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AUTHOR Feiner, Albert
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ABSTRACT

The ATS-6 Educational Satellite Communications Demonstration-Alaska (ESCD), was viewed as a way to give isolated population groups greater voice in their educational future, by bypassing bureaucratic levels and allowing the local people to have a direct say in the school curriculum and programs that were shown via satellite. This study focused on the programs on the ATS-6 satellite and evaluated the effectiveness of the programs in terms of the objectives stated for the project. In addition, recommendations were made: (1) on the impact on organizations; (2) to the educational community; and (3) to social services experiment and demonstration managers. The issue of local control for each village or region was explored along with international policy implications. It was found that the educational objectives of both the federal and state agencies were continually in conflict with the practical objectives of establishing a basis for a communications network for Alaska. The results of the evaluation shed light not only on the strengths and weaknesses of using interactive telecommunications, but also on the relationship between sponsors and those responsible for demonstration/experimentation management. (HAB)

SOME POLICY ISSUES EMERGING FROM THE EDUCATIONAL SATELLITE COMMUNICATIONS DEMONSTRATION IN ALASKA*

A. Feiner
Practical Concepts Incorporated
Washington, D.C.

The ATS-6 Educational Satellite Communications Demonstration--Alaska (ESCD), was anticipated with great excitement from its inception. The sponsoring agencies of the Federal Government saw it as a way to give isolated population groups (communities) greater voice in their educational future--a means of intervention, which bypassed bureaucratic levels and allowed them to have a direct say in the curriculum and programs which influenced their future and that of their children. Interactive telecommunications (usually perceived as television) would allow them to choose those aspects of white culture necessary for and desirable to survive in a rapidly changing world accelerated by the Land Claims Act and the Alaska pipeline while retaining those aspects of native culture necessary to ensure survival of their culture and mores within the communities--especially the children.

The State of Alaska, while concerned about problems of how to provide local control to the native population, had a second--and to them--more important agenda. The State of Alaska, like many "developing countries," has minimal communications and transportation systems. In a sense they are more fortunate than their brothers in the "lower 48" in that there exists no communications establishment with huge investment in fixed plant to strangle the innovative use of new technologies

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required to provide services to all people of the state, and as quickly as possible. Recognizing that satellite communications presents an attractive alternative, the State of Alaska through the Governor's Office of Telecommunications (GOT) looked upon the ATS-6 experimentation as a way to gain technical experience in the installation and operation of a satellite system from which to plan future statewide satellite communication systems.

The educational objectives of both the Federal and State agencies were continually in conflict with the very practical objectives of establishing a basis for a communications system for Alaska. The result of our evaluation, therefore, shed light not only on the strengths and weaknesses of using interactive telecommunications, but also on the relationship between sponsors and those responsible for demonstration/experimentation management.

1. THE ESCD-ALASKA DEMONSTRATION

The main target groups for the education demonstration were primarily school children between the ages of 5-10 years, village adults and village teachers.

The youngest group, 5-7 year olds, were exposed once a week to a series of videotape presentations aimed at improving their oral language skills (English). The format used was that of an English-speaking Alaskan woman who finds a space ship containing two astro children and a robot (puppets) and she attempts to teach the astro children English. After each video presentation the 5-7 year olds in the participating classrooms (dispersed throughout the ATS-6 coverage) were able to ask questions of a teacher located in the central studio at the broadcast site. The interactive portion lasted 10-15 minutes. A total of 32 programs were broadcast.

A health series called "Right On" was the fare for 8-10 year olds. Each program targeted a specific health problem. The format used paralleled that of the Basic Oral Language broadcasts in that the central character was a woman (village health aide in this instance) giving advice and assistance to a moose and a beaver (puppets); a germ puppet was the villian of the series. In addition to these newly produced shows, an "off-the-shelf" program was also transmitted each week for a total of 64 programs. Interaction at the end of the "Right On" transmissions between students and a health professional at the central studio also lasted 10-15 minutes.

