

NEEDS ASSESSMENTS: INTERNAL AND EXTERNAL

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In recent work, it was suggested (Kaufman, 1977) that there were at least six varieties of needs assessment, one for each of the six steps of a "system approach" model (Kaufman, 1972). Based upon the starting assumptions or the actual data on hand, one could start a needs assessment at any one of the six steps.

One could start with an "alpha" needs assessment, for instance, which had no "givens" or sacred cows, and thus could look at any presenting set of problems or any situation and not have to assume much about currently operating organizations or existing policies or regulations.

A "beta" type needs assessment starts at the second system approach step, and usually assumes the validity and usefulness of the organizations which frequently sponsor or initiate needs assessments.

Four more possible varieties of needs assessments were identified; one for each of the remainder of the six steps of the generic system approach problem identification and problem resolution process. It was intended that this taxonomy of needs assessments would allow educators and other would-be problem solvers to know that different varieties and possibilities for conducting needs assessment were available, and the choice of one over others would be based upon knowledge of the possible array and thus be most responsive to the problems and organizations being addressed.

This paper deals with a possible way of separating these six modes of needs assessments into two "bundles" or types: internal and external.

Internal View of Education —The Way It Is—

Most educators are hired, fired, and nurtured by an organization; a school, a district, or an agency which monitors or oversees these others. Thus any changes and problems which arise naturally tend to be viewed from the perspective of that organization. From this perspective, any presenting problem, if we are part of a school district, is seen as an educational problem within the context of that district. If we were in a state educational agency for instance, that educational agency along with its policies, procedures, and history would become the frame of reference for thinking and doing. This might be best viewed as an "inside" view of a problem or problem context, and this perspective assumes that the organization in which the individual finds oneself is the proper starting point for planning, changing, or doing. This further assumes that the organization is basic, unyielding, and is the bedrock for change.

And why not? They pay the salaries, make the promotions, assign the offices, determine success and failure—why should not that organization and those bosses and opinion leaders be the beginning and end for all activity? The value placed upon personal and organizational survival seems to “drive” this perceptual frame.

External View of Education —The Way It Should Start—

The simple truth is that what the schools do and what the schools accomplish is of concern to those who depend upon the schools, those who pay the bills and those who pass the legislation. We are not in a vacuum, and our results are seen and judged by those outside of the schools—those who are external to it. If educators are unthreatened by the concept, we will admit that the schools are a process, a means to an end for survival and contribution outside of the schools, upon legal exit from the education agency. Graduates and those legally leaving our schools might well be minimally (not maximally) judged by the extent to which they are able to exhibit behaviors and attitudes which result in their being able to survive and hopefully contribute in the world of work, world of play, world of families, and world of relationships—an external view of our education and our results (Kaufman, 1972).

This “external” referent should be the starting place for functional and useful educational planning, design, implementation, and evaluation—if education does not allow learners to live better and contribute better, it probably is not worth doing, and will probably end up being attacked and decimated by taxpayers and legislators.

Needs Assessment—Starting off Right

There are many models, varieties and concepts of needs assessment (cf. Gagné, 1977) as pointed out in the previously noted taxonomy suggestion; none are either correct or incorrect, the only question concerns which one is most appropriate for any given application.

The most basic (and useful) form of a needs assessment determines the gaps between current outcomes and required or desired outcomes based upon external survival and contribution. It reconciles differences among the educational partners of learners, educators and society, and places the needs (outcome gaps) in priority order for intended action. This is an “alpha” mode of needs assessment

—the mode which takes an “external” view of the world in order to determine needs and their utility.

It is a gap analysis which determines the discrepancies between current results and required results, places these gaps in priority order, and selects those gaps of highest priority for action—for closure.

Since it looks at gaps in outcomes, not in processes¹, an alpha-type needs assessment is critical if one wants to identify problems before they try to solve them. It is a vital starting place for achieving educational success.

The central point is that an outcome gap analysis, which best starts at the first step in a system approach is a way of determining the problem to be addressed. The starting place, or the assumptions inherent in a selected starting place (e.g. assuming that the organization is the proper context for understanding and solving the problem or assuming that a teaching method is correct and trying to plan its implementation, etc.) is important in determining which problem will be addressed, and thus what the solution will look like and eventually accomplish (or not accomplish)².

Much has been written on Needs Assessment, and the interested reader is directed to many of the writings listed in this bibliography and elsewhere.

Internal Needs Assessment —The Way It Is Usually Done—

When most educational agencies embark upon a needs assessment, they usually start with an analysis of the discrepancies between current student behaviors and accomplishments and goals and objectives for that accomplishment. The current goals, objectives, policies, laws, rules, regulations, and procedures are thus seen as “given”, fixed, and generally unchangeable.

Gaps (needs) thus harvested are in relation to the goals and objectives of the organization, and these goals and objectives are *assumed* to be valid, valuable, and having utility and worth.

¹The word “need” in this context is only used as a noun to note a gap in outcomes and never a gap in process or how-to-do-its, when the word need is used as a verb or in a verb sense.

²The system approach model, as a generic process for identifying as well as solving problems (Kaufman, 1972) is the underlying referent here. Those not familiar with this model are encouraged to review it.

In the earlier taxonomy context, this mode of needs assessment is “beta”, since it starts with the “givens” of the organizations which sponsor it.

