

Supply- and Demand-Activated Systems

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A systems approach to planning was posed by Duft in the Fall issue of this journal. This article examines the idea that Extension information processes can be divided into two types—supply-activated and demand-activated. The supply-activated process is a one-way flow of information, while the demand-activated process is one of information retrieval. The author not only discusses the significance of these processes, but also their importance to Extension.

COOPERATIVE EXTENSION is becoming more complex . . . that's obvious. Whether by merger with general university extension or by evolution of its old programs and clientele, it's taking on new audiences, new subject matter, and new ways of teaching while giving up few of its old ways. *A People and a Spirit*, if its recommendations are taken seriously, will intensify this trend. Organizing, staffing, and operating Extension programs have become correspondingly complex and call for new conceptual tools for their solution.

One tool is the concept of Extension as a system or part of a system for transmitting research-discovered information and its application to problems of practice. The process, or processes, by which this happens are what's "going on" in Extension.¹

¹ This isn't the only attempt to describe this aspect of reality. For other views and other models, see Burton Kreitlow and Teresa Mac Neil, *An Evaluation of the Model for Educational Improvement as an Analytical Tool for Describing the Change Process*, Theoretical Paper No. 18 (Madison: Wisconsin Research and Development Center for Cognitive Learning, March, 1969), pp. 7-9 (a version of this paper will be published in a subsequent issue of the *Journal of Cooperative Extension*); and David L. Clark and Egon Guba, *An Examination of Potential Change Roles in Education* (Bloomington, Indiana: National Institute for the Study of Educational Change, undated), p. 8.

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There is a danger of confusion of terminology. Mahan and Bollman² urged that attention be given to the interaction between teacher and learner. That interaction is one, but only one, of the many processes that go on in Extension, and Cooperative Extension is only one of many organizations taking part in these processes.

The focus on information processes doesn't contradict Mahan and Bollman's preference for (teaching-learning) process orientation over content orientation. Extension is part of the system by which information is transmitted. For some purposes, thinking about Extension work in this way provides insights into how it can be organized and conducted.

This article examines the notion that information processes in Extension can be divided into two distinct types. One of these types is activated by the "pressure" of new discoveries. The other is activated by the problems brought to it for solving problems to which it responds.

The supply-activated and demand-activated processes differ in more than the means of activation. They are different in purpose, include different elements, and embody different relations among elements. The systems that carry the processes out may also differ in structure and function. As one of the organizations making up these systems, Cooperative Extension participates in and attempts to play a role in both supply- and demand-activated processes. Taking the distinction in processes and systems into account should provide a basis for (1) evaluating old approaches to the Extension task and (2) designing new ones.

The Processes

The two kinds of processes are most easily described by models using conventional flow-charting symbols. Several kinds of elements are involved. *Input units*, shown in the models as hopper-shaped figures, include queries, theoretical considerations, and practical problems and needs. *Subprocesses*, drawn as a six-sided figure, include such things as research, answering, and demonstration. *Events*, symbolized as square figures, are facts and usually result from the action of a process. These include the existence of discoveries, applications, or practices. *Decisions*, shown as diamonds, include tests of adequacy as well as decisions on how to proceed. Finally, *output units*, pictured as inverted hoppers, include publication or response to queries.

² Russ A. Mahan and Stephan R. Bollman, "Education or Information Giving," *Journal of Cooperative Extension*, VI (Summer, 1968), 100-106.

These models have the defects of all such models; the reader should be careful not to take them too literally. A tested practice is shown in Figure 1 as an event resulting from the demonstration subprocess. Advocacy and instruction are shown as other subprocesses. If we were interested in describing advocacy alone, however, we might show the existence of a tested practice as an input element and symbolize instruction as an output element.