Perhaps the most ambitious undertaking was the series called "The Alaska Native Magazine." This consisted of weekly 60 minute public affairs programs devoted to news and events that would impact Alaskan Native community life. Each program was viewer-defined. It was hoped that in this way the programs would attract the largest audiences. Interviews were conducted at the central studio and combined with on-location film footage to produce a combination documentary/round table discussion/interview format. Occasionally events of national interest were also included; e.g., the inaugurations of President Ford and Governor Hammond. Interaction between local community adult groups and the moderator and his guests at the central studio was conducted for the last 20-30 minutes of each broadcast. A total of 32 programs were broadcast during the demonstration period. The format is reminiscent of the Rural Radio Forums of the developing countries with the addition of video (instead of audio only) and the instant feedback provided by interactive telecommunications.

The teacher training series consisted of weekly lectures on topics dealing with "Motivating Children to Learn" and a number of round table discussions in which village teachers participated via satellite. A total of 28 programs were broadcast.

A special feature of this demonstration, aside from the live interaction, was the use for the "Alaska Native Magazine" programs of the multiple-audio channels (4) available on ATS-6 to transmit Koyukan and Yupik along with English. In addition, Consumer Committees made up of residents of the participating villages were involved in planning the content of both the children's and adult programs. They were involved in the design of the broadcasts, defining the content objectives, methods of presentation and viewed finished products, where possible, to ensure final products lived up to Committee expectations. Utilization Aides were hired in each village to publicize program schedules, gather impact data, ensure equipment worked properly and in some instances acted as moderators for the adult participation programs.

2. NATIONAL EVALUATION FOCUS & ROLE IN FUTURE DEMONSTRATIONS/ EXPERIMENTS

The evaluation perspective of Federal Agencies or other sponsors should not be distorted by the users to be solely coincident with the objectives of the organizations and groups performing the demonstrations and experiments. Whereas users are concerned, and rightly so, with educational quality, individual learning, or how to make for more efficient operation, the Federal dollar can more profitably be spent by creating change and promoting innovation to learn about the mechanisms that produce educational benefits. Much of the improved effectiveness in education, as in most social and private endeavors, can be realized by improved relationships at all levels of supervision, and by improved administrative and supervisory functions and procedures--in other words, by proper management of people and resources. Therefore, the way individuals and organizations interrelate at the outset and throughout the progress of the demonstration is of particular importance at the national level. The focus of our study, therefore, was on what organizational and institutional relationships were

instituted at all levels from the village on up; on procedural matters which had to be implemented to accommodate to the new situations; and how the relationships and procedures evolved as more was learned about the capabilities and limitations of the technologically induced innovations.

Following this logic, NIE's role in future satellite programs should be to provide the tools (in this instance satellite time and satellite-related equipment) which permit the individuals and organizations who perceive the problems to innovatively apply the technology to the solution of their own problems; to provide the means to shorten the time between research and unsubsidized operation and/or to determine if the new technology is sufficiently valued by the user communities to warrant subsidy on an operational basis; to identify dysfunctional aspects of the technology; and to explore various funding mechanisms to determine which provides maximum useful information and permits the greatest degree of freedom for users to introduce innovation.

3. FINDINGS AND RECOMMENDATIONS

Because of the dual purposes for ESCD-Alaska as perceived by NIE and the State of Alaska (noted in the introductory paragraphs of this paper), the impact on participating organizations cannot be catalogued solely as to their impact on the educational system but rather some of the impact was at the State level quite independent of education. In fact, some of the more important impact had nothing whatsoever to do with education.

a. Impact on Organizations

1. ESCD contributed to Alaska's ability to "stand up" to RCA Alascom/Globecom and negotiate for a suitable commercial telecommunications system for the State.

