bryant, 1983). Only humor that is well - integrated with educational materials is likely to enhance student-teacher rapport and does not produce a negative effect on learning. Students are apparently unwilling to accept arbitrary digressions on the part of their teachers, even when these digressions are humorous and potentially enjoyable. The students' response seems one of contempt, and this response apparently hampers attention to educational information.

This study has explored the relationship between the medium of television and the school. The review of the research on television and its impact on children identified major educational issues and movements and diverse utilization strategies.

However, the nature of research dictates that investigators confine themselves to very specific areas. Television, as a medium of communication and delivery system, cuts across the entire spectrum of organized knowledge and human experience. Hence, this study made a conscious effort to take a wholistic approach in defining instructional television and its relationship to the institution of schooling. Therefore, the study concentrated

on one small area of television utilization, instructional television in grades five and six of two rural elementary schools in Central Illinois. A synthesis of the evidence gathered from the literature and research lead the researcher to conclude that schools should provide opportunities for students to experience the media of I.T.V. ITV in Japan.

Nowhere in the world has the educational potential of television been more clearly recognized than in Japan's elementary schools. A television set has been provided for nearly every classroom, and eighty-seven percent of Japan's primary school teachers use school television (Akiyama, Imaizumi, and Inoue, 1981, pp. 22, 27, 29). By way of comparison, in the United States, only one elementary classroom in five contains a television set, and just fifty-six percent of the teachers in grades one through six report using television for teaching purposes (Riccobono, 1984, p. 5). Utilization rates for the three most popular Japanese elementary level programs are listed in Table I (Usami, 1981, p. 26). To gain some appreciation of the magnitude of these figures, the utilization rates of the most popular American school television program, "The Electric Company," peaked more than a decade ago at around twenty-five percent of the second and third grade urban school population (Palmer, 1978, p. 127).

Satellite Technology

Table 1:

Utilization Rates for the Three Most PopularJapanese Elementary SchoolTelevision Programs

Grade	Science		Moral Education		Social Studies	
	once	reg.	once	reg.	once	reg.
1	77.9%	47.7%	73.2%	51.9%	65.3%	40.2%
2	78.4%	44.2%	-	-	73.9%	44.6%
3	75.8%	38.3%	70.8%	45.7%	54.2%	23.8%
4	72.3%	33.9%	-	-	54.0%	24.5%
5	69.9%	32.5%	69.9%	41.8%	55.0%	27.8%
6	67.6%	31.3%	-	-	59.0%	32.2%

Satellite technology, with its ability to disperse information to many sites at one time, will have a far-reaching effect on school programs. Some of the basic applications of satellite-based instruction for future curriculum and administrative uses are that students will soon be able to hear, see, and speak to students in other countries. In the near future it will be commonplace for students in foreign language classes to more easily understand foreign cultures, and more easily gain speaking proficiency of languages by seeing/hearing first hand the idiosyncrasies of native speakers.

Educators are encouraged by numerous satellite networks to videotape broadcasts for future educational application. An especially wide range of program choices are available in the areas of Science, Mathematics, English, Vocational Education, Foreign Language and Fine Arts.

Another form of interactive video is currently being developed to interface videotape productions with computer software. The object is for students to view a videotape, and then periodically throughout the program interact with a computer to answer questions based on the videotape. The technique is now being used in special education programs, and the results have been impressive.

Why has school television been so successful in Japan? There are a number of good reasons. The Japanese Broadcasting Corporation, Nippon Hoso Kyokai (NHK), is one of the world's premier broadcasting units, and it has committed its vast resources to developing excellent school television programming. It has established a separate TV network, the NHK 2, devoted entirely to educational programming, which broadcasts eighteen hours a day. Fortunately, for NHK, a national curriculum has been established by Japan's Ministry of Education, and this course of study is largely adhered to throughout the country. Using this master curriculum plan, the NHK's school broadcasting division can design television



programming that coordinates fairly closely with what is being studied in elementary school classes from Hokkaido to Kyushu. The NHK has, furthermore, developed a close working relationship over the years with the Ministry of Education and the schools. Program advisory committees, composed of broadcasters, professors, administrators, and teachers, function effectively to plan worthwhile programming. The NHK's Radio and TV Culture Research Institute has provided research data on the educational use of school television programming, and this feedback has proven invaluable in designing effective programs (Tiene, 1983).

