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ABSTRACT

To implement a career education program for junior high school students in the rural, isolated areas of the Rocky Mountain States, Satellite Technology Demonstration (STD) tested the use of a satellite-assisted communications system for the delivery of social services. A magazine was designed to promote acceptance of the television programing and actively involve the students. A correlated teacher's guide was designed to supplement the STD's educational programing. The magazine and teacher's guide were both pretested in the field and at various sites. Approximately 50 percent of the students at the STD sites rated the magazine good to excellent. Teachers rated the guide as having an average message effectiveness. A flow chart illustrates the designing and writing of supplementary materials. (Author/DS)

SATELLITE TECHNOLOGY DEMONSTRATION

FEDERATION OF ROCKY MOUNTAIN STATES, INC.

technical report

TR0508

DEVELOPING PRINTED SUPPLEMENTARY MATERIALS TO ACCOMPANY SATELLITE PROGRAMMING FOR JUNIOR HIGH SCHOOL STUDENTS

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INTRODUCTION

The primary objective of the Satellite Technology Demonstration (STD) was to test the feasibility of using a satellite assisted communications system for the delivery of social services to rural isolated locations. These services were to be based on the needs of potential users. One of these needs was for career education programming for junior high school students. The STD programs for junior high school students (J-Series) had to be of high quality and well accepted by the users if the results of the technology application were to be fairly evaluated. This report is concerned with the development of support materials for the J-Series programs. User recommendations and staff consensus resulted in the development of a "TV Guide" (magazine format) for students and a correlating teacher's guide. The specific objectives of the guides were: (1) to encourage user acceptance of and (2) to supplement the career education J-Series called "Time Out!"

REVIEW OF MATERIALS

A variety of print media materials were surveyed for potential applicability and adaptability, including examples of designs from curriculum packages, television series, and film presentations. Materials from career projects, textbooks, and associated workbooks with career exploration and/or decision-making objectives were reviewed, as were learning kits, simulations, and games.

In-depth discussions were held with representatives from Science Research Associates, Inc., the College Entrance Examination Board, and the Far West Regional Laboratory. The National Instructional Television Center provided examples of several teacher and student guides associated with their programming. Mulligan Stew, a student magazine supplementing a 4-H television production in association with Michigan State University's Cooperative Extension Service, utilized a comic-book format. Student activities and teacher's guides provided by commercial film companies, particularly the Encyclopedia Britannica Educational Corporation, were also examined. Other materials surveyed included student newspapers, popular teenage magazines, guides for commercial television programs, crossword puzzle magazines,

and Resources for Youth, a newsletter published by the National Commission on Resources for Youth. While the review of materials provided examples of types of activities later developed, no one source was used as a prototype for the supplementary materials.

DEVELOPMENTAL PROCEDURES

Student Magazine

The objectives of the student magazine were: (1) to promote student acceptance of the programming; (2) to engage students in activities associated with the educational objectives of the project; (3) to provide students with personalized identification with the project; and (4) to serve as a possible source of classroom activity if technical problems prevented program reception.

To meet these objectives, a publication similar to TV Guide was proposed. Specifically, the magazine would contain program logs for each broadcast day and activities such as rebus, word-search, crossword, and "hidden objects" puzzles; decision-making and career games; articles and photographic essays. The first drafts of the student magazine were developed in spring, 1973, and distributed to state career development specialists and the STD staff for reactions and suggestions. This process determined that the main thrust of the student magazine was to provide an entertaining, personal link for each participating student. Input cautioned against material that would alienate either poor readers or rapid achievers.

In order to provide some localization of the materials, several site school administrators were asked to provide short illustrated articles on students in their schools who had been engaged in career-related activities. Several articles of this type were published in the student magazine. Furthermore, the decision-making aspects of the student magazine were affected by an agreement between the Demonstration and the College Entrance Examination Board finalized in November, 1973. Dr. H. B. Gelatt of the C.E.E.B. became a consultant to the Program Component. Although some decision-making activities were taken directly from C.E.E.B. materials, many were generated by the staff and reviewed for consistency by Dr. Gelatt.