This was perhaps the most important aspect of the demonstration as far as the State of Alaska was concerned and certainly is the case in terms of near-term impact. Newspaper articles, correspondence between the GOT and RCA and FCC, legislative and other interviews show that the ESCD-Alaska contributed substantially to the following effects:

- Influential people and organizations (e.g., newspaper) made aware of the range of capabilities of the technology to support education and health.
- People made aware of the benefits that could be realized with inexpensive, easy-to-maintain equipment.
- Alaska Office of Telecommunications (GOT) gains hands-on experience with the technology as well as practical experience in the installation and maintenance of the hardware.
- Data that showed that small, inexpensive earth stations could do the communications job and permitted GOT to successfully contest RCA's expensive system to the satisfaction of the FCC.
- The State of Alaska negotiations with RCA Alascom culminated in the installation of small earth stations in village Alaska.

2. ESCD contributed, perhaps substantially, to the direction and rate of growth of the GOT.

Correspondence between Governor Eagan of Alaska and Dr. Fletcher of NASA in 1971 marked the beginning of an organized effort by the Governor's office to assume control of experimental satellite communications efforts which would effect the future course of communications planning and implementation in the State. As plans firmed up for the use of ATS-6, the GOT assumed a larger and more important role in the communications planning. It is doubtful that GOT would have evolved in the fashion it did, or have the experimental base it now possesses and which is its strength in communications affairs. Specifically, the correspondence

files of GOT, NIE, NASA and others shows that ESCD contributed substantially to:

- The designation of the first person (Arnold of AEBC) responsible for experimental design and programming.
- Placing satellite experiments under the control of the GOT.
- Designation of an individual in GOT as satellite experiments coordinator.
- Encouraging GOT to become involved with Communication Technology Satellite and expanding its functions to include the means to bring as many agencies (Alaskan) as possible into the program.
- Providing impetus for the GOT to become involved in program production to meet village educational needs.
- Providing the experience necessary to enable GOT to procure satellite earth stations for its own telecommunications systems.

3. ESCD was the precipitating agent allowing Alaska to become involved in the production of programs specifically for its rural population.

All educational experimenters on ATS-6 found it necessary to a more or less extent to develop new programming. In the Alaska instance this was mainly due to the desire on the part of the State and Consumer Committees to tailor the presentation to the particular audience being addressed. The most justifiable was programming generated for the Alaska Native Magazine which was a series of public affairs programs requiring the use of current material of interest or concern to the adult population and therefore had to be timely.

Words of caution are required at this juncture. It is not clear that tailoring programs for small populations can ever be economically justified and if highly desired may require a continuing subsidy by either the State or Federal Government. Continuation of such

programming must be a conscious decision on the part of the sponsor. Should the financial aspect be unfavorable, further experiments and demonstrations should not begin. The following aspect of centralized programming should be kept in mind. In an effort to be of interest to a large enough population to make programming economically viable it may have to appeal to a number of cultural groups. Programming of this variety may have to be a compromise, the compromise may present an erroneous conception of native life as seen through the eyes of the producers in the central studio. Such programming is worthless to everyone.

4. Alaska becomes a member of the Public Service Satellite Consortium (PSSC) dedicated to the use of satellites for social service delivery.

Recognizing that the Federal Government will probably not sponsor operational social service delivery, Alaska has joined with other deliverers in an attempt to aggregate a market large enough to influence the future course of commercial satellite communication development and to capitalize on economies of scale which could result therefrom.

5. Alaska is convinced of the value of educational satellite experimentation and is willing to assume progressively larger share of costs.

Correspondence between GOT and NIE states that Alaska is willing to assume a larger share of experimental costs each year up to a limit of $1,000,000.

b. Recommendations to the Educational Community

Although the ESCD-Alaska only included some 15 native villages, a number of findings were found to be significant enough to be recommended as guidelines for all future satellite-supported educational services delivery experiments. Many are not new, but further reinforce what has been found in other experiments throughout the world. A significant lesson has yet to be learned by experimenters and sponsors alike--survey the literature; many pitfalls can be avoided by learning from the mistakes of others! And I might add, a lot of money saved.

