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CLOSING THE GAP - RESEARCH AND PRACTICE.

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EXAMPLES OF SIGNIFICANT FINDINGS FROM RESEARCH STUDIES OF LEARNING FROM MEDIA WERE CITED THAT HAVE BEEN IGNORED OR OVERLOOKED BY PRODUCERS OF INSTRUCTIONAL TELEVISION. CAUSES FOR THESE GAPS BETWEEN RESEARCH AND PRACTICE WERE DISCUSSED, AND CERTAIN SOLUTIONS WERE OFFERED IN AN ATTEMPT TO ELIMINATE THE GAPS. THE AUTHOR URGED THAT ALL PRESENTLY AVAILABLE, PUBLISHED RESEARCH FINDINGS BE MADE ACCESSIBLE TO EVERYONE INVOLVED IN INSTRUCTIONAL TELEVISION. A BIBLIOGRAPHY OF TITLES, AUTHORS, AND ORIGIN LOCATIONS OF ANY PUBLISHED OR UNPUBLISHED RESEARCH OR REPORT SHOULD BE COMPILED. IN ADDITION, RESEARCH SHOULD BE MORE UTILITY ORIENTED TO PROVIDE MORE RESEARCH OF THE SORT MOST HELPFUL TO THE PRODUCER AND TEACHER. A TAXONOMY OF TELEVISION SIGN SYSTEMS AND A TAXONOMY OF TV PRODUCTION ELEMENTS ARE ATTACHED TO THE REPORT. THIS PAPER WAS PRESENTED TO NATIONAL ASSOCIATION OF EDUCATIONAL BROADCASTERS (MIAMI UNIVERSITY, OXFORD, OHIO, MARCH 22, 1965). (GD)

# CLOSING THE GAP - RESEARCH AND PRACTICE

(Paper read at the Region III Seminar,
National Association of Educational Broadcasters,
Miami University, Oxford, Ohio
March 22, 1965)

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# CLOSING THE GAP - RESEARCH AND PRACTICE*

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I wish to thank Professor Ewing and the program committee for inviting me to speak to you this morning concerning the gap which exists between research and practice in the most important field of Instructional Television. I am particularly pleased to share the platform with such a distinguished colleague as Professor Egon Guba of the Ohio State University.

My own vantage point in looking into this area is based on a combination of factors. First, I can see the problem as one who is administratively responsible for the development and production of ITV course materials. Second, I can see the problem as one who directs the research of graduate students in this area; and third, there is even another viewpoint available to me as one who teaches in this area.

## THE PROBLEM:

Before addressing myself to some solutions for "Closing the Gap", let me document the fact that indeed the gap does exist. How does one know that there is a gap between television producers and media-learning theory researchers? As one who has labored in this field for the entire course of its short existance, I have been in the position of having almost daily contact with the ITV product and the published and unpublished research related to it. It is very simple. The principles stated and documented in the research to date are in large part missing in the lessons or course materials being utilized. Within the past decade, I have seen the ITV product of most every institution represented at this meeting.

Since last Fall when I agreed to deliver this paper, I have paid particular attention to a given set of known production findings, known at least to any seminar students of mine since 1958. Some of these findings were not demonstrated in the many lessons I have viewed this past six months. Let me point out some specific examples. I would point out, however, that this is not intended to be a validation of the reliability of the specific studies involved. It is only intended to point out that these studies do exist, and they have been ignored or overlooked by those who produce for ITV.

* Paper read at the Region III Seminar, National Association of Educational Broadcasters, Miami University, Oxford, Ohio. March 22, 1965.

1. According to M. D. Vernon who reported in the British Journal of Psychology, 44 (1953), vivid film excerpts focused undue attention on specifics and interfered with generalizations. In that same study he found that important statements involving generalizations essential to the main argument are less likely to be remembered if at the end of a program.

2. Billie J. Fullerton in his doctoral dissertation at Oklahoma University, (Ed. D - 1956) demonstrated that anticipatory or preview type remarks given just prior to an instructional film, significantly reduced both the acquisition and the rentention of the facts in the film. Without exception, every instance of film usage within an ITV lesson which I have seen this past six months has utilized the anticipatory remark and thus ignored Dr. Fullerton's findings.

