DOCUMENT RESUME

ED 093 387 IR 000 895

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TITLE Instructional Television in Higher Education.
INSTITUTION Indiana Univ., Bloomington.
PUB DATE Jan 74
NOTE 11p.; Paper presented at the Conference on Cable Television and the University (Dallas, Texas, January 29-31, 1974)
AVAILABLE FROM Proceedings of the Conference on Cable Television, EDUCOM, P. O. Box 364, Princeton, New Jersey 08540 ($6.00)

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Cable Television; Closed Circuit Television; *Educational Development; *Educational Television; Programing (Broadcast); *State of the Art Reviews; Televised Instruction; *Television Research; *Universities

ABSTRACT

Despite the voluminous array of comparison studies, educators have little for purposes of administrative decision making or for the establishment of scientific generalizations about how students learn from television. Of interest to cable adherents is the off-campus home viewer of instructional television (ITV) offerings. Research evidence indicates that at-home TV students tend to perform better than their on-campus counterparts and they frequently have a more favorable attitude toward learning via the TV. Cable offers at least two technical capabilities which are unique to cablecasting: (a) multiple channels for simultaneous communication with multiple small audiences; and (b) two-way interaction between the teacher and the learner. However, these opportunities can also be seen as problems. First, multiple-channel opportunity evokes educational TV's historical inability to produce sufficient software to fill the existing, limited channels. Second, the opportunity for two-way interaction is clouded by the rather obvious failure to date to identify and perfect teaching methods which captialize on this capability. In essence, educators must decide what it is we want cable to do for our institutions. (WCM)

ED 093387

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Instructional Television in Higher Education

by Michael Molenda

INSTRUCTIONAL TELEVISION IN HIGHER EDUCATION

This paper will deal, from the educator's viewpoint, with the specifically *instructional* applications of television -- what higher education institutions have been doing with TV, how successful their usage has been (according to the findings of instructional TV research), and how these practices and research findings may relate to cable TV.

This will be a quick overview of a very broad universe. Let's begin by surveying the major *modes* in which TV is utilized in higher education:

- *Broadcast* -- Beginning with the commercial networks' carrying "Continental Classroom" and "Sunrise Semester" in the 1950s, we have come today to the point that at least 42 higher education institutions operate some 60 broadcasting stations in the VHF and UHF bands. The primary role of most of these stations is that of a public television outlet, transmitting the resources of the university to off-campus audiences. They typically carry instructional programming for the elementary and secondary school levels, plus programs of general cultural or educational interest to the local community.
- *Microwave* -- In addition to conventional broadcasting channels, some dozens of other institutions use the more specialized Instructional

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Television Fixed Service (ITFS) and microwave frequency bands to reach specific off-campus groups which are especially equipped to receive these signals. One of the best-known and most active examples of the latter is the TAGER microwave network, headquartered in Dallas, which facilitates sharing of resources among nine colleges and transmits graduate engineering classes to on-the-job workers at several neighboring industrial plants.

- *Closed-Circuit TV (CCTV)* Even more widespread than either of the above modes, though, is the practice of conveying regular coursework to on-campus students through local cable lines which may interconnect two rooms in the same building, several different buildings, or the entire campus.

  The installation of CCTV systems appears to have progressed steadily from the early 1950s through 1972, doubling in numbers approximately every five years. (See Figure 1) A survey by the Great Plains National ITV Library (1972) located some 725 CCTV systems in higher education. My guess is that this growth has probably reached a plateau at this time. There are not that many colleges left which could support a wire-up which have not done so already. Besides that, many of the functions which CCTV originally served are now fulfilled by competing delivery systems such as microwave, portable video tape units, and video cassettes.

  The relevance of these CCTV systems to our present concerns is that they represent not just a delivery system, but also a *production capability which could conceivably be interfaced with cable TV* headends.

- *Other Modes* - Finally to complete this video overview, passing mention must be given to a couple of highly localized forms of TV use. One is dial-access video, in which an individual student in a study carrel may dial up any given title from a remote bank of stored video tapes; *this still tends to be a rather exotic technology, expensive to* install, debug, and feed with courseware. It has caught on at only a handful of campuses.

  Another localized video tool is the portable videotape unit, or "porta-pak," which is now virtually ubiquitous. All the indications are that there are probably very few campuses which do *not* have a *portable unit around somewhere, if only locked in the AV director's* closet. They are particularly prevalent in education and physical *education* departments, where they are heavily used for "microteaching" and other forms of self-observation.

