DOCUMENT RESUME

ED 102 713 EA 006 834

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TITLE User Needs and the Development Process.
PUB DATE Apr 75
NOTE 21p.; Paper presented at American Educational Research Association Annual Meeting (60th, Washington, D.C., March 31-April 4, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS Change Strategies; *Educational Development; *Educational Innovation; Educational Technology; Elementary Education; Evaluation; *Formative Evaluation; *Information Dissemination; Information Utilization; Management Information Systems; Needs; Principals; Research and Development Centers; *Research Utilization
IDENTIFIERS Center for the Study of Evaluation; CSE Formative Evaluation Kit

ABSTRACT

An educational development team, working at the Center for the Study of Evaluation to produce the Elementary School Formative Evaluation Kit, saw that its mission was not simply to show that a product meets pre-determined performance specifications but was also to ensure that a product can be readily adapted by the user to the "noisy" conditions under which it ultimately will be used. People are likely to accept an innovation if it is consistent with their professional norms, levels of expertise, and day-to-day responsibilities. It is, therefore, the developer's function to devise a technology for solving a given problem that takes into account the "intentions and behaviors of the target audience." (Author/WM)

USER NEEDS AND THE DEVELOPMENT PROCESS

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AERA Presentation
April 1975
Washington, D.C.

In the area of educational technology, the path which leads from Research through Development[1] to the school setting has been an elusive one. That it should be possible to transform available relevant knowledge into a form that encourages improved instructional practice is accepted with guarded optimism by educators; yet, as educational developers know all too well, the means for doing so are far from perfected. Over $500,000,000 has been spent during the last two decades researching and developing materials and procedures aimed at improving public education. (Gideonse, 1969) But, as Hood (1973), Eidell and Kitchel (1968), and many others have pointed out, the actual impact of such efforts on school practices has been less-than-spectacular. It is little wonder that the educational research and development (R and D) community has turned serious attention to the problems of adoption and utilization of the products they develop.

Recent concern over the impact of products and procedures emanating from educational research and development efforts has been accompanied by a surge of research on the diffusion[2] of educational innovations. Much of this research is directed towards the formulation of frameworks and paradigms for the diffusion process and proposed strategies that can be used by R and D agencies to facilitate the adoption and utilization

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[1]A concise definition offered by the National Science Foundation (1965) describes development as "...the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes."

[2]Katz and others (1963) have defined diffusion as "...the acceptance over time of some specific item -- an idea or practice -- by individuals or groups or other adopting units, linked by specific channels of communication, to a social structure, and to a given system of values or culture."

of their products. For the most part, the research studies begin with the assumption that a particular R and D output is both reliable and valid; the studies then proceed to investigate the effectiveness of a given diffusion strategy to adopt and use these products under varied conditions. While such research has provided insights of undoubted use to R and D agencies, the diffusion literature makes little or no mention of the processes by which the products are developed.

The development of an educational product is generally regarded as a narrowly prescribed set of activities aimed exclusively at devising the technology to solve a defined educational problem. If we follow this reasoning to its logical conclusion, development then becomes simply a process of converting research findings into organized materials and procedures to fill the need defined by the findings. By this same reasoning, if the development team is able to show that the resulting product brings about specified and intended outcomes in one or more practice settings, the developers have successfully accomplished their mission. In other words, the objective of the development process purports to ensure that a product "works," and thus solves the given educational problem. The responsibility of designing support systems for the innovation and for informing practitioners of the availability of the new product is by and large a domain appropriately handled by diffusion specialists or marketing managers.

A question of means

Staff members of the Center for the Study of Evaluation (CSE) Elementary School Formative Evaluation Kit[3] took exception to this problem-oriented view of the development process. We assumed an expanded interpretation of the development mission suggesting that it is not enough simply to show that a product meets pre-determined performance specifications. Rather, we felt that a development team has the additional responsibility of ensuring that a product can be readily adopted by the user to the "noisy" conditions under which it ultimately will be used. Our reasoning stemmed from one commonsensical construct: Although a product may solve a specific educational problem, and the technology may work, still, target users may be reluctant to adopt and use the product if they are dissatisfied with the means by which the problem will be solved.

