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ABSTRACT

The Satellite Technology Demonstration (STD) created a planning or formative process in the creation of an educational television series. The STD recommendations were: (1) define the process, in-depth, before developing the process; (2) make certain the process can adapt to unforeseen developments; (3) test the process by converting early scripts into video products for script review; (4) analyze the procedures; and (5) verify the results. This document details the use of this formative process on the development of "Time Out!"--a career education series designed for junior high school students and transmitted by communication satellite. (NR)

SATELLITE TECHNOLOGY DEMONSTRATION

FEDERATION OF ROCKY MOUNTAIN STATES, INC.

technical report

TR0210

THE FORMATIVE PROCESS USED BY THE SATELLITE TECHNOLOGY DEMONSTRATION IN THE DEVELOPMENT OF TELEVISION PROGRAMMING FOR JUNIOR HIGH SCHOOL STUDENTS

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INTRODUCTION

From 1973 to 1975, the Satellite Technology Demonstration (STD) implemented a comprehensive series of steps -- called the "formative process" -- to design, develop, and refine television programming for junior high school students. The programming was titled "Time Out!"

This paper reviews the purpose for a formative process, as well as the resources needed to implement it, and describes briefly the step-by-step procedures involved in the process. The paper concludes by discussing the results of the STD's formative efforts and by presenting recommendations for similar future applications.

PURPOSE

The "Time Out!" student program, developed through the formative process, benefited junior high school students by increasing their knowledge of, and enhancing their attitudes toward, career-related concepts. To achieve these goals, the "Time Out!" program centered on three areas: decision-making, self-assessment, and job awareness. These areas were specified in 27 objectives.

The formative process, implemented to insure that the "Time Out!" series achieved the prescribed objectives, required major investments in manpower, time, and money. But it was better than the alternative process of producing and distributing an untried product.

If a product proved to be inappropriate or ineffective, it would have to be revised. Revisions are expensive. Further, an untested product provides students with a haphazard -- and often, ineffective -- learning experience. The formative process, however, not only minimizes the risk that the program will be "off target," but also facilitates the integration of resources, as well as identifies decision points for Project personnel.

RESOURCES

Several resources are necessary to implement a formative process. For the process to be viable, management and program personnel must be willing to support the revision of programs and program elements that are not achieving specified objectives. In short, a formative effort is based on commitment. Other necessary resources include: access to representative products; access to representative populations; and sufficient "lead time" for sequential steps.

STEP-BY-STEP PROCEDURES

The formative process implemented by the STD involved 16 sequential steps. Figure 1 on the following page lists these steps. Note that the steps form four clusters:

1. Identification and development of content (Steps 1.0 through 3.0).
2. Development and refinement of scripts (Steps 4.0 through 8.0).
3. Production and refinement of video products (Steps 9.0 through 13.0).
4. Refinement of television programming during the operational period (Steps 14.0 through 16.0).

Cluster 1: Content Development

Figure 1 shows that the development of the "Time Out!" content began by identifying and clarifying user needs (Step 1.0). A comprehensive needs assessment was conducted to obtain input from State Department of Education personnel, local school personnel, and junior and senior high school students. This input provided information on student interests, awareness, and needs in the area of career development, as well as on past exposure to television programming.

The next step in the development of the "Time Out!" content involved creating a content structure and identifying appropriate formats and delivery vehicles (Step 2.0). Several age ranges and program formats were considered before the needs assessment. But fiscal limitations and preferences expressed by federal, state, and local personnel led to a decision in