   (By the way, you might be interested to know that that same study demonstrated that Black and White is "significantly superior" to color on measures of acquisition and retention of facts related to a general orientation subject.)

3. Nathan Jaspen reported in a U.S. Navy Special Devices Center publication (SDC 1950) that the presentation of errors which are then pointed out has significant value in learning.

4. Kales, S.V., Grosslight, J.H., and McIntyre, Charles. pointed out in another SDC (1955) report that requiring subjects to pronounce Russian words after the teacher presented them, inhibited their comprehension learning of that language.

5. John Mercer in his doctoral dissertation at the University of Nebraska (Ph. D. 1952) demonstrated a slight increase in learning when video transitions - e.g. fades, wipes, and dissolves, were eliminated.

6. How many times have I heard a TV teacher say, "Now children, you try an example on your papers. See if you can work this problem. Raise your hand when you think you have the right answer." Then the teacher waits an appropriate amount of time before giving the correct answer. Every producer-director guilty of permitting this pedagogical procedure can not be aware of a study by Kimble, G.A. and Wulff, J.J. who reported in the Audio-Visual Communications Review 1, (1953) that there is a significant increase in the acquisition and retention of the process or procedure being learned if there are periodic audio and video cues given which lead the viewer to the correct response.

7. In terms of thelength of video lessons, no one seems to be aware that Hard, C.G. and Watson, D.P. reported on this subject in Science Education 39, (1955). They found no change in the percentage of the recall of scientific terms between lessonsof 15 minute duration with 15 terms, or 19 minute duration with 20 terms, or 24 minute duration with 25 terms. This at least questions the current in-school optimum lesson length of fifteen or twenty minutes.

8. Let me give just one more though this by no means exhausts my list. This concept deals with the notion of the use of the "review" in the lesson to enhance learning. Some producer-directors apparently are not aware that Miller, J., Levine, S., and Kanner, J. reported in Audio-Visual Communications Review 1, (1953) that a single mass review at the end of a lesson produced significantly greater learning than having two "spaced" reviews within the lesson.

It must be clear to you as it is to me that the results of these particular research projects are generally not incorporated in our ITV product. In fact, quite often the case is just the reverse of the findings stated. Let me add just a bit of salt to the wound. Of the findings to which I have referred, not one has existed less than nine years.

THE CAUSES:

The question now comes to mind, "Why does this gap exist? I see five reasons:

1) Number one is a problem of linguistics. Researchers in this field do not speak English of the type meaningful to producer-directors. For example, producer-directors do not understand television to be "a two dimensional mosaic, multi-channeled medium employing multiple sign-system modalities. Faced with the erudition of terminology and the precision of methodology developed by the physical scientist, the educational-social- or behavioral scientists have been driven by some sort of academic guilt complex to engage in mounting a defense of their reputation based on a system of intellecutalized phonetics. The communication result is much the same sort of thing as I have just engaged in here. What I was really saying was that educational researchers feel the necessity to sound intelligent. Of course, the truth of the matter is that this has no relationship to the value or validity of their work. Personally, I believe their linguistic defensiveness to be unwarranted, unnecessary and in fact detrimental. For the most part, their work and their methods are good. They are in a sense better than their physical oriented colleagues because their problems do not contain the regularity and the orderliness of being able to put so many H's and so many O's together and know that it definitely will come out wet.

2) Secondly, I think the researchers I have read or with whom I have met suffer from a complex known as the Ph. Dicty syndrome. It is the result of subconscious psychological scars received at the birth of their degree during that final and decisive labor pain known as the doctoral oral. The result seems to be to tranquilize one's self with the popular current drugs NSD (no significant difference) or NAP (no applicable principles). After prolonged dosage, researchers are not only unwilling to say anything "for sure", but they even become unwilling to suggest what a producer or a teacher ought to "do." In fact, some I know couldn't care

less about what is done in relation to what they have found. At this point, we are not talking about a gap; we are talking about a wall.