Teacher's Guide

The primary objective of the teacher's guide was to supplement the STD's educational programming for junior high school students. Secondary objectives included (1) suggesting ways that community resources could be utilized in career exploration; (2) providing activities and discussion ideas for teachers, each of whom had a different subject area and teaching situation; and (3) serving as a source of ideas for classroom activities if technical problems prevented program reception.

The first drafts of the teacher's guide were developed in the spring of 1973. The first issue was to be an introductory section to be followed by bi-weekly updates. Suggestions for the introductory issue included: explanation of the Federation of Rocky Mountain States; description of the STD; instructions on the use of equipment; STD career development philosophy; map of the region; directory of participants; letters from site instructors; film and resource directory; a creative teaching award contest; program evaluation slips; directory of Denver personnel; and a profile featuring an STD teacher. This prototype was distributed to field and staff personnel.

Input from the state career development specialists and the staff resulted in several changes. The teacher's guide would not include operational instructions for equipment as Broadcast & Engineering was preparing a document for that purpose, the Broadcast & Engineering Training Manual for Health Education Telecommunications Network Site Operators. The explanation of East and West footprints and the directory of participants were eliminated; the map of participants could illustrate this information. Because of time constraints in printing, letters from sites would not be printed. The concept of a Creative Teaching Award and a resulting teacher profile was discarded when it became clear that the process of selection could be either too time consuming or too discriminatory. Since program evaluation would be designed and operated by the Research Component, program evaluation slips would be duplicative. The directory of personnel was eliminated as redundant, as the Utilization Component would send site requests and comments to appropriate staff members.

The first examples of the bi-weekly updates for the teacher's guide proposed the following contents: program logs; educational objectives and explanations thereof; pre- and post-

broadcast activities (originally called motivational and follow-up activities) and vocabulary words. This format was also circulated for reactions and suggestions.

Continuing field input emphasized the differences between sites. As it became more apparent that the sites would differ greatly in terms of teachers, students, available resources, and broadcast/class time, the layout of the teacher's guide began to change. Because every class would not have the same time before and after a broadcast, the pre- and post-broadcast activity titles were discarded. Teacher's guide activities would contain sections divided instead into "Things to Talk About" and "Things to Do," thus enabling teachers to choose questions and activities which suited them, their students, and their particular situations. Because the guide was supplementary, questions would promote discussion rather than demand correct answers. The questions and activities were not designed as homework or as evaluation devices; the teachers were to be assisted, not directed.

"Things to Talk About," the open-ended discussion questions, were designed to elicit affective and upper-level cognitive domain responses. The "Things to Do" section each day included a paper and pencil activity, a small or large group activity, and an activity that emphasized creativity. The activities were designed to localize the materials by utilizing community resources. Since closed sites would have only one reference material in common, the Index of Occupational Profiles (Johnson, William Julius. Mesa, Arizona: Johnson Publishing Company, 1973), some activities were based on this resource.

Vocabulary words were labeled "Key Words" and were selected on the basis of their importance to the major objective(s) of the program. Names of tools or words used during program conversation were not selected, but words that were fundamental to understanding the Dictionary of Occupational Titles and the Decision-Making Process were chosen.

In short, the teacher's guide became ( ) more flexible in response to the variety of users and their situations, and (2) more concise in response to sensitivity to cost and to the philosophy of supplementing rather than dictating.

PRODUCTION METHODS

The process of supplementary material design proceeded concurrently with the investigation of costs of various production modes. Design considerations must affect the choice of production method while, at the same time, the costs and flexibility of the alternate production methods also affect design conclusions.

Photo-copier and photo-multilith reproduction were considered because of in-house availability. However, these methods could neither adequately reproduce photographs or complex art nor produce multicolor printing. Further, unit cost at the volume of copies to be printed was too high to justify such mediocre quality.