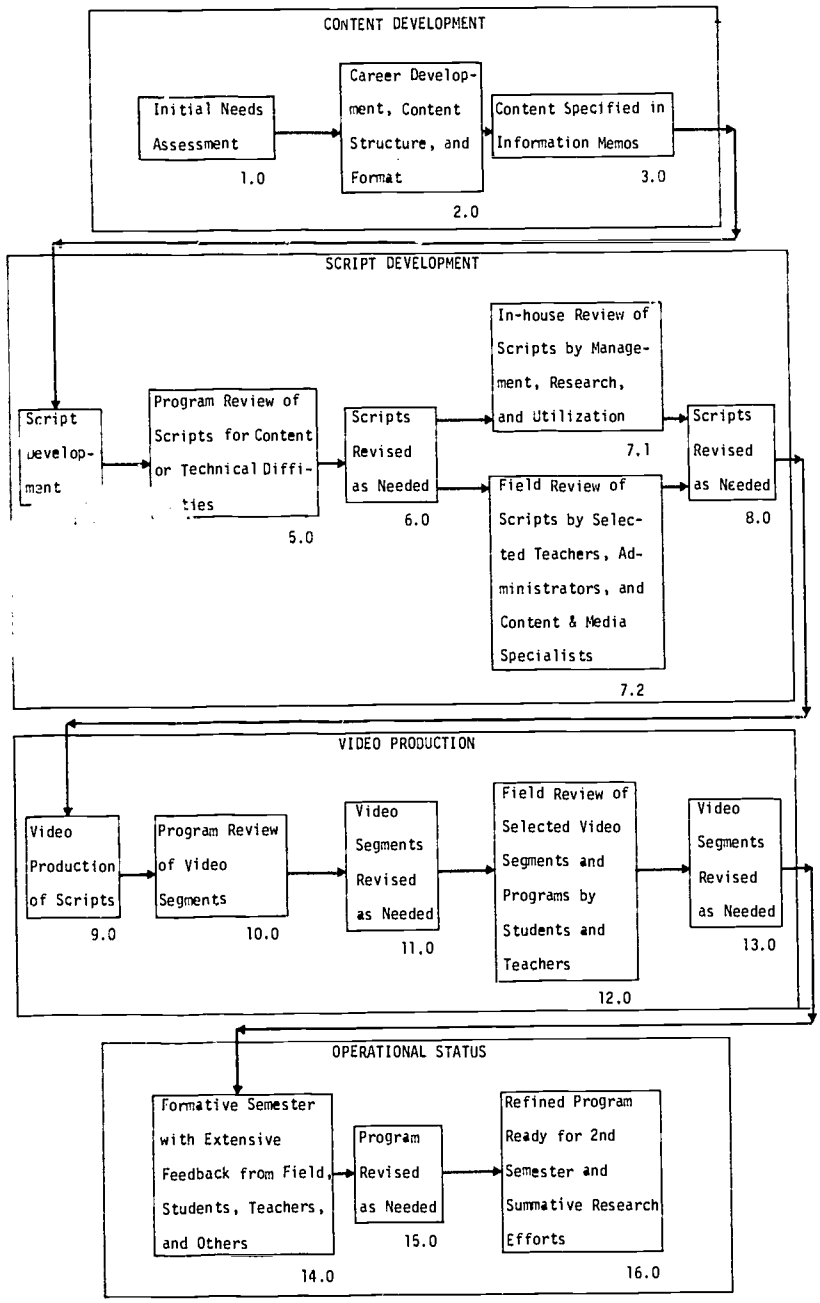

Figure 1. The Formative Process for STD Student Programming ("Time Out!")

spring, 1973, to aim programming at junior high school audiences.

The needs assessment indicated that junior high school students were very interested in space-age technology; this helped in selecting an appropriate format. General content considerations included:

1. Other needs assessment data; for example, educational surveys conducted by various state agencies.
2. Available career education, development, and guidance models.
3. Existing film resources to supplement the curriculum.

These inputs helped the STD to design a curriculum featuring self-assessment, decision-making, and occupational awareness -- all of which were high priority topics for junior high school students. The central theme was time travel.

Once the content for the overall series was specified, it needed to be organized into programs (Step 3.0); a spiral approach was used. The key to this spiral was occupational awareness, based on the Dictionary of Occupational Titles. With a spiral approach, all the occupations were presented briefly in the first program in the series; succeeding programs covered the occupations in greater detail.

Content specifics were recorded in information memos. Each memo identified program objectives, suggested general themes, and contained supplementary information for television script writers.