ITV RESEARCH FINDINGS

What have we learned from these 20 years of glowing cathode ray

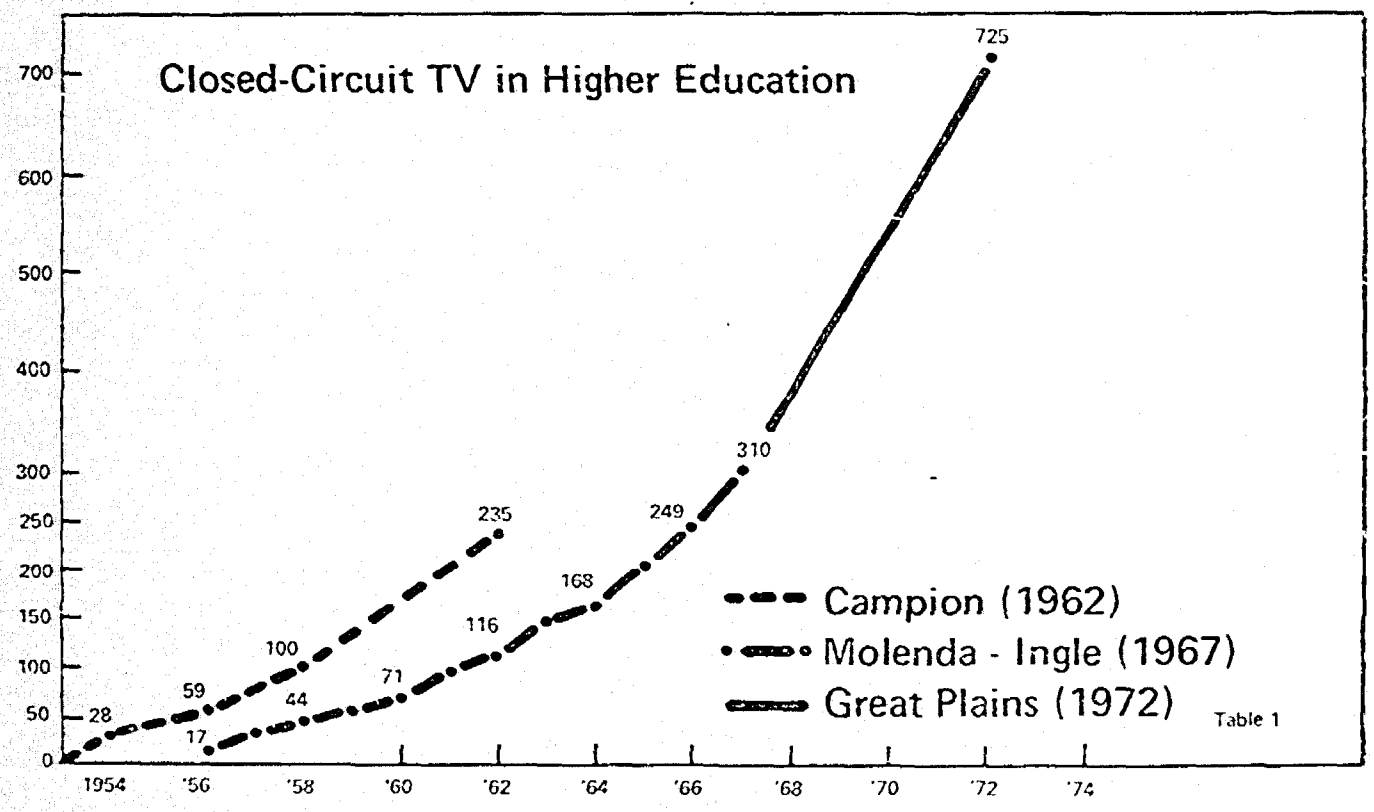
Closed-Circuit TV in Higher Education
700
600
500
400
300
250
200
150
100
50
0
1954
'56
'58
'60
'62
'64
'66
'68
'70
'72
'74
28
59
100
235
17
44
71
116
168
249
310
725
Campion (1962)
Molenda - Ingle (1967)
Great Plains (1972)
Table 1

Fig. 1

tubes? What do we know for sure? Unfortunately, not as much as we might, considering the hundreds of research studies that have been publicly reported. The problem, in the view of research methodologists, has been that the great preponderance of these have been comparison studies comparing the local version of "televised instruction" with the local version of "conventional instruction." In other words, it is asked whether can-of-worms A is better or worse than can-of-worms B. Each is so full of wriggling, slippery mysteries that no matter what the answer, it is nearly impossible to explain the significance of that answer, to use it to improve practice, or to generalize it to other situations.