Conventional out-of-house offset printing proved to be the most effective method for producing the student guide. At a unit cost actually below that of in-house methods, much higher quality was possible including the use of two colors and various screens of the colors, complex artwork, and photographs. Costs for the student magazine were $.285 per copy per issue or $1.14 per student per semester.

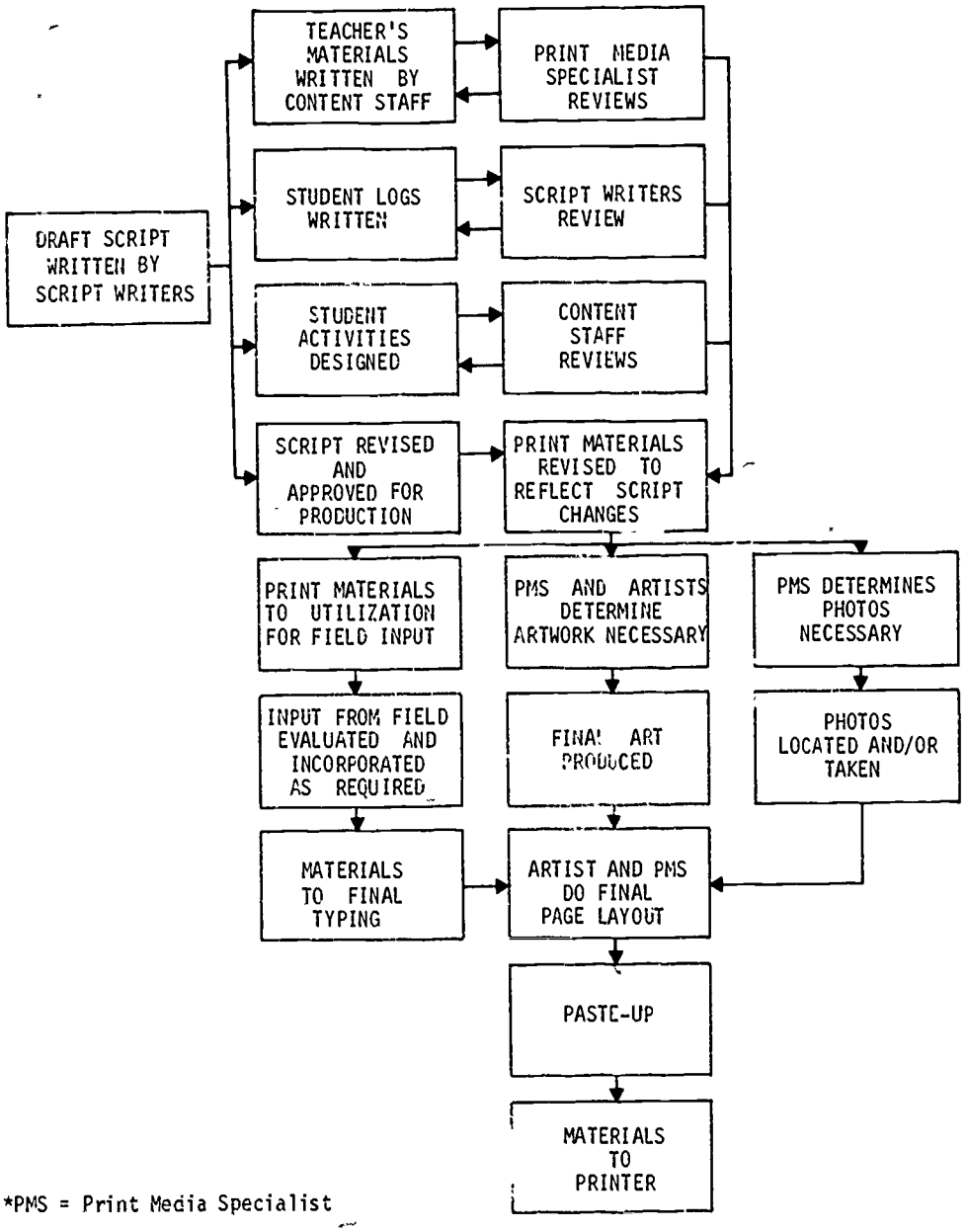
Because of the much smaller volume of printing involved (350 copies per issue vs. 4000 for the student magazine), a small offset printer or "rapid copy" house was the most cost-effective means for producing the teacher's guide. Because of smaller, less sophisticated presses and cameras, rapid copy printing quality is generally below that of conventional offset houses. Nevertheless, it met the more limited design requirements of the teacher's guide, while permitting the use of photographs at an approximate 50% reduction in costs over a conventional offset printer. Costs for the teacher's guide were $5.20 per teacher per semester.