1. Planning for telecommunications-supported service delivery should include the means for transitioning to operational status of those aspects deemed successful.

Raising expectations of the target populations, especially where health or education is concerned, and then not following through, creates resentment. Experience shows that some resentment is generated if the same population is used in several experiments, even when not successful or when amply warned that it is an experiment. The feelings aroused create resistance to further efforts and could lead to failure or even prevent installation of worthwhile programs.

2. Satellite delivered television is not justifiable on the basis of real-time viewing or live interaction.

This was found to be true in dealing with youngsters in the primary schools as well as with the adults in non-formal education demonstrations. Restrictions imposed on classrooms of children by requiring a single student at a time to speak; the probability that questions asked will only be of interest to a few of the students in a particular classroom; requiring them to sit around and wait their turn or to quietly

occupy themselves while single individuals converse imposes a discipline few can accept. The result is usually loss of interest and restlessness. Further, requiring that the classes relate to a particular subject at a specific predetermined time regardless of how and where that subject falls in the class' curriculum has created problems. Proper preparation of the class and insertion of the materials when the individual teachers determine the time is right was considered by most to provide a more worthwhile experience for the students. Recording materials for use at teacher discretion at any time was considered the best use for satellite delivered television programming.

Adults in the small rural communities were reluctant to ask questions knowing that many people could be listening. It is difficult to get participation from people in a group in a single community let alone from a number of communities when they cannot see the others. At least a trained moderator at each site would be required to stimulate such discussions. This experience is not unique to Alaska and has a parallel in the Rural Radio Forums of the developing countries.

3. Materials distribution may be the only potentially cost-effective use of the satellite-delivered television.

Experience with children, teachers, and adults has demonstrated a high acceptance of satellite-delivered programming, especially on a demand-need basis. Live television interaction is expensive and does not appear to offer any learning advantage over audio interaction, even between professionals. Analysis shows that where a large number of users require, or can use, the same material, regardless of when in the curriculum it is used, that the mass distribution capability of the satellite can be cost-effective. Thus transmission and storage of programming for use at the discretion of the users appears to be the only viable mode of operation for satellite-delivered television for sometime to come.

4. Local control over programming can only be achieved by giving local organizations purchasing power and the right to buy or reject materials.

The Consumer Committees in Alaska only exercised token control over programming. They were, in the main, advisory groups. Although they had a say in the subject matter and manner of presentation, it was not until the product was "in the can" that they were able to see whether it was what they wanted--in many instances it was not but it was too late at that point. Humor, local cultural touches and speech patterns were some of the areas where programming failed to be what was expected. Further, it is expecting too much for individuals untrained in content development to provide the kind of guidance needed to produce the desired product. Therefore, giving them funds and the ability to view and choose between competing products, appears to be the best way to achieve most satisfactory results.

5. Regional media networks appear to be the only way to satisfy region-specific program needs.

Our evaluation showed that the demand for region-specific programming stemmed from a number of expressed needs and concerns: concern about how much television is good for rural communities; interest in regional topics and issues; desire for some Native language programming; regionalization of the school systems and the desire to retain the cultural and moral tenets of the groups involved. As a minimum it appears that the products of such Regional Producers are needed in conjunction with centrally and commercially-produced materials. Further, "culturally relevant" programming will require the training of Alaskan Native Media professionals in order to capture the subtleties of the Native cultures social and behavorial characteristics.

6. Public service adult participation program schedules must fit with the social patterns of the communities.

Both large and small attendance at broadcasts was greatly influenced by what other established social functions were occurring at the same time. In those instances where the programs conflicted with other community affairs, only a few people attended. In certain instances where the programs were added to normal social functions, attendance was high and some participation achieved. In the main, programs were shown in the schools where the adult population rarely goes and feels uncomfortable. This also contributed to small attendance. In some communities the population deferred to the school teachers and so interaction was dominated by them. In one village, the selected language channel chosen was English because the teacher did not understand the native language. It was found that once an audience is lost, it is very difficult to win them back.