However, perhaps the NHK's most important move was to encourage the formation of an organization known as the ZEMPOREN. This acronym stands for the lengthy Japanese title, "Zenkoku Hoso Kyoiku Kenkyukai Renmei," which translates as the All Japan Teachers' Federation Studying the Use of Radio and Television in Education. The ZEMPOREN serves a number of critical functions that contribute significantly to the ongoing vitality of Japanese school television. It has no real counterpart in the United States, and, in its size and range of activities, it is perhaps unique throughout the world.

The ZEMPOREN promotes the effective classroom use of educational broadcasting in a variety of ways. It conducts meetings for teachers throughout the year at both local and

prefectural levels, a total of 527 meetings were held during 1981 in which 96,696 educators were in attendance (ZEMPOREN, 1981). At these meetings, teachers are encouraged to take advantage of available programming. Classroom techniques to enhance the instructional effectiveness of programs are suggested. Rewarding experiences and new ideas are solicited from members. Materials relevant to NHK school television series are distributed and examined. Especially fine shows are viewed for discussion purposes. New developments and upcoming events are announced. In short, these regularly scheduled meetings serve to both enlighten and encourage teachers in the more effective use of school television.

#### Review of Research

"The intersection of television and education has often been seen by researchers from three perspectives - instructional (I.T.V.), educational (E.T.V.), and commercial (C.T.V.) television"; these types of programs correspond respectively to three types of education - formal, non-formal, and informal as follows (Stoloff, 1980).

FIGURE I

A MODEL FOR THE TYPES OF TELEVISION  
AND OF EDUCATION

	TELEVISION		
	Instructional	Educational	Commerical
Setting	Classrooms, School Library	Out of School Clubs, Home	Home or Community Clubs
Institu- tions Purpose	Formal Academic Credit	Supplementary Education	Financial Interests
Viewers Purpose	Academic Enhancement	Specific Interests	Entertainment
	Formal	Non-Formal	Informal

This paper deals with use of television as an instructional tool in a formal education setting. Stoloff (1980) points out that the setting may determine how effective I.T.V. programming is in communicating certain messages.

Aversa and Morrison (1978) define design and evaluation variables that can be used to determine scope and desired results of I.T.V. programs as in the Figure below:

Figure II

<u>Design and Evaluation Variables</u>	<u>I.T.V.</u>
Instructional Interest	Well-defined objectives. Scope of program limited to objectives.
Intended Audience	Specific-very narrow.
Aesthetic Appeal	High for target, low for non-target.
Learning Outcomes	Viewer can be expected to show cognitive or psychomotor gains as experienced by objective.

The difference between I.T.V. and E.T.V. or C.T.V. is the degree that the "variables of learning are purposefully arranged to secure maximum learning outcomes" (Burns, 1977).

Instructional television forms the most obvious link between television and the school curriculum. Instructional television programs are designed to be viewed in school and

to achieve a wide range of predetermined educational objectives which more often than not coincide with traditional curricular offerings.

The research indicates that children can learn effectively from I.T.V. and that it can be used to teach any subject and encourage development of skills in all domains where one-way communication will contribute to learning. Despite the evidence and the increasing quality of I.T.V., the whole subject of classroom television remains a battleground for contending viewpoints (Curtis and Beidenbach, 1979).

Williams and Stanford (1977) provide an historical perspective to the state of I.T.V. evaluation over the past thirty years. Early I.T.V. research in the 1950's had a poor start with most studies comparing I.T.V. to traditional approaches and resulting typically in no significant differences in learning outcomes (Chu and Schramm, 1968; Briggs, 1977; Gordon, 1970). Few attempts were made to evaluate the unique qualities that T.V. holds for instruction.

Literally thousands of different I.T.V. research projects have been conducted and the best known reviews of this research are by Finn (1953), Kumath (1956), Barrow and Wesley (1958), Holmes (1959), Allen (1960), Reid and MacLennon (1967), and Chu and Schramm (1968).

Chu and Schramm (1968), in their extensive review of research on effects of televised learning involving hundreds of studies, reported no significant differences between learning from I.T.V. and conventional teaching. However, they also report that where there was significance, it was more likely to be in favor of I.T.V.

Chu and Schramm found that only a small portion of these comparisons of I.T.V. with conventional teaching had been done with "clean experimental design"; only ten out of 250 studies met rigid experimental design requirements. Wood and Wylie (1977) agree that the results can be traced to faulty research design, improper use of research tools or simply that the items being compared really were not comparing significantly different factors. However, Chu and Schramm recommend that these studies be used as research findings since, although they do not meet methodologically high standards, they still may provide some valuable information on an important research question (See Appendix A for a summary of the reviewed studies).