Many researchers are, of course, cognizant of this problem and they have striven mightily to match the two treatments exactly on every controllable variable, changing only the means of transmission (TV vs. face-to-face). But when this is successfully done we find that both forms of instruction have been compelled to fight with both hands tied behind their backs, neither having been allowed to do what it can do best. The inevitable result: no significant difference. As Mielke's[7] recent critique so forcefully points out, this voluminous array of comparison studies has left us with little either for purposes of administrative decision making or in terms of scientific generalizations about how students learn from television.

Our overview of ITV research, then, is approached with considerable caution, because we don't know exactly how to interpret "no significant difference" or a finding favorable or adverse to televised instruction. Nevertheless, several major attempts have been made to collect and analyze the findings of studies related to on-campus televised instruction in higher education.

The first, a comprehensive survey by Godwin Chu and Wilbur Schramm,[1] reached this general conclusion:

> So far as we can tell from present evidence, television can be used efficiently to teach any subject matter where one-way communication will contribute to learning.

Within that general pattern, though, it appears that results have tended to favor television more frequently at the elementary-secondary level than in higher education (See Figure 2).

A more recent analysis, conducted by Robert Dubin and others[3] at the Center for Advanced Study of Educational Administration, reached a similar conclusion:

> In the most intensive analysis across many studies yet made, we can find no evidence to dispute the conclusion that one-way television is as good as other college instructional media.

It is important to emphasize Dubin's distinction between one-way and two-way uses of ITV. The results of these two treatments were analyzed

separately, for reasons which will become clearer as we proceed. First, Figure 3 indicates the slightly pro-TV trend they found among the *one-way* television comparison studies in higher education. But more startling, particularly in light of our great expectations for vast *improvements* stemming from cable TV's two-way transmission capacity, is Dubin's conclusion that face-to-face instruction is significantly superior to two-way television (See Figure 4). We see that out of 35 *independent* comparisons, 77% favored the face-to-face treatment.

How can this anomalous finding be accounted for? It really doesn't seem likely that being able to communicate with the TV teacher somehow *inhibits* learning. In most of the cases studied, feedback was enabled by placing a *microphone* in the remote classroom; one particular study of this type was conducted by Larimer and Sinclair[6] at Penn State. They found that interation among students was inhibited, *negative attitudes arose*, and lower grades were attained by the remotely located students. We can only speculate as to why these effects occurred: technical problems with the audio system that made it clumsy and unreliable to use, heightened expectations which could not be fulfilled, or possibly an instructional method which was simply not well adapted to receiving and using feedback. In the absence of definitive research results, we are left only with hypotheses. All we know for sure is that there is nothing magic about an ITV system that simply allows for audio feedback. Perhaps such a system can be turned to good advantage; we have not found the best way to do that yet.

CURRENT TRENDS IN RESEARCH

In recent years, there has been a decided drop-off in the use of the comparison method. The emphasis nowadays is on *formative*, or developmental, evaluation. This approach says, "We're not concerned with what TV is better than; we just want to find ways of improving its effectiveness here and now."

One example may suffice. Faye Dambrot[2] reported on a decade of developmental evaluation regarding a televised general psychology course at the University of Akron, a course which had enrolled some 20,000 students in that time span. Dambrot's modest claim at the end of her report is that "In a ten-year period, through trial and error learning, an efficient and effective course has emerged which is well received by students." This result was achieved by means of constant evaluation and modification semester by semester. For instance, the course was presented five times, with constant revision of content and methods, before it was videotaped the first time in 1967. According to her report, comprehensive cognitive testing and attitude measurement still continue, feeding in data for periodic revision. (By the way, for the benefit of administrators, it