It is worth remembering at this point that social scientists, particularly those who study the way in which organizations change, have been proposing similar constructs for a number of years. The rationale is quite simple: People are more likely to accept an innovation if it is consistent with their professional norms, levels of expertise, and day-to-day responsibilities. The problem labelled "top priority" by researchers and policy makers may be just one among many problems encountered by practitioners during a normal working day. The identification of high-priority problems or needs is, of course, outside the educational developer's jurisdiction. But it is the developer's function to devise a technology for solving a given problem that takes into account the "intentions and behaviors of the target audience." (Bennis, 1969)

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[3]Churchman, D., Petrosko, J., & Spooner-Smith, L. Elementary School Formative Evaluation Kit, Field Test Version, May 1974.

The designers of the Formative Evaluation Kit were thus faced with two objectives. First, they were to devise a technology that would enable an elementary-school staff to carry out a formative evaluation of a local educational program. The theoretical bases for the evaluation which the technology was to incorporate have been described in the first paper presented at this symposium. It was clear to all of us that the staff was not to develop an instructional product per se, i.e., materials to train school personnel in discrete and transferable evaluation skills. What was required was that the Formative Evaluation Kit provide guidelines for day-to-day conduct of an evaluation while the target school program was in operation. Further, the Kit was intended to help practicing teachers and administrators evaluate the implementation and progress of an existing program without additional outside help; this last condition caused the Kit to be viewed as a "consultant in a book." Additionally, the development task included the design of reusable materials flexible enough for local evaluation of programs varying widely in type, size, and purpose. The sole restriction on the type of programs considered appropriate was that the program's goals were to emphasize *student* outcomes.

The second objective facing the Kit staff-- and the thrust of this paper-- was to identify the means by which the Kit would guide principals and school personnel through the evaluation processes. As Hull, Kester, and Martin (1973) have recently noted, the knowledge base that will assist development teams in predicting the response of a target population to a particular innovation is highly limited. At best, development teams can rely with a relatively high degree of confidence on a cardinal principle

of educational development: Consult with the user. In the case of the CSE Formative Evaluation Kit, this meant following the conventional tryout and revision cycle with special consideration given to anecdotal data gathered through a case-study approach.

The development strategy

In order to promote a smooth transition from the development laboratory into the complex dynamics of the school, the designers of the Formative Evaluation Kit pilot tested their product by asking principals to outline the characteristics they would like to see embodied into a successfully administered local evaluation product. To help them define these desired charateristics, several cycles of pilot testing were set up. The first cycle of pilot testing involved several elementary-school principals from neighboring school districts who were given a textbook-style narrative about formative evaluation. The narrative was in essence a expanded version of the CSE framework for evaluation including suggestions for carrying out specific formative evaluation procedures. As anticipated, the panel of participating principals was pleased to recognize the germ of a product that had the potential of helping them meet state- and district-mandated evaluation requirements. Conversely, though still foreseen, they were highly critical of the "research orientation" of the narrative-style prototype which they had reviewed. Their comments served to develop a user-oriented and more prescriptive set of materials. This revised version of the Formative Evaluation Kit was introduced on a case-study basis into several schools for actual use -- "a consultant in a book" -- for conducting a

formative evaluation. During this phase of pilot testing, CSE staff members were concerned with two dimensions of product efficacy: (1) Did the revised product help principals monitor and improve a program while it was in progress? and (2) In what way could the procedures advocated in the Kit more closely match the requirements of both principals and their instructional personnel? Based on how the product performed according to these two dimensions, the Kit underwent, once again, major revisions in format, tone, and direction. There was little resemblance between this revised version of the Kit and its earlier version, the textbook-style narrative. CSE staff members were keenly aware of the major changes that the refocusing of "research-based" evaluation to "user-based" evaluation had imposed on the Kit. To ensure, however, that the integrity of the original evaluation framework had not been lost in this process of evolution, they initiated another technical review of the procedures (and their rationale) as prescribed in the Kit. Finally, incorporating all the revisions based on the aggregated data from both users and evaluation specialists, the Kit was launched into the field. Forty schools in twenty-seven states are now participating. Data currently being collected from user sites via questionnaires and telephone interviews are designed to help the CSE staff better understand whether the Kit is now satisfactorily meeting the "intentions and behaviors" of the principals and their school staffs as well as help the designers determine whether the Kit is adequately guiding the users towards the improvement of an ongoing program.