Cluster 2: Script Development

Professional television script writers used the information memos to generate incidents, appeals, and dialogue that would present the desired content in an effective and acceptable manner (Step 4.0). The script produced at this step was comprehensive. It identfied all dialogue, settings, and action, as well as any existing material to be integrated into the program.

The script now moved to Step 5.0. Here, it was reviewed by content and production personnel. Questions answered included:

1. Did the writers integrate the content in a manner free from distortion?

2. Did the writers leave out any salient content?

3. Was the script, as presented, technically feasible?

Because the STD used multidiscipline teams -- composed of content and production personnel -- in the development of programs, ma[illegible] problems seldom were identified in Step 5.0. Those problems that did occur were solved quickly by revising the script (Step 6.0). At this point, the script was approved by content and production personnel and was ready for broader distribution and reaction.

Step 7.0 included two reviews. An in-house review of the script by other Project personnel was first. This gave personnel from management, research, and field services an opportunity to offer suggestions; it helped to generate some meaningful feedback and, more importantly, to create product awareness and identification among the team.

A review by persons outside the Project was second. Here, a panel of 72 people, nine per state, read the scripts and provided constructive criticism. Panel members consisted of: junior high school personnel (teachers, counselors, and administrators); State Department of Education personnel (career-development specialists and media specialists); and representatives from the Public Television Stations in the eight-state region.

As scripts became available for field review, cross-section samples from the panel population were drawn. This meant that no one panel member was responsible for reviewing all the scripts. As a result, panel members could devote more time -- and consequently, provide better input -- to the scripts they did review.

The review by panel members yielded two types of data: objective and subjective. Not only did the members rate the scripts, using a scale provided by the STD, but they also inserted their own comments and suggestions by pencil editing the scripts. This data was used to guide script revisions (Step 8.0). The revised scripts now were ready for production.

Cluster 3: Video Production

Because the STD's "Time Out!" program involved a compilation of segments and formats, it was impossible to produce each program as a separate entity. Instead, several episodes,

using the same set and talent, were produced at once; these episodes then were integrated into the appropriate programs. The production of video segments and formats constituted Step 9.0.

Once video segments were available, they were reviewed carefully by production and content personnel for technique, quality, and consistency. This review, Step 10.0, resulted in minor revisions; the revisions completed Step 11.0.

After the initial in-house review and subsequent revision of scripts, video segments and some limited programs were presented to rural and urban junior high students and their teachers (Step 12.0). Because of temporal and fiscal constraints, only limited field review of video materials was possible (Step 13.0). Feedback from this review, however, resulted in some modification of segments, formats, and roles, as well as in a general endorsement of program style and content. It also helped to insure that the programs generally were "on target." With this insurance, program production continued, thus completing the series for the third period.

Cluster 4: Operational Status

"Time Out!" ran one semester; thus, it was possible to distribute the series to an audience the first semester, then to make revisions before showing it to a second audience the next semester. The first semester became a comprehensive field test, known as the "formative semester" (Step 14.0).

During the formative semester, an extensive data base was assembled to determine program acceptance and effectiveness and to guide subsequent revisions. Recommendations for revisions came from: daily and quarterly student and teacher acceptance ratings; content analysis of audio and written materials; in-house technical reviews of programs (by Project personnel); and out-of-house critical reviews of programs (by selected teachers).

These recommendations were reviewed by content and production personnel, who then determined whether an element or program should be revised. Three priorities were established:

1. Revise segments or characters which, in several programs, have a negative impact on the audience.

2. Revise programs which, in several segments, have a low acceptance rating.

3. Revise programs which are weak in one or more segments, but strong in others.

Because general acceptance of the "Time Out!" series was high and because fiscal constraints precluded revisions except where necessary, only modest revisions occurred between the two semesters (Step 15.0). These revisions dealt primarily with refining "voice-over" narrations of video film clips, smoothing transitions between segments, and modifying characterizations that received less than positive acceptance. The final version of the "Time Out!" series was distributed the second semester (Step 16.0).

RESULTS

The formative process was not defined clearly during the early stages of the Project; it should have been an integral part of the initial needs assessment and the development of a content structure, but it was not.