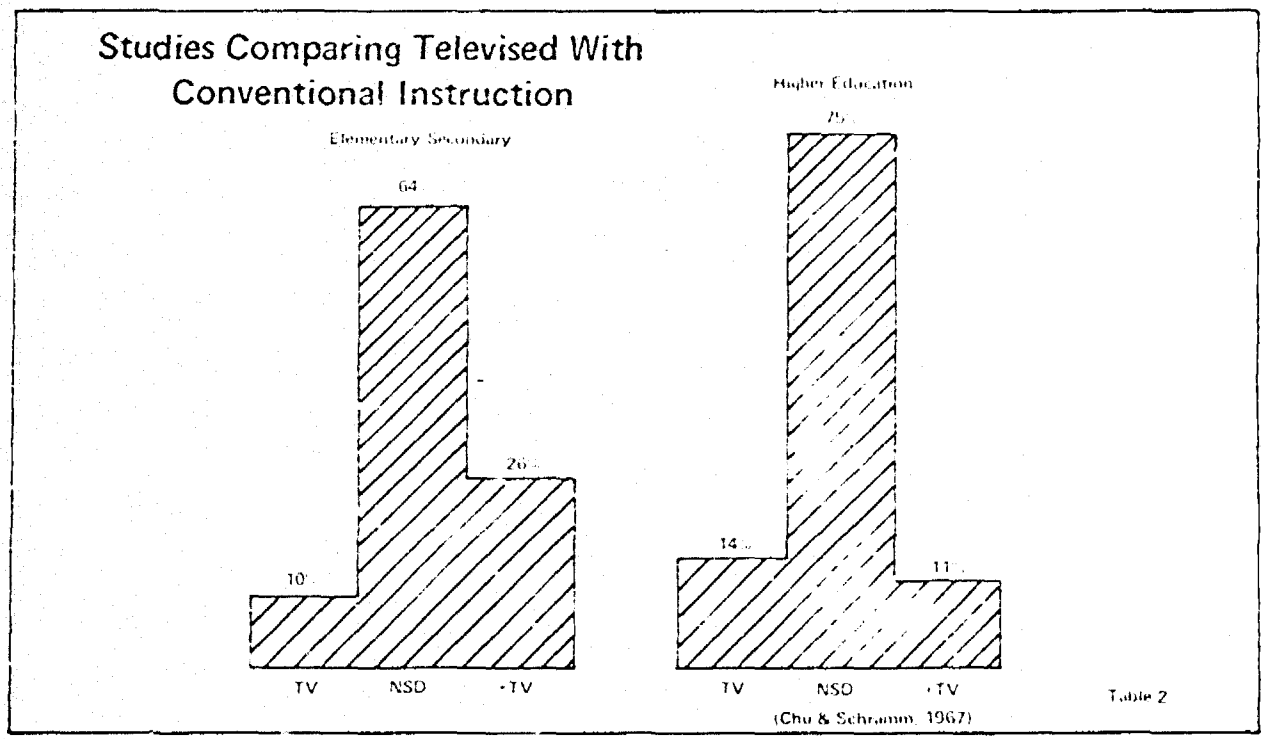
Studies Comparing Televised With Conventional Instruction
Elementary Secondary
64
26
10
TV
NSD
-TV
Higher Education
75
14
11
TV
NSD
-TV
Table 2
(Chu & Schramm, 1967)