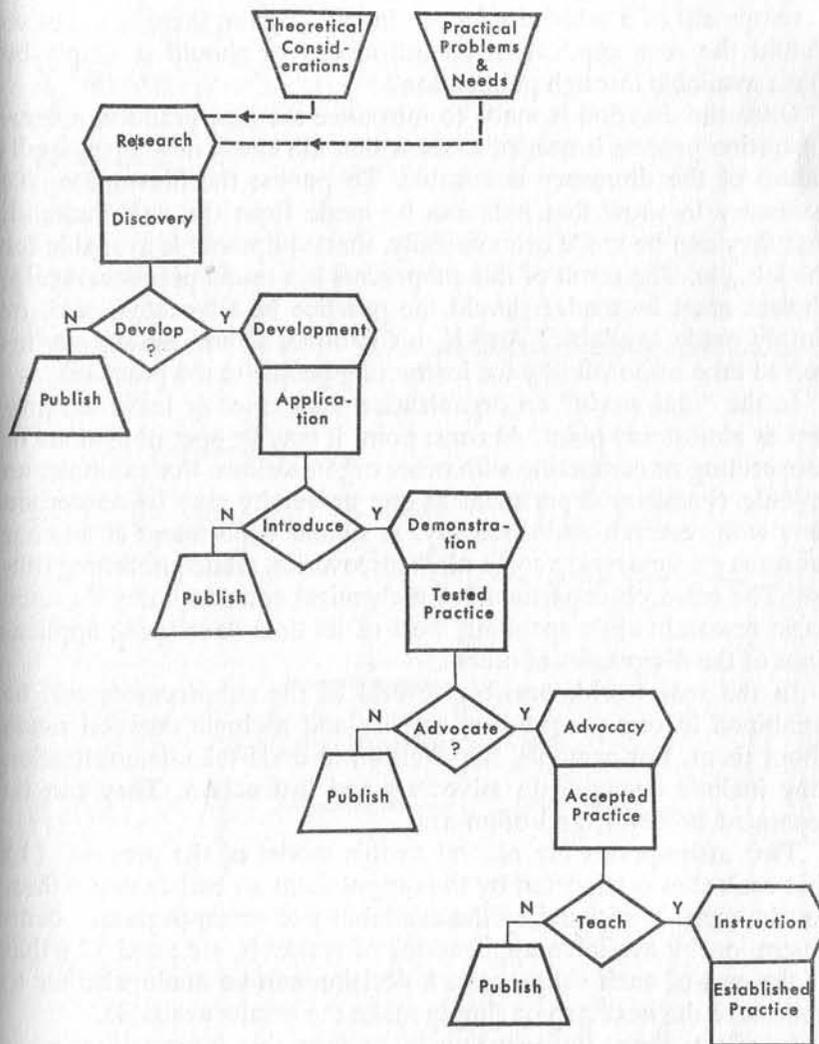


Figure 1. Supply-activated information process.

Supply-Activated Process

The supply-activated process (Figure 1) is characterized by a one-way flow of information. Information is discovered as a result of research. This discovery, in turn, may be developed further or it may be published or made available in some other form.

The availability of a discovery makes a development stage possible which results, if successful, in one or more applications. For example, the discovery of certain synthetic fibers makes possible the development of a substitute for felt in hats. Again, there is a choice: should the new application be introduced or should it simply be made available through publication?

Once the decision is made to introduce the new practice, a demonstration process is needed to show that the newly developed application of the discovery is feasible. To pursue the illustration, it's necessary to show that hats can be made from the new material, that they can be made economically, that equipment is available for the job, etc. The result of this subprocess is a tested practice. Again, choices must be made: should the practice be advocated, sold, or simply made available? And if this is done, should the agency involved take responsibility for instructing people in the practice?

In the "real world" an organization may enter or leave the process at almost any point. At some point it may be operating alone or cooperating or competing with other organizations. For example, an organic chemistry department at one university may be concerned only with research and discovery. A similar department at another university may develop some of its discoveries, while publishing others. The research department of a chemical company may do some basic research while spending most of its time developing applications of the discoveries of others.

In the real world, possibly several of the subprocesses will be combined in one program or activity and a single decision made about them. For example, the decision to undertake demonstration may include engaging in advocacy and instruction. They can be separated however, and often are.

Two assumptions are central to this model of the process: (1) that each step is triggered by the output from an earlier step—thus, development is initiated by the availability of research results, demonstration by available applications of research, etc.; and (2) that at the end of each subprocess, a decision can be made whether to undertake the next step or simply make the results available.

In effect, then, the question is, "Given this information, what should we do with it?"

Demand-Activated Process

The demand-activated process (Figure 2) is essentially one of information retrieval—answering questions or solving problems. It's a two-way flow of information in which the query or problem is attacked by progressively more powerful procedures until a satisfactory response can be made.