3. A third cause of the problem exists within the general attitude present so often in learning research people, an attitude developed from the first two causes suggested above. If a television producer-director does wade through the data and polysyllabic terminology, he may extract from it a principle he can apply in the studio. He then translates that research into the following: "Don't use too many examples to illustrate a point or you'll confuse the kids."

   In the prescence of this summary, the automatic defenses of the researcher are immediately brought into action. He cannot allow his year with 1/2 release time, aided by three graduate assistants and a five figure account at the computer center to be reduced to such a sentence. Probably with facial and vocal disdain, he will say patronizingly, "No, I'm afraid it's not that simple. You and I will have to sit down and talk this over, though at the moment I can't take the time." Then he really goes into gear and destroys all communication with the operational field by saying, "However, I can see where you might get the idea that our analysis of variance data tends to support the hypothesis that beyond certain parameters there exists a direct correlation between the quantitative level of relevant audio-visual reinforcement elements and the level of cognitive dissonance present during the decoding process." Unfortunately, our producer-director will probably never know that that could mean, "Don't use to many examples to illustrate a point or you'll confuse the kids."

4. The above stated cause leads me to another. I refer to the attitude and preparation of producer-directors in this field. The above hypothetical encounter would probably arouse the defensive mechanisms common to all those who produce, create, or operate in a product-oriented discipline. He would immediately relish the prospect of casting the theory oriented researcher into his own problem and production oriented role. He would probably mutter to himself or a compatriot, "He uses big words, but I'd like to see him in the hot-seat with a recording deadline on his back. He wouldn't last five minutes!" Probably true, but totally immaterial. This does not lessen the responsibility of the ITV producer-directors to see their role as an educator working in a team teaching situation. I sincerely believe that an understanding of production concepts and a capability to manipulate the elements of the medium are not adequate preparation for teaching in the ITV field. I use the term "teaching" intentionally for until ITV producer-directors understand that this is what they are engaged in, this instrument of education and research will never fulfill its destiny. The man who says, "I haven't got time to learn this, I've got a program to cut", is at once a self-contradiction.

People in this field must take graduate work in fields such as human learning, educational psychology, communications theory, teaching methodology, and the like. I also believe they should have some teaching experience, particularly at the level of their ITV involvement. The researcher castigated previously in this paper should not be put in the position of having to translate his findings into academic monosyllables. This is not only expecting too much, but it will actually distort his findings. The communicative gap between research and practice is the result of faults on both sides. There is a need for a half-way meeting here, and the ITV production people must prepare themselves to be able to make that meeting. Most people in this field are located where they can get the preparation if they are willing to put in the time and energy. Personally, I have no intention of hiring a full-time person to do this work at Wisconsin unless he has completed the Ph. D. (or at a minimum the academic work toward the Ph. D.). I feel just as strongly about the need for the Masters degree (particularly with an Education orientation) for those who deal with elementary and secondary levels of ITV.

Of course, the degrees do not insure solving the problem described above. I would hope, however, that in the process of obtaining those degrees, one would develop the inquiring attitude which would require him to stay abreast of his field by reading the right journals and seeking out findings before beginning a production. It is painfully evident in my viewing experience that most ITV producer-directors begin at Genesis everytime without really looking into what has been done or what has been learned about the particular type of teaching being attempted. To continue the analogy, I might say that we will never reach Revelations with this approach. Believe me, I do not cast stones because I am without sin. In the very television unit for which I am responsible, a fine young producer-director waded into a Typing by Television series without looking into at least the dozen NAEB Journal fact sheets generally related to this, or the fine Ph. D. dissertation on this subject done by William Pacewark (N.Y.U., 1956). I can cite other examples for all our producer-directors. Limitations in time and academic preparation result in this approach.

5. Last and possibly the most important cause for the gap is that not enough research has been done in the area of production variables and their effects upon concept learning. This is probably due to the complexity and quantity of the production variables in a televised lesson, and our inability to hold those variables constant in order to manipulate a few under experimental conditions. To give you an idea of the quantity of production elements involved, I have prepared for you a "Taxonomy of TV Production Elements" containing eighteen categories which sub-divide into some one hundred and ten elements. Many of you would provide variations of terminology for such a taxonomy but not much could be done to reduce the quantitative dimension.