Fig. 2

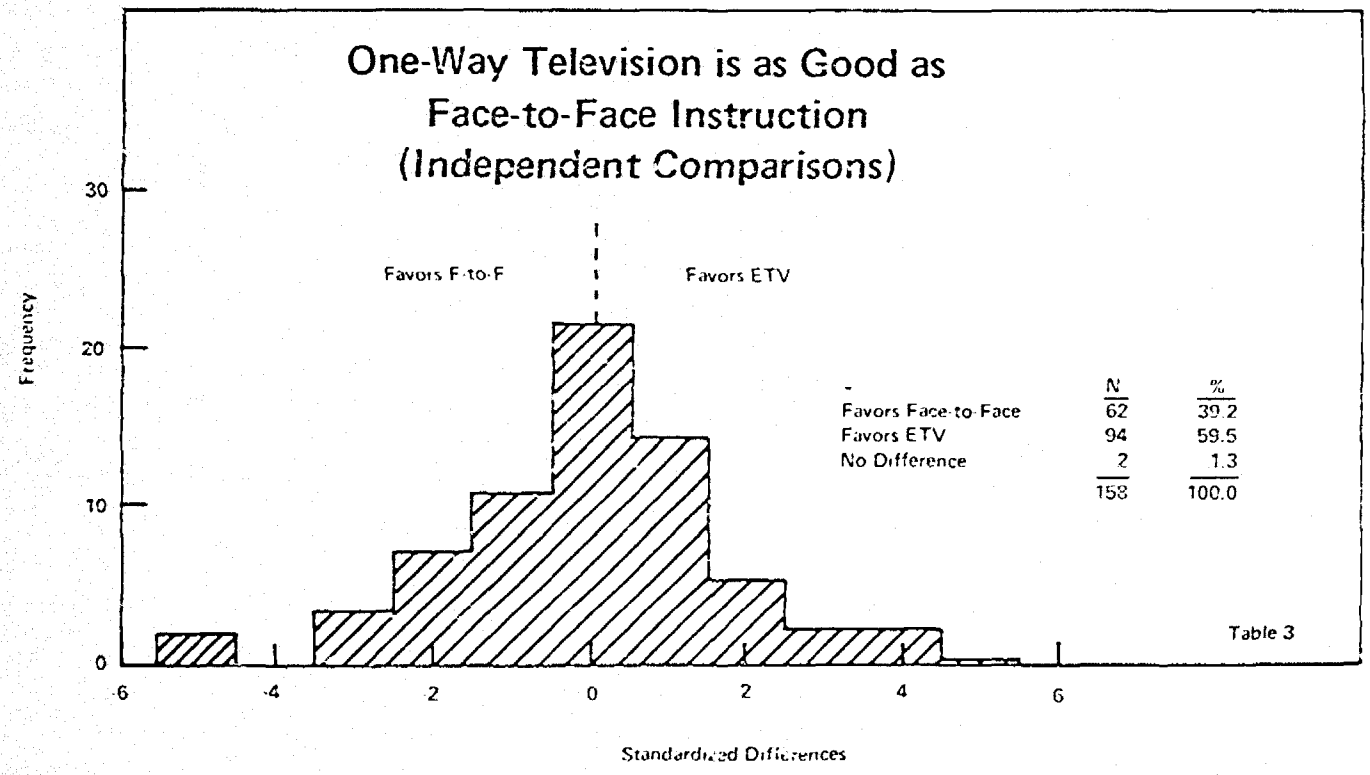
One-Way Television is as Good as
Face-to-Face Instruction
(Independent Comparisons)
Favors F-to-F
Favors ETV
Frequency
30
20
10
0
-6
-4
-2
0
2
4
6
Standardized Differences
N
%
Favors Face-to-Face 62 39.2
Favors ETV 94 59.5
No Difference 2 1.3
158 100.0
Table 3

Fig. 3

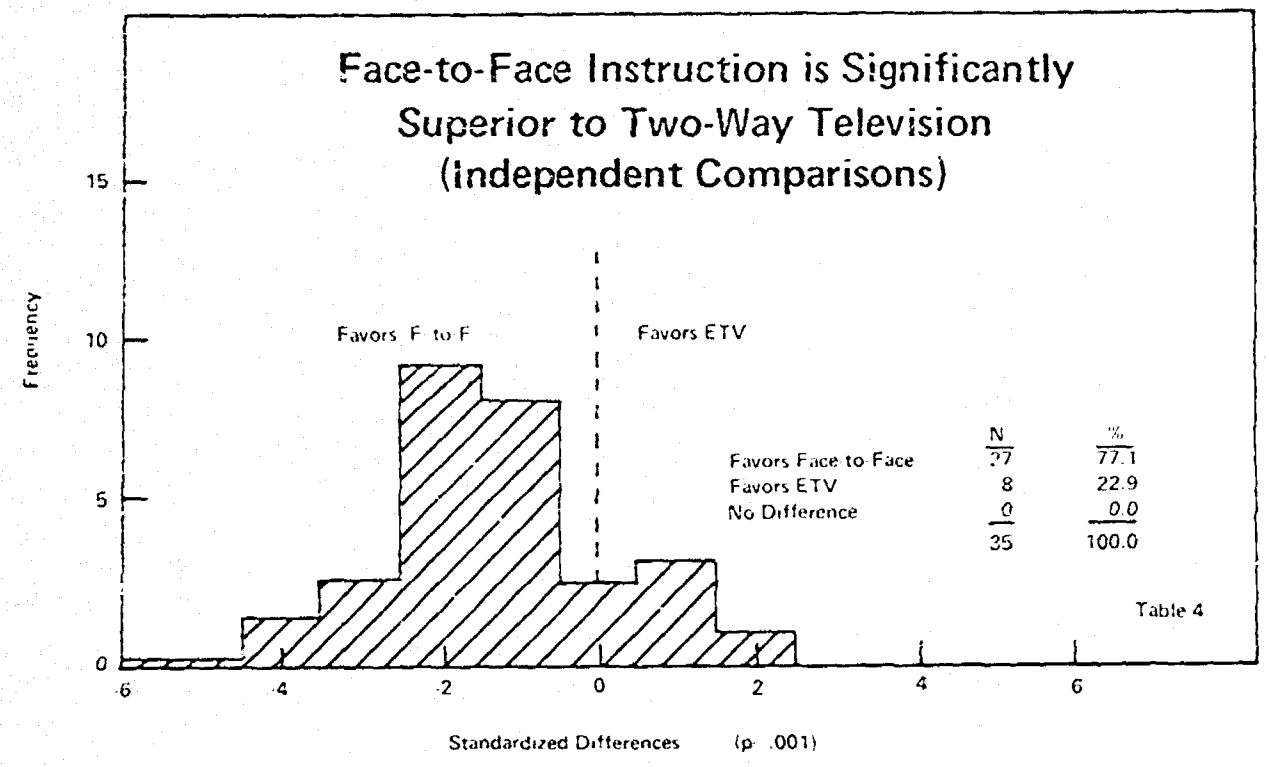
Face-to-Face Instruction is Significantly
Superior to Two-Way Television
(Independent Comparisons)
Frequency
15
10
5
0
Favors F to F
Favors ETV
-6
-4
-2
0
2
4
6
Standardized Differences (p .001)
N
%
Favors Face-to-Face 27 77.1
Favors ETV 8 22.9
No Difference 0 0.0
35 100.0
Table 4