Gordon (1970), made these comments about the state of I.T.V. research:

1. There has been too much I.T.V. research and most of it has been lost in "sheer glut".

2. The level of I.T.V. research has been a "scandal"; most EdD. and PhD. studies have been trivial,

worthless.

3. New educational research, particularly I.T.V. research, follows in the tracks of old educational research.

4. Too much I.T.V. research has been incompetent and poorly designed.

Gordon (1970) also lists these standards for future I.T.V. research:

1. Worth
2. Functional generalization
- \*3. Theoretical relevance
- \*4. Analytic competence - be "mindful of pitfalls" in search for reliability and validity
- \*5. Replicability
- \*6. Research tradition - randomization, control factors, significance tests, sufficient sample
7. Integrity - dishonest research is caused by indolence and/or incompetence

Dwyer (1978) also cites the items marked with an asterisk (\*) above as criticism or weak areas in media-related research.

The school must provide the leadership in assisting children to learn from and about television. It seems ironic that the greatest communications system ever devised

"would fail to find a major role in an educational system whose essence is communication and which ostensibly demands the best communications media available (Friedlander, 1976). Edward R. Murrow, the news correspondent and television news pioneer, once remarked, "this instrument can teach, it can illuminate, it can even inspire, but it can only do so to the extent that humans are determined to use it to those ends. Otherwise, it is merely lights and wires in a box" (Lesser, 1974).



## Chapter III

## Research Design

For the purpose of this study, details of the research design are divided into the following categories:

population, treatment, and instrumentation.

Population

The population consisted of fifth grade students (n=57) and sixth grade students (n=52) from entire heterogeneously grouped classes attending two elementary schools in Bond County School District #2. The students ranged in age from 11.6 to 13.4 years.

Student backgrounds were similar in that all reside in a small Illinois community with a combined population of 5,000 persons where the major industry is farming.

Teachers involved with the study were all tenured and have been teaching within the district for a period of six to 21 years.

Treatment

The treatment utilized in the study consisted of implementation of instructional television (I.T.V.) programs from all subject areas supplied by the Southern Illinois Instructional Television Association (S.I.I.T.A.), which provides instructional television programs, tapes and services to cooperating schools in Southern Illinois. This program was implemented during the 1987-88 school year as a

medium to impact student achievement and attitudes.

I.T.V. was utilized for a period of approximately three to five hours per week by classroom teachers in the subject areas of language arts, math, and science.

### Instrumentation

Instrumentation for the study included the following: A student attitude survey; a Likert scale teacher self-assessment survey; and student academic achievement scores.

The student attitude survey was designed by Borders (1979) for her thesis, "An Investigation of the Impact of Television on Children in First Through Fifth Grades". The survey consists of four parts:

1. Part A of the student survey covers attitude toward instructional television (I.T.V.), with answer categories including usually/always and seldom/never.

2. Part B of the survey covers the student's preception of the effect I.T.V. has on their learning. The categories include: expanded knowledge, expanded vocabulary, more enthusiasm toward school, increased library use, calming/relaxing effect, and increased use of educational television at home.

3. Part C covers the subject area programs most enjoyed by the students. The categories include: art, English, health, language arts, reading, science, math,

music, physical education, and social studies.

4. Part D covers the students' overall attitude toward I.T.V. Answer categories include: favor the program and neutral to the program.

A teacher self-assessment survey developed from a "TV Viewing Survey" used by Moldeshauer and Miller (1980) was also utilized to determine attitude toward I.T.V. as an instructional medium (Appendix B). The Likert scale answer categories included: almost always, usually, sometimes, seldom, and almost never.

Finally, students yearly academic grade point average (GPA) scores in the subject areas of language arts, math, and science were utilized to compare gains prior to and after implementation of I.T.V. Student GPA scores from 1983 through 1987 were combined to determine one composite set of mean scores representing the before treatment control. Those mean scores were then compared to the 1987-1988 GPA scores to determine whether or not any significant gains resulted from the treatment.

Data analysis was completed utilizing the Statistical Package for the Social Sciences (SPSS). The following statistical programs were computed: descriptive statistics, frequency distributions, t-test analysis, and Pearson correlations. The analyses are delineated in the following chapter.