The result is that of 261 abstracts of research findings in the NAEB Fact-Sheets service, only 23 report on studies related to production techniques. Of these, only four have been produced in the last five years; and the latest report covers a 1961 study.

SOLUTIONS:

Having demonstrated the existance of the problem and indicated the probable causes, it now becomes my task to suggest some solutions. I believe there are three steps to be taken, and I give them to you in the order of their ease of achievement.

I. The first move towards an effective solution is to urge that immediate steps be taken by administrators and producer-directors alike to see that presently available information be gathered together as a personal resource for each person involved. If the institutional budget cannot provide this, then it becomes the professional necessity of each producer-director of ITV to purchase these sources like any skilled person who maintains the tools of his trade. Let me list for you a basic library which each one should have at his fingertips in his office.

   A. The NAEB Research Fact-Sheets: You can obtain a bound copy of all of them to date and then keep current with your Journal subscription.
   B. A Bibliography of Dissertations and Theses in Radio & TV: Published by Syracuse University.
   C. Abstracts of Research in ITV and Film: Two volumes by MacLennan, D.W. and Reid, J. C., published by the Stanford Institute for Communications Research.
   D. An up to date file and regular subscription to Audiovisual Instruction and Audio-Visual Communications Review.

2. My second step toward an effective solution will take a bit longer to achieve but it is in progress. Under the auspices of the University of Wisconsin Learning Research and Development Center and the Biblio-Center of the University of Wisconsin Speech Department, I am collecting with the help of two graduate research assistants the titles, authors, and origin locations of any published or unpublished research or report dealing with ITV or instructional film. At the moment, we have upwards of 5,000 titles. We are also making progress in developing a workable set of research categories so that a producer-director can easily locate the title of any studies which are related in part to his immediate production problem. Of course we are grappling with the age-old bibliographical indexing problem of finding the optimum point between a classification system with so few characteristics that it is too gross to be of any value and a classification system with so many characteristics that it requires a computer to retrieve the stored information.

I believe we are on the right track in our ITV Bibliographic Project; and if financial support continues we may be able to provide you with a first-class resource by 1967. The main thrust of this project is utility. Our assumption is that ITV producer-directors will utilize what already exists by seeking the report out if they can be made aware of the existance of the information in an easy and readily available fashion. I hope we can make this contribution.

3. The last step towards an effective means to close the research-practice gap is to provide more research of the sort most helpful to the producer and the teacher. We really know very little about the relationship between the characteristics of the medium and the process of concept learning. With a decade having passed one might reasonably ask, "Why?"

I believe I have already answered that question in my fifth reason for the causes of the research gap. In part, the multiplicity of production elements have served to make us avoid this area of research. However, some recent ideas of Bloom at Chicago, Travers at Utah, and Westley at Wisconsin, have led my thinking into another area. I now suspect that we are research the wrong elements when we experiment by manipulating variables such as those listed in the "Taxonomy of TV Production Elements" attached to this paper. To return to my old scholastic home of Persuasion and Rhetoric, we might be in the same position as one who would experiment with variations of the lips, teeth, tongue, jaw, soft-palate, and glottis to determine the affects upon persuasion of a listener or information transfer. In fact, a comparable kind of situation did develope in the Speech field with all of the DelSartian attempts to analyze and classify specific areas and kinds of gesture as they related to the communication process.

In Speech, they have come to understand that it is variations in the product of these production variables which need to be researched to determine then their affect upon the listener, receiver, or decoder if you prefer. The same is true with our TV production variables. It is really the product of these which needs research. Without elaborating, I suspect the same comparison can be made about much of the subject-oriented ITV research. As in Speech, it was not necessary to look for principles which applied to specific speech topics. Instead they have found principles which apply to the speech process itself with some division into a few types of communication goals.

A PROPOSAL:

Therefore I propose a different basis for our research in this area. Let us, like Speech, research the product of what we call production variables. I refer of course to the TV screen or picture. Let us view this as the encoding process in an information processing context. Some of the existing studies have in reality already done this without stating or realizing the fact.