Fig. 4

should be noted that some 3,700 students now take this course annually under the supervision of *one* faculty full-time-equivalent.)

THE OFF-CAMPUS AUDIENCE

Of greater interest to cable adherents, but the subject of vastly less research, is the off-campus home viewer of ITV offerings. The research evidence we have, again gleaned from the Chu and Schramm survey metioned earlier, indicates that at-home TV students do learn; in fact, they tend to perform better than thier on-campus counterparts and they frequently have a more favorable attitude toward learning via the tube. Chu and Schramm speculate that this may be a product of their generally higher overall level of motiviation. They are viewing because they want to, not because they have to.

More of the research on off-campus TV learners falls into the category of audience analysis – examination of the personal characteristics of the users of this service. Perhaps the most systematic long-term body of data on voluntary home use of ITV has been compiled by Chicago City College, which has operated an extensive broadcast ETV system for about 20 years. James Zigerell,[9] Dean of the TV College, reported several years ago on the characteristics of their typical home viewer:

- most likely a woman (75% of their students are)
- age, late 20s
- typically, a teacher (40% are now teaching or plan to)
- is highly motivated
- is enrolled for credit, and is vitally interested in attaining "credentials"

TYING IT ALL INTO CABLE TV

One of our ultimate concerns here is whether or not there is a confluence of interest between higher education and cable TV. Our experiences to date, although still in an embryonic stage, yield at least a tentative "yes." Indeed, a recent publication of the National Cable Television Association (NCTA) lists some 65 institutions of higher education which use their local commercial cable TV systems for the transmission of educational material. So the enterprise has already begun. The range of possibilities is obviously great. For an in-depth analysis of two rather different approaches, I recommend to your attention: *Cable Television and Higher Education: Two Contrasting Experiences* by Leland Johnson[5].

Cable undoubtedly offers higher education an outlet to a new learner, the off-campus, part-time student. But besides this difference in target audience, cable offers at least two technical capabilities which are unique

to cablecasting: (a) It can provide multiple channels for simultaneous communication with multiple small audiences; (b) it can allow two-way interaction between the teacher and the learner.

As is so frequently the case, if viewed from a slightly different point-of-view, these opportunities can also be seen as problems. First, the multiple-channel opportunity evokes educational TV's historical inability to produce sufficient quality software to fill the existing, limited channels. Part of the problem here lies in college educators' consistent reluctance to produce material jointly and, more especially, their resistance to using courseware produced outside their own campus.

Second, the opportunity for two-way interaction is clouded by the rather obvious failure to date to identify and perfect teaching methods which capitalize on this capability.

My message, I suppose, is that we educators had better get the horse out in front of the cart — to decide just what it is we want cable to do for our institutions. We have encountered the electronic media before. We've made mistakes. It is hoped that we'll learn this time around, the alternative being Anthony Oettinger's[8] woeful observation:

> Mindful of past fiascoes of educational radio and television, contemptuous of mass media, finding no significant difference, featherbedding, or oblivious, the schooling establishment so far has done little dreaming or thinking about CATV, leaving the field to others.

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