## Chapter IV

## Results and Findings

Results

Statistical analyses were conducted by the computing facilities at Eastern Illinois University and entailed the use of selected programs contained within the Statistical Package for the Social Sciences (SPSS). These included: descriptive statistics, frequency distributions and t-test analysis.

Descriptive statistics were computed on the student survey for both the fifth (n=57) and sixth (n=52) grade groups.

Part A of the student survey for fifth grade indicated positive results for educational value of programs, wider use of programs, and heightened interest in subjects. Table 2 describes the mean of the categories for each question.

Part B of the student survey for fifth grade indicates students' beliefs about the effect I.T.V. can have on their learning. Table 3 describes the mean results of the different responses. The total number of possible responses for each effect was 57.

In Part C of the student survey, the fifth graders indicated the subject most enjoyed when viewing I.T.V. Mean responses are reported in Table 4.

Table 2:

Descriptive Statistics for Student SurveyFifth Grade (n=57) Part A

Question*	Never	Seldom	Sometimes	Usually	Always
1.	01	04	16	19	17
2.	36	07	09	02	03
3.	06	07	19	06	19
4.	03	03	15	10	26

\*Questions include:

1. Do you feel that I.T.V. helps you learn?
2. Do you feel that student-teacher contact is impaired by I.T.V.?
3. Do you feel that a wider use of I.T.V. is needed?
4. Do you feel that the use of I.T.V. makes subjects more interesting?

Table 3:

Descriptive Statistics for Student SurveyFifth Grade (n=57) Part B

Effect	Mean Response*
Expanded knowledge	36
Expanded vocabulary	30
More enthusiasm	25
Increased library use	19
Calming effect	14
More educational TV at home	22

\*Possible total response of 57 for each effect

Table 4:

Descriptive Statistics for Student SurveyFifth Grade (n=57) Part C

Subject	Mean Response*
Art	20
English	02
Health	08
Language Arts	13
Reading	07
Science	48
Math	33
Music	04
Physical Education	16
Social Studies	19

\*Possible total response of 57 for each subject.

Part D of the student survey requested the fifth graders report their overall attitude toward I.T.V. as a learning medium. Table 5 delineates their responses.

Table 5:

Descriptive Statistics for Student SurveyFifth Grade (n=57) Part D

Overall Attitude	Mean Response
Favor	Against
29	02
Neutral	
26	

\*Possible total response of 57 for any one category.

Part A of the student survey for sixth grade (n=52) showed results similar to those of the fifth grade. Positive results were indicated for the educational value of I.T.V., a wider use of the medium, and heightened interest in school subjects. The results of Part A are delineated in Table 6.

Table 6:

Descriptive Statistics for Student SurveySixth Grade (n=52) Part A

Question*	Never	Seldom	Sometimes	Usually	Always
1.	03	07	14	16	12
2.	21	14	09	05	03
3.	08	10	15	10	09
4.	04	03	10	12	23

\*Questions include:

1. Do you feel that I.T.V. helps you learn?
2. Do you feel that student-teacher contact is impaired by I.T.V.?
3. Do you feel that a wider use of I.T.V. is needed?
4. Do you feel that the use of I.T.V. makes subjects more interesting?

Part B of the student survey for sixth grade indicates students' beliefs about the effect I.T.V. can have on their learning. Table 7 describes the mean results for the different responses. A total of 52 responses for any one effect was possible.

Table 7:

Descriptive Statistics for Student SurveySixth Grade (n=52) Part B

Effect	Mean Response*
Expanded knowledge	44
Expanded vocabulary	20
More enthusiasm	24
Increased library use	09
Calming effect	11
More educational TV at home	13

\*Possible total response of 52 for each effect

In Part C of the student survey, the sixth graders indicated the subject most enjoyed when viewing I.T.V. Mean responses are reported in Table 8.

Table 8:

Descriptive Statistics for Student Survey

Sixth Grade (n=52) Part C

Subject	Mean Response*
Art	10
English	03
Health	04
Language Arts	07
Reading	14
Science	39
Math	17
Music	06
Physical Education	11
Social Studies	12

\*Possible total response of 52 for each subject.

In Part D of the student survey requested that the sixth graders report their overall attitude toward I.T.V. as a learning medium. Table 9 delineates the response.

Table 9:

Descriptive Statistics for Student Survey

Sixth Grade (n=52) Part D

Overall Attitude	Mean Response
Favor	Against
30	02
Neutral	
20	

\*Possible total response of 52 for any one category.