Some realities of local school evaluation

The testing cycles just described pinpointed four practical areas of concern reflecting the point of view of the user vis à vis local evaluation of school programs. These four areas are briefly presented below.

1. Time

The reviewer and pilot principals served to underscore a well-known notion: Elementary-school principals normally are busy people. Principals, as a rule, do not have the time, much less the inclination, to become evaluation specialists; in our case, they made it abundantly clear that they did not wish to rummage through the typically theoretical narratives of many R and D products. At the same time, they wished (or needed) to utilize the expertise and resources of their school's own instructional staffs to minimize the burden on each principal's time. The optimum situation for conducting an evaluation evolved from these concerns appeared to be the one in which the principal would be able to delegate or share discrete "do-able" tasks to staff members. In short, the principals did not want another textbook, but rather felt the need for a "cookbook" approach to meeting evaluation demands.

2. Decision orientation

"Had we but world enough and time..." was the sigh echoed by the reviewer and user-principals indicating that they would enjoy speculating on the latest evaluation concepts and their applicability to the school setting. However, to the Kit staff, it soon became evident that principals, in spite of their wistful appreciation of the poet's

longings, had neither the "world" nor the "time" to engage in such theoretical speculations. Instead, the principals opted for a brief, attractive product that was highly readable and that could lead easily to specific, measureable tasks, a decision more in keeping with the realities of the local school operational cycle. In the local school, the principals were typically regarded as the *administrative* decision makers; they in turn openly acknowledged the teachers' responsibility for much of the *instructional* decision making; the teachers, for their part, would rather leave most of the *management-type* decisions to the appropriate authority, that is, the principal. In matters affecting the conditions in which students' learning is to occur, the instructional staff, however, did expect to be consulted.

3. Technical ease

In their capacity as administrators, principals generally are neither statisticians, nor computer experts, research methodologists, nor educational test designers. The reviewer and user-principals emphatically stated that they were busy administrators dealing primarily with matters of school policy and operation. Other than for professional growth, the principals clearly indicated that under ordinary circumstances, they were not interested in using technical skills (e.g., statistics, computer programming, or measurement) to augment their position as decision makers. To the CSE staff, therefore, it became evident that for practical success and feasability, the technical characteristics of any product used to conduct an evaluation should be kept at a minimum.

4. Socio-political concerns

Principals, as suggested by those involved in the testing of the Kit, must answer to many separate, unique (and occasionally, mutually exclusive) audiences, including teachers, parents and community members, and funding agencies. Consequently, any product intended to assist with an evaluation of a local school program must be able to balance the information needs of these diverse audiences. Most importantly, principals must be able to allay any fears on the part of the school staff that formative evaluation is a "judgment" upon individual teaching skills. Equally important, principals must be able to present to parents and the community the rationale supporting a particular educational program and explain how a formative evaluation might enable the school staff to upgrade that program while it is in operation. And, finally, the principal must be able to justify to funding agencies the allocation of resources and provide an explicit record of what has transpired during the instructional program.

From construct to construction

As described earlier in this paper, the process by which the Formative Evaluation Kit evolved from a "research-based" output to one that prescribes the specific means by which users can conduct an evaluation consistent with the CSE framework, did not occur overnight. New features of the Kit were incrementally added and tested as anecdotal and performance data were accumulated and interpreted. Today, the Kit has reached a relatively steady state now that it is in the midst of a national field test. With the wisdom granted by hindsight, it is possible systematically to connect current features of the

Kit to the realities of local school evaluation as they were uncovered by CSE staff members during earlier case studies. Some of the major revisions made in the Kit as a result of these case-study data are summarized in Table 1.

Table 1

Summary of Current Features
in the CSE Elementary School Formative Evaluation Kit
and Their Relation to Case-Study Data