OPERATIONAL PROCEDURES

Flow Chart

Once the basic formats of the student magazine and teacher's guide were finalized, work on the actual products began. The procedures were closely tied to the production of each program's script. The flow chart on the following page illustrates the actual process for

FLOW CHART



*PMS = Print Media Specialist

designing and writing the supplementary materials.

Field Examination

After review by staff personnel, rough drafts of proposed student magazine and teacher's guide materials were circulated in the field. With the assistance of the Research Component, a number of junior high school students in Adams County, Colorado, were given samples of puzzles, articles, and games to review. Their remarks were helpful in determining levels of sophistication and areas of interest in student magazine activities. Further student input was obtained during field visits by the print media specialist, content generalists, and script writers in December, 1973. Students in Idaho, Nevada, and Arizona were asked to complete puzzles and read articles, discussing their reactions with the STD personnel. This direct contact further emphasized the desirability of including activities and photographic essays rather than lengthy reading passages.

A draft of the introductory section of the teacher's guide was sent to the state coordinators and site personnel in April, 1974, for examination and input. This process resulted in acceptance of the drafts with minor editing corrections.

PRODUCTION PROCEDURES

As the design and the content were finalized by the STD, the printing process could begin. The printers required a full month to produce each issue of the student magazine and teacher's guide. Packing and shipping took an additional three to four weeks. As a result, final pasteup, which took another three weeks, had to begin at least ten weeks before the materials were needed by the users.

Additionally, scripts were occasionally changed during production. The program logs in the printed materials were based on "Approved for Production" scripts and could not reflect significant changes made in production.

After the first thirty scripts, a further problem was lack of time for field review. Therefore, the input on the printed materials for the first thirty scripts was extrapolated to determine the kinds of activities to use in later programs.

Another aspect of production procedures was the distribution of supplementary materials to closed sites, a responsibility of the field services staff. The amount of time and effort involved in this distribution prompted a study of distribution by an outside firm. However, since subcontracting distribution would have added more than 60% to the cost of supplementary materials, it was rejected. To facilitate distribution, teacher's guide updates were changed from bi-weekly to monthly publications. This change enabled student magazine and teacher's guide mailings to coincide.

OPEN SITES

The student magazine and teacher's guide were designed originally for STD closed sites. The largest portion of the audience, however, viewed the programs over local broadcasting stations. Although the STD was not required to provide service to these open sites, input indicated that many wanted supplementary materials. This presented several complications:

(1) Most open-site schools did not wish to purchase consumable materials either for reasons of economy or because Title II funds could not be used for such purchases. The printed materials, on the other hand, were not designed to be reused second semester, since they would be revised based on first semester user input. Obviously contrasting needs existed. This explains why open-site sales were twice as large first semester as second semester. (First semester, 9,562; second semester, 4,086.) Many schools reused first-semester materials despite incorrect sequence and the lack of desirable revisions.