Concerning student academic grade point in the areas of language arts, math and science, t-test analysis was employed to test the significance of difference in means



between the composite 1984-87 scores and the 1987-88 after treatment scores.

T-test results for the fifth grade group are delineated in Table 10. The mean scores for the areas of language arts, math and science are reported.

Table 10:

t-test Analysis

Composite and Final Academic Grade Point

Fifth Grade

Subject	Composite* Mean	Final** Mean	t	Significant at .05 level
Language Arts	2.6	2.9	.179	.097
Math	2.6	3.2	.459	.001
Science	2.6	3.0	.259	.022

\* The reported grade point average is a composite score from 1984 to 1987 for the subjects indicated.

\*\* The reported grade point average is a score from the 1987-88 school year for the subjects indicated.

T-test results for the sixth grade group are delineated in Table 11. Mean scores for composite and final academic grade point averages are reported for the subjects of language arts, math and science.

Table 11:

t-test Analysis

Composite and Final Academic Grade Point

Sixth Grade

Subject	Composite* Mean	Final** Mean	t	Significant at .05 level
Language Arts	2.8	2.7	.016	.871
Math	2.6	2.1	.314	.006
Science	2.8	2.5	.292	.010

\* The reported grade point average is a composite score from 1984 to 1987 for the subjects indicated.

\*\* The reported grade point average is a score from the 1987-88 school year for the subjects indicated.

Findings

The investigation sought an answer to the following research question, "Is there sufficient evidence to suggest that I.T.V. improved academic learning?"

The problem of evaluating the learning from televised instruction is not a simple one, especially if the evaluation is supposed to contribute something to understanding and controlling the learning process, as opposed to merely describing some of its more apparent characteristics. While television in education has brought into being several new professional roles, it is not at all clear that television has staked out for itself a new theory of instruction. Based on this researcher's attempt to determine any significant improvement after I.T.V. implementation, it can be summarized simply: No significant difference. Although isolated students showed increased

learning upon the introduction of the media, it was usually possible to explain the results in terms other than the effects of the medium. For example, the introduction of the instructional television was accompanied by a change in curriculum or teaching strategy. This may explain the positive results of many comparative studies in the past.

Although most educators cautiously agree that television may contribute to learning as a cultural enrichment device, they seem to have many reservations about televised instruction as an integral part of the learning experience. Many authors have made a strong case for the adoption of instructional television into our educational system, but advocacy and enthusiasm are not sufficient guarantees of success.

This field experience found that I.T.V. has not transformed education, nor has it significantly improved the learning of most students. Whether measured by the number of students affected, or by the quality of the product, or by the advancement of learning, televised teaching is still outside the process of educating. Accordingly, with minor exceptions, the total disappearance of I.T.V. would leave the educational system fundamentally unchanged.

The kind of research that characterizes most of the documents purporting to examine I.T.V. are very unclear. That is, they show no significant difference between courses

taught over television and equivalent courses given to live matched groups.

Without going into elaborate research designs, it is possible for teachers and producers of I.T.V. lessons to evaluate their work by rule of thumb, provided that they do not try to pass off such evaluation as scientific research conclusion based upon rigid criteria for investigation. Such inquiry is extremely useful in keeping an ongoing check of students' and teachers responses to I.T.V. lessons.

One good-and simple-way used to elicit such informal evaluations is to circulate a questionnaire (See Appendix B) to teachers using I.T.V. and ask them what they think of I.T.V. and what suggestions for improvements they feel should be made. In general, open-ended questions are more useful than check sheets or scale or rating devices. The latter are fine for quantifying formal research, but tend to be confusing (and are misinterpreted) when one is looking for simple, clear cut guidance from results of evaluation.

The information from the questionnaires for teachers and students (Appendix A), combined with grade averages of students in I.T.V. classes compared with grade averages of previous students not in I.T.V. classes, produced interesting and useful data without going through tedious processes of matching groups and controlling variables. This approach could be used since the results obtained

produced the rough evaluation necessary to determine that ITV in these classes in these schools did not result in significant improvement in academic achievement.

An I.T.V. attitude survey (Appendix B) was given to the faculty at both elementary schools. The author realizes that attitudes often mean little taken alone, particularly in education. The data on attitudes provided rough guides to sensitive areas in the progress of I.T.V. classroom programs. The best way, to date, of determining just what the attitudes of people are towards some subject is to ask them, as clearly and as simply possible.