NEEDS EXPRESSED BY USER/ REVIEWER PRINCIPALS	APPROACH TAKEN IN FORMATIVE EVALUATION KIT
1. Time	1. Time
•Limited time for conduct evaluation	•Step-by-step format: Division of Evaluation into "do-able" tasks allows user to proceed one step at-a-time without necessity of first reading entire Kit
•Desire to share some evaluation tasks with other staff members	•Modular formatting: Separate steps permit user to accomplish a defined task within a short period of time or to delegate discrete evaluation activities to other staff members if appropriate
2. Decision-Orientation	2. Decision-Orientation
•Need to maintain an administrative position that calls for action, not deliberation	•Measurable steps: Each evaluation step (through use of Worksheets) results in a specific decision and suggests ways to implement decisions
•Immediate responsibility for administrative decisions such as allocation of time and money	•Resource allocation: Several steps are devoted to the fair distribution and planning of evaluation tasks and to keeping financial accounts of funds spent on the evaluation
•Ultimate responsibility for ensuring adequate conditions for instructional programming	•Frequent consultation: Steps that impact upon student learning involve cooperative decision making with instructional staff

continued

Table 1 (continued)

USER NEEDS	CSE APPROACH
•Minimal interest in evaluation theory	•Prescriptive tone: Each step focuses on ways to apply evaluative principles; discussion of underlying rationale is brief
3. Technical Ease	3. Technical Ease
•Need for evaluative data with high probability of being used	•Evaluation questions: The paradigm for generating useful evaluation questions is accompanied by specific examples encompassing implementation and progress concerns. Emphasis is on data that realistically used, improve the program
•Extremely limited local resources for statistical computation and analysis	•Selection of a suitable measure: An INSTRUMENT SELECTOR allows users to match their evaluation questions to 8 types of measures. A separate step helps the user decide whether to buy or to build an instrument designated as appropriate by the Selector.
•Little or no resources for developing measurement instruments	•Construction of measures: If users decide to develop their own measures, the Kit provides an Instrument Construction Handbook for the following eight types of instruments: CHECKLIST SELECTED RESPONSE TEST QUESTIONNAIRE INTERVIEW RECORDS PERFORMANCE TEST OBSERVATION CONSTRUCTED RESPONSE TEST

continued

Table 1 (continued)

USER NEEDS	CSE APPROACH
•Need for more systematic methods of analyzing collected data	•Review of data: Kit gives instructions for summarizing collected data according to the given Evaluation questions. Emphasis is on use of simple tables and figures. Modified Delphi techniques are incorporated into a step in which the principal and staff make recommendations for program modification according to the data
4. Socio-Political Concerns	4. Socio-Political Concerns
•Need to inform teachers of purpose of evaluation; desire to involve teachers in identification and collection of data as well as in making key decisions	•Staff involvement: Kit suggests that the instructional staff participate in major decisions regarding the effectiveness of the program; sample meeting agendas and memoranda are provided. Users are encouraged to explore the informal sources of information about the program through discussion with staff and observation of side-effects
•Desire to communicate with parents and community members about program goals and evaluation	•Overhead transparencies: A visual presentation that can be adapted by the principal to the specific program. The presentation encompasses both the instructional components of the new program and the formative evaluation
•Need to report to funding agencies	•Report formats: One step of the Kit gives alternate report formats and suggests information that could be incorporated into a report to a funding agency

Highlights and Summary

Most decisions regarding format, tone, and level of specificity of the Kit were influenced by the principals' expressed need for an efficient, action-oriented package. Due to their busy schedules, they preferred concise, attractive, prescriptive materials that led directly to specific

accomplishments. Thus, in the Kit each discrete aspect of the evaluation consists of a short DISCUSSION, followed by instructions for APPLICATION to the local program. In addition, the design of the Kit allows the user to proceed one step at a time, with each step resulting in a decision (e.g., the identification of Evaluation questions) or in an action (e.g., the collection of data). The Kit suggests that one person in the school assume the role of Evaluator. While the Evaluator is to coordinate use of the Kit (and thereby manage the evaluation), some steps can be carried out by other staff members or at regular faculty meetings. In this way the principal, who would most likely be the Evaluator, has the option of defining his role as leader of an evaluation team. Provision is also made for keeping track of the money spent on evaluation activities and for effectively allocating tasks, conscious of the inexorable operation of Murphy's Law, "If anything can go wrong, it will!" The modular format and prescriptive approach of the Kit represents the Kit staff's attempt to ease, not increase, the administrative problems of the principal.