(2) The printed materials were not designed for marketability but were planned for specific users. Although overall production cost was not large, the unit cost was relatively high. (Student magazines cost $1.14 and teacher's guides, $5.20 per semester.) When costs of shipping and billing were added, outside schools had to be charged $1.85 for student magazines and $7.00 for teacher's guides. Many schools thought these prices high and wondered why a single, cheaper student guide was not available. Again a conflict existed between specific desires of open sites and other STD priorities.

(3) The STD was neither equipped nor staffed to handle packaging, shipping, or billing to outside purchasers of printed materials. To avoid these tasks and their related overhead

costs, the STD arranged for the major printer of the materials to serve as the distributor. The printer accepted orders (channeled through the STD field network), packaged and shipped all materials, and billed the schools directly. In return, the printing firm was allowed a modest profit and was guaranteed payment.

RESULTS

Although considerable modification of materials took place before first semester printing began, the first semester publications were not designed as final products. They were considered "final drafts" in the same way as were the television program segments. User input and reaction during the initial semester would be incorporated into revisions for second-semester printing.

The research staff provided formal statistical printouts of general student and teacher acceptance of the printed materials. Overall, 45% of the first-semester students at STD school sites rated the student magazine "good" to "excellent." During the second semester, teachers at the schools rated the "message effectiveness" of the student magazine at 3.74 on a scale of 1 to 5. The teacher's guide was rated at 4.56 on the same scale.

Although the instruments used by researchers provided helpful data concerning overall acceptance, they were not designed to, and did not, provide information specific enough to dictate second-semester modifications of the materials. To offset this concern, research and field service personnel were asked to set up student committees at site schools to review student magazines and send comments to the STD. These reports were useful in determining which activities were well accepted and which should be deleted. For example, rebus puzzles were more popular than "hidden objects" puzzles; photographs of persons in occupations were more popular than artwork of the same scenes or articles about careers. These preferences were incorporated into second-semester revisions of the student materials.

One problem encountered with this subjective input was student inability to distinguish between the program and the printed materials. If students did not like a particular program, they sometimes rated the printed materials poorly, even when the published activities

were similar to ones highly accepted on other days. For example, although students expressed dislike for the cartoons of a character named "Dr. Dot" in the magazine, it was difficult to determine whether they were reacting to the printed material or to the character of Dr. Dot to whom they had already been exposed in the television series.

RECOMMENDATIONS

The experience of those involved in the STD print media effort suggests several recommendations to others who may undertake similar tasks in the future.

Staff

The production and distribution of STD supplementary materials was accomplished with only one full-time staff member, the Print Media Specialist. In future efforts of this magnitude, if time is the primary constraint and funds are available, consideration should be given to the employment of additional staff: (1) an experienced Print Media Assistant whose duties would include typing for paste-up, proof-reading before paste-up, paste-up, and the supervision of the distribution system; and (2) a mail or shipping clerk whose duties would include packaging and forwarding materials to the sites.

Needs Assessment

Investigation of users' specific supplementary materials needs should be incorporated into the overall project needs assessment to provide initial guidance for developing the formats of the printed materials.

Research

The design and revision process would be streamlined by (1) effective and timely coordination between Research and Print Media staff to assure useful input for revision and modification; (2) clear specification of the kinds and sources of incoming field data and of the priorities for revisions based on this input; and (3) more extensive use of direct personal discussions between students and print media staff to facilitate design and revision.

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CONCLUSION

The goal of supplementing the career education series with print materials resulted in the design and production of a student magazine and a teacher's guide which integrated entertainment value and educational content and which were generally well accepted by student and educator users.

The "Time Out!" series produced significant gains in the students' career-related knowledge in the areas of decision-making and self-assessment. The relative roles played by the supplementary materials and the programs themselves in the achievement of these gains cannot be determined from the available research data because tests administered to measure student benefits from the "Time Out!" series did not distinguish between the printed materials and the television programming. It can be assumed, however, that the supplementary materials made an important contribution to the success of the series.

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