Student attitudes towards the I.T.V. in the classroom were affirmative at first (Appendix A). They will most likely level off or turn negative until they are convinced that I.T.V. does not penalize their grade averages. The author believes that one can probably expect criticism to deepen as one ascends from elementary to higher education.

Teachers' dispositions seem to work in exactly the opposite way for the same reasons. The attitudes they bring into the classroom about commercial TV are frequently negative because they are mature and well-educated. If their experience with classroom I.T.V. - and the progress and attitudes of their students are benign, they usually tend to change their viewpoints from initial hostility to acceptance and interest in I.T.V. as a teaching device.

Classroom television is not a religion, a cause, a curriculum, a course of study, or even a method of teaching. To argue "for" or "against" it is absurd. Classroom television is today - and will become more so in the future - a process with educational promise. That promise was not realized in this study.

## Chapter V

## Summary, Recommendations and Conclusions

Summary

This study explored the relationship between the medium of television and the school. Identifying major educational issues and movements and presenting diverse utilization strategies, this study has shown how education can organize classroom activities so students may develop skills in comprehending instructional television.

The nature of research dictates that investigation confine themselves to very specific areas. Television, however, as a medium of communication and delivery system cuts across the entire spectrum of organized knowledge and human experience. Hence this study made a conscious effort to take a wholistic approach in defining instructional television and its relationship to the institution of schooling. The study concentrated on one area of television utilization, instructional television. When synthesizing the evidence gathered from a review of the literature and research on television and its impact on children, the author concluded that schools should provide opportunities for students to experience the media of I.T.V.

Research and Literature.

The multifarious nature of television has impeded the

growth of a unified educational movement and has hindered the development of school practices which are sorely needed. Symposiums and conferences on television and its use by schools are burdened by splintered interests, jargon and lack of agreement on how to proceed. Issues are further confused by the ongoing debates and arguments among the television industry, the federal regulatory agencies and other organizations over the interpretation of laws, rulings, regulations and research.

New technological developments continue to transform the television industry. Home video, records, video cassettes, video disks, video games, satellite transmissions and two-way interactive cable make it imperative that students develop information skills to critically select television fare to meet their educational needs.

Television has not played a central role in most schools. Bloom (1984) reminds us that "print did not raise the intellectual standards of living just because it was invented; but because it was used by educational institutions such as schools and promoted by cultural agencies such as libraries and publishers". It is time for television, as a major communication mode and its ability to educate, to become an integral part of the school program. The panel investigating the scholastic aptitude test score



decline which cited television as one of several factors contributing to the decline, concluded nonetheless, that television and related forms of communication give the future of learning its largest promise.

The number of educational television programs is expanding at a very rapid rate. High school government classes already have the capability of viewing congressional hearings and debates from Washington, D.C., as well as taking advantage of satellite broadcasts on current and world developments.

#### Project Results.

This study assessed the first year of instructional television in two small rural elementary schools in Bond County, Illinois. Specific questions investigated were: (1) the effectiveness of instructional television in increasing student GPA's; (2) the opinions of students on the effectiveness of ITV; and (3) the opinions of teachers on the effectiveness of ITV. Data was collected via student pre and post GPA scores and student and teacher surveys concerning their level of satisfaction with the project. Results indicate that: (1) students participating in the instructional television project reacted positively to the medium; (2) no significant academic gains resulted from the I.T.V. experiment; and (3) teachers indicated (a) wide variance in the extent I.T.V. was used; (b) I.T.V.

scheduling continued to be the most serious problem; and (c) their attitude toward I.T.V. is generally positive.

#### Recommendations for Further Research

In light of the evidence presented in this study, there are several areas where research is needed to provide guidance for educators. The following recommendations are offered:

1. Use of instructional television only in mathematics and science where it was generally perceived as successful by students.

2. The student math and science progress be monitored to ensure that the practice of instructional television useage does not negatively impact student achievement.

3. The use of instructional television continue at Bond County Elementary schools with expanded time allotments and expanded use of pre and post I.T.V. viewing materials to participating classes.

4. That I.T.V. not be expanded to other academic areas as the student survey indicates lack of I.T.V. success in other academic areas.

5. The utilization of achievement test results in determining I.T.V. impact on students.

#### Recommendations for Educational Practice

This study was primarily intended to improve educational practice. The following recommendations are

offered to provide direction for Bond County School District #2 in utilizing instructional television to its maximum effectiveness within the school program:

1. Teachers in the elementary schools should regularly review available I.T.V. series and their accompanying materials to enhance the schools' existing curriculum.