Participation by the native population and suppression of dominant individuals (e.g., some teachers) requires that a Native moderator trained in group interaction techniques be present in the future. This could contribute substantially to increased attendance if not participation. Again, there is a parallel in the developing world use of Rural Forums.

c. Recommendations to Social Services Experiment and Demonstration Managers

The ESCD implementation was marred by problems that could have been avoided by following basic rules of planning and management:

1. Detailed and complete project plans must be developed by the Demonstrators/Experimentors and concurred in by the Sponsor's Responsible Officer prior to fund commitment.
2. Fund commitment covering the entire approved project must be made at the outset.

3. There should be a single agent at the sponsor level responsible for funding.

4. For each project there must be a single responsible individual or organization to whom problems can be addressed.

Documents, mainly correspondence, in the files of the experimentors and several federal agencies shows that the result of neglecting to follow the four basic rules above resulted in numerous delays, generation of frustration and friction and poor programming. Specifically the documentation verifies the following dysfunctional effects:

- Planning proposals for initial year's funding (FY '74) were submitted periodically from 3/72 through 8/73 (educational experiments) due to changing organizational responsibility at the Federal level.
- Project responsibility changed organizational hands three times at the Federal level (to say nothing about people).
- Funds, other than for planning grants, were not released until December 1973, just 5 months before the launch of ATS-F.
- Three agencies were funding Alaska at the same time--HEW/OT, USOE and/or NIE and Corporation for Public Broadcasting.
- Congressional battles with the White House over the HEW budget made it impossible at one point to guarantee payment to Alaska for programming services.
- Final funding was uncertain until mid-February 1975, 4 months before the end of the project.
- Program production funds were not made available until March 1974, two months before satellite launch.
- In the early days of the program, two organizations in Alaska simultaneously sought funds from HEW for ATS-F educational technology planning.
- In early 1973 the Federal sponsor was forced to intervene in the Alaskan project management to force the Governor's Office to appoint a single individual responsible for the Alaska demonstration.

5. The responsibilities of lay Consumer Committees must be compatible with their knowledge and training.

It was generally conceded that Consumer Committees were worthwhile and effective. However, their "charter" from the outset was all-inclusive and did not recognize the restrictions which their limited backgrounds would impose on their ability to adequately judge certain aspects of program content development. In general, there was agreement that the Committees functioned adequately in the following areas:

- Determining goals and priorities.
- Characteristics to be used.
- Final program design.
- Lesson sequencing.
- Series titles.
- Choice of appropriate "canned" materials.
- Best presentation times for various audiences.
- Selecting the settings for the programs.
- Judging the appropriateness of language used in the content developed (e.g., use of bureaucratic language).
- Judging on the acceptability of the method of presentation (e.g., "slickness").
- Selection of topics for public service broadcasts.
- The pace of the program.

The areas where experts expressed concern regarding Committee effectiveness were:

- Program outlines.
- Choice of puppets and other means for getting the messages across effectively.
- Lack of awareness of the cost of implementing some of the desired features.
- Number of characters which can be effectively used in a single program.

6. Responsibilities of site review teams should be complementary to those of other organizations and where there is overlap, it should be made known to all participants.

A site review team visit was responsible for forcing implementation of formal Consumer Committees although they were used on an ad hoc basis previously. It is ironic, however, that a second site team countermanded certain recommendations of one of the Consumer Committees in the area of program development--the reason for their being. The following recommendations are a result of a thorough study of the documentation:

- Members of the site team should be briefed on all experiment objectives (in this instance that telecommunications needs other than education were involved).
- Team charter should be made known to those being visited as well as the site team well in advance of the first visit.
- Desired decision elements and the limitations which constrain these decisions should be defined (e.g., delaying funds when time is critical to the entire project is not an acceptable recommendation).
- Recommendations of the site team should be disseminated to all concerned parties as quickly as possible.