In the early stages of the Project, formative efforts emerged pragmatically. In retrospect, these efforts were clearly appropriate and in the proper sequence. Without a well-defined process or "master plan," however, it was difficult to determine -- and even more difficult to communicate -- where the "Time Out!" series was in its formative development.

In early 1974, the 16-step flow chart described in this paper was defined. The creation of a clear set of steps immediately enhanced both internal and external communications. It enabled various functional components within the Project (programming, research, and utilization) to identify where and how they fit into the step-by-step process. Research and utilization, for example, were responsible for needs assessment (Step 1.0), field review of scripts (Step 12.0), and feedback from the formative semester (Step 14.0). With a clear delineation of the steps, everyone, regardless of component affiliation, was aware of the process being implemented.

While awareness and coordination are both important results of the formative process, acceptance and effectiveness of programs determine the ultimate worth of the effort. The first-semester data indicates that the "Time Out!" series has received widespread student

and teacher acceptance. Equally positive has been student growth in decision-making, self-assessment, and occupational awareness, as measured by pre- and post-tests.

RECOMMENDATIONS

The STD implemented a formative process to design, develop, and refine television programming. Its experience suggests the following:

1. Define the process, in-depth, before developing the product. This may seem obvious, but it is difficult to do, especially when the organization is new, as indeed the STD was, and the personnel represent different disciplines, viewpoints, and priorities.
2. Weigh the alternatives. Be sure that the process can adapt pragmatically to the resources and constraints of the situation. The STD's formative semester, for example, grew out of a need to compensate for studio delays, which precluded adequate early field testing of the programs, and to incorporate relevant research inputs, such as student and teacher acceptance data, into an operational setting.
3. Test the process. Studio delays made it impossible to convert early scripts into video products and show them to script reviewers. As a result, the STD relied heavily on the competence of its content personnel and the perceptions of its reviewers, the teachers and administrators. Did the junior high school students find the programs acceptable and useful? There was no way to answer that question. The STD was, however, fortunate; the script reviewers often were accurate in assessing the students' interests, vocabulary levels, and career-related knowledge -- based on their intuition, not on empirical research.
4. Analyze the procedures. In retrospect, the STD should have committed itself to putting the early scripts into video production, even if this meant subcontracting for "out-of-house" production until "in-house" capability was established. Visual products would have provided the script review team with a context for their efforts; they also would have facilitated the earlier involvement of

actual users, the junior high school students.

5. Verify the results. When the early programs finally were available, they were used to collect data on student and teacher acceptance of the product. But they did little to facilitate data on student learning, which could be tested only over time. Because "Time Out!" is an educational tool, this omission is serious. Content and production personnel relied heavily on acceptance data. Yet, the most accepted segments are not necessarily the most instructionally useful. For instance, input from students and teachers during the operational period would have indicated that these groups felt the less animated and less acceptance-motivated segments had been the most useful. Again, the creation of one or two model programs, through out-of-house capability if necessary, would have been desirable.

In sum, the key to developing a formative process is planning. If you state the problem clearly, the solution is self-evident. If you know the problem, you can develop alternatives.

The STD, for example, needed to know if its programs were "on target." But delays in video production and fiscal constraints, as mentioned before, made early field testing impossible. As an alternative, the STD developed the formative semester. Although field testing, if possible, would have been the best measure of acceptance, the semester did prove useful. It provided an opportunity to test, in an operational setting, not only the video products, but also the supplementary print materials and evaluation tests and procedures. Clearly, this step in the formative process should be given strong consideration by future users of a formative process.

More specific information on the STD's formative efforts can be obtained from the following technical reports:

TR0211, Determining User Needs as a Basis for the Educational Programming of Large-Scale Projects

TR0213, The Contribution of an Internal Review Panel to the Development of Educational Programming

Other papers pertinent to this report include the following:

TR0505, The Use of Courseware Teams for Achieving Content Objectives in Television Programming

TR0506, Developing and Implementing a Content Structure for Educational Television Programming in the Area of Career Development

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