2. Teachers should regularly review professional journals containing reports of new uses of instructional television within the school setting.

3. A regional clearinghouse for television utilization should be created to provide information about resource personnel and materials, model programs, cooperative ventures and funding alternatives.

4. Visual and critical viewing skills should be included with reading, writing, speaking and listening in the definition of basic communication skills.

5. Greater use of videotape equipment as a teaching and learning resource.

6. Institutions of higher education with communication departments and television production facilities should develop cooperative arrangements with elementary schools, especially those with mass media curricula and production facilities.

7. Video essay contests and competitions for elementary and secondary students should be regularly

sponsored by local, county and state organizations.

### Conclusions

Future research should focus on necessary characteristics of instructional methods and other variables (task, learner aptitude, and attributions), which are more fruitful sources for understanding impact on achievement. Recent studies dealing with learner attributes and beliefs about the instructional and entertainment qualities of different media seem particularly attractive as research directions. There are no media variables in attribution research, however. Independent variables are concerned with learner beliefs, and outcome measures are typically some measure of learner persistence at a task. It seems reasonable to recommend, therefore, that researchers refrain from producing additional studies exploring the relationship between media and learning unless a novel theory is suggested.

Television has become the nation's most important communication instrument, simultaneously reflecting and shaping cultural values. Schools must offer students the opportunity to become critical consumers of television as well as developing skills to communicate effectively through the medium. Tomorrow's adults must be prepared to use television in new ways which will be dictated by rapid technological changes. Instructional television offers

elementary students in the Bond County District #2 an educational program for the electronic age without abandoning the practice of traditional print skills. The school is the logical choice to provide the leadership for such a movement; it has available students, time, facilities and potential local funding sources once the programs are established.

Economic conditions make it difficult for local school boards to initiate programs, especially in the State of Illinois where legislation places severe limitations on the increases of local budgets. I.T.V. in Bond County District #2 elementary schools was designed as a one year project with an option for a second year. The basic funding, shared by the Board of Education and Regional Superintendent of Schools, was for beginning costs and seed money to: (1) implement the instructional television programs; (2) establish the organizational structure; and (3) purchase of equipment.

## References

- Ackerman, J. and Lipsitz, L. (Eds.) (1979). Instructional Television: Status and Directions. Englewood Cliffs, N.J.: Educational Technology Publications.
- Akiyama, T. (1983). Research on School Television in Japan, 1953-1983. Tokyo: NHK RTCRI
- Akiyama, T., Imaizumi, S., and Inoue, M. (1983). Broadcasting and School Education in Japan. Tokyo: NHK RTCI
- Allen, D. W. (1980). Education and Technology: The Changing Basics. Educational Technology, 1 (223), (p.47).
- Aversa, F. and Morrison, G. R. (1978). Toward A More Precise Definition and Evaluation of Televised Educational Programming. Educational Technology, 18 (8), (pp. 5-11).
- Bloom, B., Hastings, J. and Madaus, G. (1971). Handbook on Formative and Summative Evaluation of Student Learning. New York, N.Y.: McGraw-Hill Book Co.
- Bloom, R. (1984). Teaching By Television: An Instructional Alternative. Business Education Forum, 15 (320), (pp.5-6).
- Briggs, Leslie, J. (1980). Thirty Years of Instructional Design: One Man's Experience. Educational Technology, 5 (218), (pp. 45-50).
- Burns, Richard W. (1977). Instructional Television, Interaction and Learning Objectives in Instructional Television. Ackerman, J. and Lipsitz, L. Ed. Englewood Cliffs, N.J.: Educational Technology Publications.
- Cagne, Robert M. (1980). Educational Technology in Phase? Educational Technology, 71 (113), (pp.7-14).
- Cantor, J., and Reilly, S. (1979). Jocular Language Style and Relevant Humor In Educational Messages. Paper presented at the Second International Conference on Humor, Los Angeles, CA.
- Chapman, A. J. and Crompton, P. (1978). Humorous presentation of material and presentations of humorous material: A review of the humor and memory literature and two experimental studies. In M. M. Gruneberg, P. E. Morris, and R. N. Sykes (Eds.), Practical Aspects of Memory (pp. 84-92). London: Academic Press.