If a satisfactory answer to the query is immediately available, a

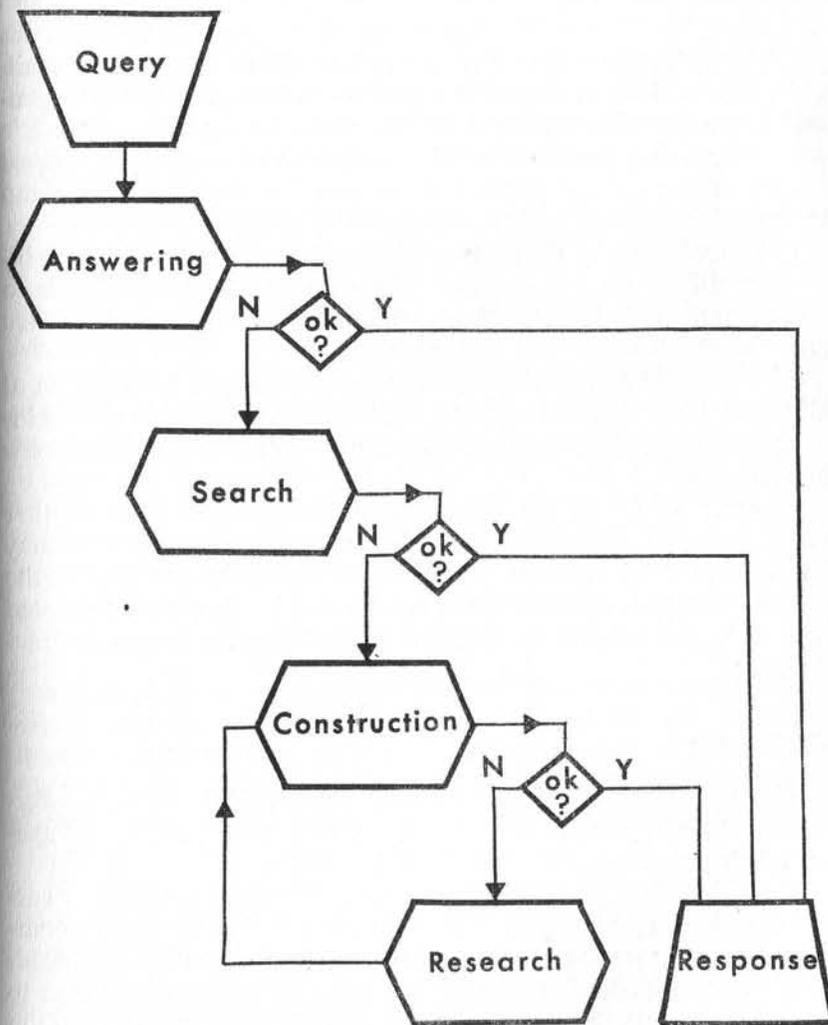


Figure 2. Demand-activated information process.

response is made—if not, a search for a satisfactory “ready-made” answer occurs. If the search procedure fails to produce a satisfactory answer, an attempt may be made to construct one using existing knowledge. If this fails, additional research is initiated so construction can occur.

For example, a resident phones to ask for help. An insect has been discovered on his rosebush. If the insect is recognized, the answer is provided: you have “rosebush biters”—spray every four hours with “rosebush biter killer.” But suppose the agent hasn’t had such a call previously. He says he’ll have to do some checking and call back. He goes to the files to search for the answer and if it’s there he calls back. However, if the immediate answer isn’t available, but he finds information about controlling insects of the general characteristics described by the caller, he could respond: We have found that preparation “Z” is effective in controlling winged insects of the general characteristics you describe. Why don’t you try applying some of that according to directions.

Or, should this be the first incident to be reported of the type insect described, no one will have the answer. The alternative is to investigate. Such investigation can involve research to determine how “rosebush biters” can be controlled.

The demand-activated process requires inputs of information at all levels. Except at the research level, it processes and evaluates information about problems and solutions rather than producing new information.

Systems based on the demand-activated process have another very important characteristic. While the various subprocesses may be performed by separate agencies, the successful working of the systems demands an integration not needed in the supply-activated structure. The referral capability must exist for the system to function.

Significance

These processes are significant only if the variable makes a difference in the way the organizations involved plan, organize, and execute their programs. This variable is important.

Even though a predominately supply-activated organization carries the process from research to instruction, it isn’t necessarily committed to do more than logically develop the information produced. Furthermore, it can elect simply to publish its output rather than to carry the process through to the end. Thus it may restrict both the breadth and the depth of its activities.

These choices don't exist for the demand-activated organization. It exists to find or produce answers. Cutting off a level of the structure or restricting the inputs into the system will sharply affect its ability to do its job. In a sense it is an all-or-nothing operation. It may limit its breadth by limiting the kinds of problems it will accept. But, except for in-house research, it cannot eliminate depth. A demand-activated extension system must be linked to the research output. And it cannot be restricted in its sources below what's needed to fulfill its problem-solving mission. If it is attached to a research institution (an experiment station or a university) whose interests are narrower than the problems faced by the extension agency, it must develop ties to other sources of information. Those ties must be strong enough for the system to work.