4. THE RECURRING ISSUE OF LOCAL CONTROL

Major innovations of the ESCD-Alaska demonstration were the use of Consumer Committees and satellite communications to give a greater degree of control over the education system to the Alaskan Natives. Many of the findings and recommendations of the prior section dealt with how to give local groups greater control over programming (e.g., pruchasing authority for some materials) and the need for regional producers to meet cultural and moral needs of the different native groups. However, the data, although indicating "limited" steps which

can be taken, does not offer a solution to the problem. The reason being that the question is much more complex than was perceived by those who formulated the demonstration and now that we have more data some of the previously unknown factors and their potential impact have come to light. I am convinced that we just now begin to see the tip of the proverbial iceberg. Consider, for example, the following questions raised by the findings and recommendations of this evaluation (Alaska-specific):

- If each village Consumer Committee or other designated group has control for its village over content purchased will economies of scale ever be realized?
- Is consolidation of needs across a "region" (yet to be defined) necessary to define a "package of materials" for a sufficiently large market to attract producers?
- Consolidation implies yet another organization superior to the individual village groups.
- What overall structure is required to integrate these factors and tie them into a realistic school management scheme?
- How do the above statements impact the concept of regional media producers and managers? Can they effectively respond to individual village group needs or is state subsidization necessary? Does the concept of local control permit viability of private regional media producers?

This is a very important issue in Alaska at this time because many new school districts will become operational as of this July. It is an area which should not be ignored in future experiments or demonstrations. Telecommunications has much to offer. Its use for supervision and administrative matters as well as in direct support of education has been proven in demonstrations and operational systems throughout the world.

5. INTERNATIONAL POLICY IMPLICATIONS

The U.S. foreign assistance program must comply with two mandates that often appear mutually exclusive:

- To benefit the poorest segments of society, particularly and most frequently the rural poor.
- To adopt a low profile for foreign assistance--avoiding charges of meddling in the affairs of the client-state(s) and exporting of U.S. cultural values.

One way to reconcile these objectives is to reduce the effective costs of providing social services to the rural poor without prescribing the nature of those services. Thus the popularity of road construction projects. A road lowers the cost of access to the rural poor and a flow of benefits should result from natural economic processes. Unfortunately, those projects that support the most rapid economic growth usually support already productive areas of the economy, and thus emphasize value-added to already prosperous enterprises. The distribution of benefits to the rural poor is at best a "trickle down" effect and the results are discouraging. A Stanford study showed that in many countries the poor are relatively and absolutely worse off than they were 10 and 20 years ago.* Satellites, in many instances, can provide a practical alternative which would substantially reduce the cost of providing social services to the rural poor without intervening in the nature of the social services or requiring dramatic changes in the patterns of urban/rural investments. Further, satellite telecommunications ensures that the rural poor are direct beneficiaries of those services. A single satellite can provide social services access to a consortium of ten, twenty or more developing countries in Latin America, Africa, Asia, or the Middle East, for example. The U.S. investment per country per year in such a consortium of nations

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* Adelman, I., and Morris, C.T. Economic Growth and Social Equity in Developing Countries. Stanford University Press. p. 183, 1973.

would be substantially less than the majority of large projects presently sponsored and would capitalize on technology where the United States is the undisputed leader. The cost per user of a shared "consortium" satellite using relatively inexpensive terminals (as pioneered by NIE and others) could be attractive.

There is presently a high degree of interest by developing nations in satellite communications because of its recognized importance to national development, and there is great value in their being able to experiment with this medium to determine how it can best be used to meet their specific needs. Considering that Domestic Satellites are now well established in this country and that CTS will be available for further experimentation through 1980, the United States should weigh the merits of dedicating ATS-6 for third world applications. Such experimentation would be desirable as a mechanism for testing the cost and value to potential participating countries prior to a major U.S. investment.