The first task then is to isolate and identify the languages involved in a television lesson. What different kinds of languages can be used to facilitate concept learning via television? In general we have available almost all the languages of communication present in a face to face confrontation plus those which are inherent or intrinsic to the instrumentation of the television medium.

The next question is to determine if these are languages, and thus have a sign system or vocabulary as well as a syntax or grammar. Since one can not readily see a syntax or grammar, we must for the moment assume that television has only vocabularies or sign systems to be more accurate.

Therefore, I have proposed a "Taxonomy of Television Sign Systems" which is also attached to your copy of this paper. I have divided these systems into Audio Modes, Visual Modes, and Intrinsic Instrumental Modes with the Visual Modes separated into human and non-human visuals. Let me ask each of you to help me refine this taxonomy, both from the standpoint of completeness and mutual exclusiveness as well as from the standpoint of meaningful terminology. For example, instead of audio semantics in item 1.10, we should simply call this "speech" or "phonetics", or "the spoken word." Whatever it is called, the term must be meaningful and usable in an experimental sense. It can not have a connotative or denotative quality which blends over into another sign system designation. I welcome your help and look forward to receiving some suggested changes in the near future.

The experimental procedure would be one in which we would compare two of these sign systems to determine their level of efficiency in communicating concepts. This would be done by eliminating and/or holding constant all the other sign systems. This would <u>not</u> be done while producing a lesson in arithmetic or biology or any other kind of lesson. By this approach in most of our studies to date, we have not had truly controlled experimental situations; and in fact, have been much like a mechanic trying to repair an automobile while it is being driven about.

I suspect we are talking about short and simple television units which attempt to create learning about a concept. Obviously, I am talking about non-acceptable television from a standpoint of aesthetics or a finished product. If one were to compare 2.20 (graphs) with 2.40 (models) for example, he might be able to eliminate all the other modes with the exception of a few. Eliminating all audio modes would be easy, just cut the microphones. You could probably eliminate all of the other Visual: non-human modes with the exception of 2.60 (lighting). Obviously, you can eliminate props and background set; but you can not eliminate lighting; or you would have no picture. Therefore, you make certain that the sign system of lighting is held constant. Since variations in lighting do communicate different things, you can see that it is a sign system of television which carries part of the message, or one of the messages. One would then continue down the taxonomy either eliminating a system or holding it constant.

The end video products of this procedure would then become the independent variables in the study. The next task is to devise a standard testing procedure to be used when all of these modes are intercompared as well as tested for the

affects of various combinations and quantities. By gathering this data together and with the aid of a computer we could produce television learning models based on an information processing approach to concept learning. These models would enable all of us to produce an ITV course material without relying so heavily on inate production capabilities and sensitivities. We would know what a given lesson would do. We would know that it was the best way to do a certain lesson according to the most current information. Lastly, we would know what and how much to add to gain a specific learning result.

What I describe is the optimum situation where television is involved in concept learning. We would then have enough of a "science" to move ultimately into the area of learning efficiency in which learning must be related to the amount of time necessary to arrive at a predetermined level of comprehension.

THE NATIONAL APPROACH:

We could wait for one researcher and one production unit to do all the work necessary in this proposal, but why wait? We have a national organization and they have been given the funds recently to support a project of this magnitude. The NAEB can create and support a team involving top information theorists, top research designers, top test designers, top data analysis people, and evena top writer to get this out to all of us. The only ingredient I obviously haven't mentioned is the force necessary to produce all the simple video learning units representing each mode in the taxonomy.

The answer is imple, the institutional members of this division of the NAEB can supply that part of the project, and it won't take three years either. This organization has access to the pecple necessary to mount a massive nationwide assault on this problem. We also have the leadership necessary to carry it out to a successful conclusion.

This is the approach the field of Medicine has used so successfully - isolate the sickness, and then go after it on a national scale. This is a procedure worthy of a science laboratory. We will never be a science in the same sense as Chemistry or Physics, but the time has come for us to move farther away from the show business heritage and move closer to the science laboratory.