Clientele

A demand-activated system assumes that the client is not only a user of the information transmitted, but that he has a problem and is looking for answers. If he has not sought out the system to ask his questions, he is at least presumed to be interested in the answers it has for his problem.

A supply-activated system doesn't make this assumption about its clientele. It goes into action whenever it has something to say. Its true clientele are the producers rather than the users of information. It may seek to reach those most likely to use its product, but it is not necessary to be concerned about immediate problems. Its output is not so much to a man with a problem as to one who is willing to accept and use information or store it for future use.

Planning Processes

On the basis of research in Cooperative Extension and other advisory agencies,³ it appears that, regardless of the process used in demand-activated systems, at some point it is necessary to establish objectives. Such objectives are expressed in terms of audience needs. Content (the information to be transmitted) is selected on the basis of its capacity to fulfill the objective.

There is reason to doubt that supply-activated programs can be planned this way. The purpose of the supply-activated program is to

³ See Mohammad A. Douglah, "Program Planning Research," *Journal of Cooperative Extension*, VI (Spring, 1968), 29-38; and Robert L. Bruce, "A Preliminary Study of Program Building Processes in Cooperative Extension" (Ithaca, New York: Department of Education, Cornell University, 1966), mimeographed.

find outlets or uses for given information. In at least some cases the process starts with an awareness of the information content to be dealt with and proceeds to select ways of using it advantageously. Study is needed to establish what events take place and in what order, but the following might well occur:

1. *Establishing limits of responsibility.* The organization may operate within a set of policies which determine which parts of the process depicted in Figure 1 it wishes to further. Even if these bounds are loose, it must decide at the end of each step whether to publish or move to the next stage.
2. *Determinating inherent possibilities.* At least at the development stage, the information input must be examined to see what applications are possible. This may or may not involve fulfilling a need on the part of some consumer. Possibly a use will be found and developed in the anticipation of a presently nonexistent need.
3. *Finding need.* After applications are developed, it may be necessary to survey the field to find situations in which application can take place. This approach is in contrast to acting in response to an expressed need or to an obvious discrepancy between situation and objective.

It's possible for events other than these to occur in supply-activated planning. It's also possible that the events described are really no different from those of demand-activated systems. At the very least, the sequence, if not the content, of planning processes will differ from one kind of system to the other.

Planning Procedures

Procedures used in planning demand-activated programs have been discussed elsewhere. Planning supply-activated programs calls for an introduction of, or greater emphasis on, the following activities:

1. *Analyzing content of material to be transmitted.* This must go beyond selecting the method and order of transmission on the basis of a need. It must include deciding what is worth carrying to the next stage. The information users can participate in this activity, but they may be less competent than the producers or handlers of information to perform many aspects of this task. Here's a subtle difference in bases for decisions. The real client of the supply-activated service is the producer of information. It's the interest of the producer or transmitter rather than of the

user of information that determines what's worth doing.

2. *Making decisions about whether to proceed.* This task also calls for expert knowledge and/or little authority to which the user of the information may contribute little. Again, the direction of responsibility enters this question.

In short, most procedures in supply-activated planning call for the assembly of competent experts empowered to make decisions. Only at the advocacy and instruction (and to a lesser extent at the introduction) stages can the information users contribute much more to planning than providing a reading on how receptive the audience may be.

Importance to Cooperative Extension

Assuming these models describe what's going on, one may well ask what relevance and significance they have for Cooperative Extension. Extension participates in both processes. To the degree that its programs are based on local needs and to the degree that it exists to answer questions people ask, it is demand-activated. In fact, the demand model is almost a stereotype of one view of Extension work. On the other hand, certain functions of even the most demand-oriented Extension Service are supply-activated. Staff training, for example, is supply-activated, and so is the introduction of new practices.

Increasingly, as extension efforts at universities are integrated, Cooperative Extension is expected to carry out supply-activated functions in addition to servicing its old clientele. It's also apparent that Extension is not the only organization involved in either process, even for a narrow range of subject matter or a small audience. It may work in cooperation—or competition—with other governmental, educational, or commercial organizations, or even with other parts of its own institution. To the degree that several organizations interact regularly to carry out one or both of these processes, they constitute a system and may have problems that must be solved at the system level. Other problems of the component groups cannot be dealt with effectively unless the system and the processes are understood.

Faced with the problem of assembling or organizing resources, the Extension worker might ask what process is involved, what function he's performing in that process, what other individuals or organizations are involved, and what functions they perform? In short, what's going on here?