- Chodsi, S. (1982). To Express Today's World We Use Yesterday's Language. Educational Media International. No. 4.
- Chu, G. C. and Schramm, W. (1968). Learning From Television:What The Research Says. (Rev. Ed.) Washington, D. C.:National Association of Educational Broadcasters.
- Compstock, G. (1977). The Second Teacher:Recent Research on Television. National Elementary Principal, 37 (391), (pp.16-21).
- Curtis, J. A. and Beidenbach, J. M. (1979). Educational Telecommunications Delivery Systems. Washington, D. C. American Society For Engineering Education.
- Davies, A. P., and Apter, M. J. (1980). Humour and its effect on learning in children. In P. E. McGhee and A. J. Chapman (Eds.), Children's Humour (pp. 237-253). Chichester, England: Wiley.
- Decker, R. (1985). The Role Of Technology In Education. NASSP Bulletin, 69 (484), (pp. 2-6).
- Dwyer, F. M. (1978). Strategies For Improving Visual Learning. State College, PA:Learning Services.
- Erickson, Carlton W. H. and Curl, D. H. (1972). Fundamentals of Teaching with Audiovisual Technology. Second Edition. New York:MacMillan Company.
- Friedlander, B. A. (1976). Instructional Television:An Agenda For Self-Analysis In The Future Of Public Broadcasting. (Ed. by D. Cater and M. Nyham, N.Y. Praeger.)
- Goldberg, M. and Harvey, J. (September, 1983). A Nation At Risk:The Report Of The National Commission on Excellence in Education. Phi Delta Kappan, 27 (676), (pp.14-18).
- Gordon, G. N. (1970). Classroom Television - New Frontiers in I.T.V. Communication Arts Books.
- Gough, P. B. (September/October, 1977). Instructional Television's Time Has Come. Journal of Teacher Education, Volume XXVIII, (pp.32-36).

- Hauck, W. E., and Thomas, J. W. (1972). The relationship of humor to intelligence, creativity, and intentional and incidental learning. Journal of Experimental Education, 40, 52-55.
- Lesser, G. (1972). Assumptions behind the production and writing methods in "Sesame Street". In W. Schramm (Ed.), Quality In Instructional Television (pp. 108-164). Honolulu: University Press of Hawaii.
- Lesser, G. S. (1974). Children and Television: Lessons from Sesame Street. New York: Random House (p. 257), citing Edward R. Murrow.
- McDaniel, T. R. (1982). Teaching Television Literacy To Teachers. Educational Technology, 4 (137), (pp. 13-16).
- McGovern, J. (1980). Video Use In English Language Teaching. Educational Broadcasting International, 19 (79), (pp. 126-128).
- Palmer, E. (1978). The Electric Company and The School Marketplace. In Carlisle, R. (ed.) Patterns of Performance In Public Broadcasting and Education:1976-78. Washington, D.C.:Corporation For Public Broadcasting, 27 (391), (pp. 127-136).
- Prange, W. W. (1973). Educational Technology! We Need A New Approach. Public Telecommunications (pp. 12-16).
- Riccobono, J. A. (1983). School Utilization Study: Availability, Use, and Support Of Instructional Media. Education Technology, 29 (391), (pp. 17-23).
- Schramm, W. (1977). Men, Messages, and Media:A Look At Human Communication. New York:Harber and Row.
- Stoloff, D. (1983). Four Models For Viewing Television and Their Implications For Educational Planning. Educational Technology, 30 (7), (pp.10-16).
- Tieng, D. (1983). Japan Sets The Pace In Educational Television. Educational Technology, 23 (5), (pp. 18-22).
- Wakshlag, J. J., Day, K. D., & Zillmann, D. (1981). Selective exposure to educational television programs as a function of differently paced humorous inserts. Journal of Educational Psychology, 73, 27-32.



- Zillmann, D. (1982). Television viewing and arousal In National Institute of Mental Health (Ed.), Television and Behavior: Ten Years of Scientific Progress and Implications for the Eighties: Vol. 2. Technical reviews (DHHS Publication No. ADM 82-1196, pp. 53-67). Washington, D.C.: U. S. Government Printing Office.
- Zillmann, D., and Bryant, J. (1983). Uses and effects of humor in educational ventures. In P. E. McGhee and J. H. Goldstein (Eds.), The Handbook of Humor Research: Applied Studies of Humor (pp. 173-193). New York: Springer-Verlag.
- Zillmann, D., Williams, B. R., Bryant, J., Boynton, K. R., and Wolf, M. A. (1980). Acquisition of information from educational television programs as a function of differently paced humorous inserts. Journal of Educational Psychology, 72, 170-180.