It should be noted here that the most difficult aspect of the development process was to operationalize the theoretical framework on which the Kit was based. The pilot-test data readily showed that elementary schools typically have limited technical resources for statistical computation and analyses, for instrument development, or for computer programming. Further, the collected data suggested that the evaluation design itself must remain simple for two reasons: (1) because the Kit is most likely to be used to evaluate a small program (one or two classrooms), (2) because most schools are unable to implement random assignment of students to treatment or control

groups of any type. This situation is not as bleak as it sounds. Because they can be characterized as *in-house Evaluators*, principals who do use the Kit possess certain types of knowledge and authority which an outside *professional Evaluator*, however competent, cannot possess. For example, a principal is not only familiar with the stated goals of a program, he also is aware about unstated expectations of teachers and parents. This special knowledge puts him into an excellent position for formulating evaluation questions that take into account some of the more subtle aspects of program operation, such as parent and teacher satisfaction with program processes and questions relating to student achievement. Also, the principal is in a position to receive constant feedback from his staff, formally and informally, about successes and failures of the program. Finally, the principal is in a perfect situation to oversee the implementation of recommended changes.

Taking all these facts into account, Kit staff members realized that a local elementary school has available a wealth of resources that can be channeled towards the conduct of an effective evaluation. Thus, rather than offering a highly theoretical -- and technical -- view of evaluation, the Kit presents formative evaluation as a process of asking pertinent questions about program operation (including questions about proper installation of program components, about progress towards the stated goals, and about unanticipated outcomes or (side-effects"); gathering and interpreting data to answer the Evaluation questions; and making changes in the program where appropriate. To carry out these procedures, the Kit provides practical guidelines to help principals and their staffs apply their working

knowledge of the program in a systematic manner. Most steps of the Kit include WORKSHEETS for recording decisions that have been or need to be made; all steps contain an APPLICATION Section which gives specific examples and instructions. The Appendix to this paper presents the objective for each of the 15 Evaluation Steps which together, comprise the Kit.

There are various additional inclusions in the Kit, such as numerous technical aids to assist the principal when it is found that adequate local resources are lacking; an INSTRUMENT SELECTOR directs him to appropriate measurement devices for gathering data which will enable him to answer the Evaluation questions generated in an earlier step. In addition, should the user find available published instruments inappropriate, the Kit includes a separate INSTRUMENT CONSTRUCTION HANDBOOK which provides instructions, geared to the layman, for developing each of the 8 types of instruments found on the Selector. Other steps of the Kit offer concise instructions for collecting data and for displaying findings with simple Tables and Figures.

Kit staff members also discovered that although evaluation has become a fifty-cent word among educational policy makers, to numerous teachers the term hints at reduced classroom autonomy; and to parents, the word may well connote the suspect "educational experimentation." To allay these fears on the part of the teachers, at major decision points during the formative evaluation (such as the generation of pertinent evaluation questions or the recommendation of program changes) the Kit suggests that the Evaluator involve staff members in cooperative decision making. The setting for such decisions can be a regular faculty meeting or informal discussion with

individual staff members. For the parents, the Kit includes short visual presentation with overhead transparencies as a vehicle to facilitate communication with parents and community members about program goals and the evaluation. As for the funding agencies, the final step of the Kit presents a format for setting up reports to funding agencies, an audience of undoubted importance to many principals.

To end on a philosophical note: it has been said that the world is full of many problems -- and an even greater number of solutions. For educational developers who, by the nature of their profession, tend to be pragmatic, the "best" solution to any problem is the one that is implemented. In this spirit, the staff of the Formative Evaluation Kit sought the means to help elementary-school principals and their staffs monitor and evaluate the progress of a local school program. Perhaps, it is by matching means to ends that solutions to some educational problems may, in fact, be implemented.

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APPENDIX

Section I: Ascertaining Decision Areas of Concern

Step One: Reviewing the Program Plan

Step Two: Constructing a Master Plan

Step Three: Developing Evaluation Questions

Section II: Selecting Appropriate Information

Step Four: Selecting a Measurement Strategy

Step Five: Estimating Evaluation Resources

Step Six: Determining Appropriate Measures

Step Seven: Setting Evaluation Deadlines

Section III: Collecting and Analyzing Information

Step Eight: Establishing Communication

Step Nine: Collecting Data

Step Ten: Discovering Unanticipated Outcomes

Step Eleven: Scoring Measures

Step Twelve: Preparing Data for Presentation

Section IV: Reporting Data

Step Thirteen: Making Recommendations

Step Fourteen: Implementing Recommended Changes

Step Fifteen: Preparing Informal Reports

Step Sixteen: Preparing Formal Reports