Thank you.

####

# TAXONOMY OF TELEVISION SIGN SYSTEMS

L. S. Dreyfus

1.00 Audio Modes:

1.00 Audio Modes:

- 1.10 audio semantics
- 1.20 music
- 1.30 sound effects
- 1.40 noise

2.00 Visual: non-human modes:

- 2.10 orthographics
- 2.20 graphics
- 2.30 numerics - charts, tables and formulae
- 2.40 models
- 2.50 abstract and real objects
- 2.60 set - prop, background, and lighting
- 2.70 animation
- 2.80 line - frame & focus
- 2.90 chromatics

3.00 Visual: human modes:

- 3.10 personality - human gestalt
- 3.20 gesture and movement
- 3.30 tutorial mode - aud. contact
- 3.40 viewer movement - by camera selection and movement

4.00 Intrinsic Instrumental Modes:

- 4.10 transitions - laps, cuts, diz.
- 4.20 focal selection and intensity
- 4.30 time - stop motion and sequence condensation
- 4.40 video effects
  - 4.41 reversion
  - 4.42 inversion
  - 4.43 split screen and montage
  - 4.44 superimposition
  - 4.45 matting amplification
- 4.50 texture
- 4.60 tempo

# "A TAXONOMY OF TV PRODUCTION ELEMENTS"

Meredith A. Church and Lee S. Dreyfus

A. Camera

1. single/multiple
2. vidicon/I-O
3. camera movement
   a - pan/truck/dolly
   b - tilt/zoom
4. low/high pedestal
5. depth of field
6. framing

B. Color/Black and White

C. Direction

1. composition
2. use of CU's
3. timeing/pacing
4. co-ordination of production elements
5. use of cameras (see A)
6. cutting techniques
   a - cut/fade/dissolve/dissolve-out-of-focus/wipe

D. Sound

1. type of microphone
2. live sound
3. recorded sound
   a - records
   b - electrical transcriptions
   c - audio tape
   d - video tape
   e - film
4. sound dubbing
5. no sound
6. use of music

E. Lighting

1. for dimension
2. for realism
3. for mood
4. key/flat lighting
5. available lighting

F. Scenery
   1. realistic/suggestive
   2. unit sets
   3. background
      a - cyclorama
      b - drapes
      c - photomural
      d - rear projection
   4. no set

G. Props
   1. realistic/suggestive

H. Graphics
   1. on set/ off set
   2. non-moving
      a - title cards
      b - illustrations
      c - photographs
      d - slides
      e - maps
      f - charts
      g - balops
      h - chalkboard
      i - magnetboard
   3. moving
      a - motion picture film
            - silent
            - sound
            - shot specifically for lesson/available film
   4. size
   5. amount of information
   6. style
   7. attention area
   8. size and type of area
   9. color and grey scale
   10. artist-created/teacher-prepared

I. Special Effects
   1. electronic effects
      a - supers
      b - wipe
      c - split screen
      d - matting
      e - polarity reversal
   2. optical effects
      a - rear projection
      b - front projection
      c - mirrors
      d - gobos
      e - defocus effects
      f - animation
      g - crawls
   3. mechanical effects

J. Film
   1. 16 mm/ 35 mm/ 8 mm
   2. sound
      a - magnetic
      b - optical
      c - dubbed
      d - single/double system
      e - voice over
   3. silent
   4. speed of projection
   5. editing
   6. projection equipment
   7. slides
   8. kinescope
   9. positive/negative

K. Video Tape
   1. helical scan
   2. quadrature
   3. speed
   4. editing
      a - electronic
      b - mechanical

L. Remotes

M. Performance
   1. direct communication/eye contact
   2. psychological size of audience
   3. blocking
   4. changin cameras
   5. clear speech
      a - regional dialect
      b - speech defects
   6. timing/pacing
   7. prompting
   8. dramatization

N. Make-up

O. Clothing

P. Technical Quality (see A,C,D,I,J)

Q. Teacher-operated Production
   1. operation of camera (remote control)
   2. operation of audio (remote control)

R. Presence of Peer Group models on the program.