Gamma, Delta, Epsilon, and Zeta needs assessments, in similar fashion, are also seen as “internal” needs assessments since they also operate within the context of existing organizations.

While these modes of needs assessments are necessary to the accomplishment of the system problem-solving approach, and indeed will eventually be performed when using the system approach to problem solving—it should be carefully noted and understood that they begin with the acceptance and understanding of all of the assumptions associated with starting analysis and planning with preconceived goals, objectives, policies and rules of an organization already in place and operating. This reduces and limits the degrees of freedom for revision and renewal to the borders of that organization or starting referent. For instance, consider the problems of trying to use needs assessment data to convince the management of a now-defunct railroad that they were not in the correct business in the first place—that they should be moving cargo and people, not running railcars from here to there! Being “locked-in” to an organization usually means that you can only change within that organization, and usually cannot redirect that organization’s goals and purposes.

So acute is this problem that Reusch (1975) warned that in our society deviations in means are considered to be only misbehaviors, while deviations in goals are considered to be subversion!

Changes to the organization other than “tinkering” with the means, the how-to-do-its, have serious consequences. The implementation of an external needs assessment, then, is a serious proposition which should be undertaken knowing that there is a distinct possibility that the people in power might not look kindly toward the results, or the major changes it might suggest.

External Needs Assessment —The Rational Starting Place—

As we noted earlier, the external view of education starts with looking outside of educational agencies for the “payoffs” of the education enterprise and endeavors. Do children learn anything which they can use when they go to the outside world? Do learners have anything which is worthwhile when they leave the

school? Does the educational intervention have any utility when the halls of education are passed through and life outside begins? It is to this life outside, now and in the future, that an external needs assessment is addressed. Do the results outside of education have validity as well as utility?³

In an external needs assessment, criteria from actual performance (now and in the future) is used as a template for designing the goals and objectives of education (to form the basis for internal needs assessment and thus internal criteria for validity and utility) and for then selecting the best methods and means for achieving these outcomes.

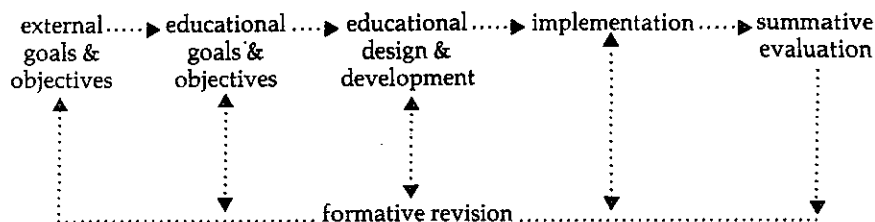
Thus there seems to be a natural, logical, even rational progression for design and accomplishment which would lead us, in the planning, design, implementation, evaluation and revision of education in this manner:

Seen in this way, the starting point for educational planning and accomplishment are the realities outside of schools and school districts (and this concept is equally important in business and industry, the military, and government in order that the effort does more than seek its own continuance and makes a contribution, and in the case of business and industry, shows a proper return on investment).

Some Arguments Against an External Needs Assessment

Most people feel that they can only do what they were directed to do within the confines of good sense and judgment within their organization. This is good sense in a world which, as Reusch (1975) pointed out, tends to reinforce the status quo, and to look at even deviations in means as misbehaviors. Survival, some argue, requires that we do not "rock the boat". If one does rock the boat, then one risks, so that argument goes, losing the job.

³It is tempting to form a new word "ulidity" to identify the dual components of validity (accomplishing stated outcomes) and utility (having recognized worth). Thus, outcomes having internal ulidity would be prized within an educational agency, while outcomes having external ulidity would be valued in the society and community within which the schools operate in terms of making a contribution to that external community. Most educational efforts today are striving for internal ulidity while this presentation intends to encourage the addition of external ulidity to the efforts and accomplishments.



Others feel that the world will not understand basic and major shifts and redirections, that changes should be made piece-by-piece (cf. Kaufman, 1976b), rather than a dramatic, all-at-once shift which could result in what Festinger called "cognitive dissonance".

A third argument goes "we cannot safely and completely predict the future, so it is very risky, perhaps even wrong to go ahead and change the world and the goals and objectives of those social agencies which are now operating." Lack of predictability is seen as reason for not changing.

There is some merit to these positions: it is not fun to get fired, and making errors, especially with large numbers of people, can be tragic. Change is usually more successful if it is seen by those affected as appropriate and at a pace they can "handle". Let's look at these briefly.

Is a job which is destructive, wrong or even unproductive, worth having? What are the individual job-holders' value systems relative to contributing to their fellow citizens and getting a regular paycheck? This unwillingness to recommend change, no matter how critical the change, is one which is often observed, but not often admired when seen in this light.

Moving slowly has much more merit than moving quickly and failing—if that is the choice. We do not want to change so quickly that the change attempt is abortive, and the changes never get accomplished. But an external needs assessment, if done with skill and objectivity, will yield information relative to change requirements, including the discovery of possible blocks to change so that the change, whenever required and necessary (but never for its own sake) may be phased and "gentled" in order for it to be valid, have utility, and be accepted.

The most troublesome argument is the one relating to the lack of predictability of the future. There are no crystal balls

which seem to work well. Is this reason, however, not to try to predict and control the future so that future change will not be destructive? We make some predictions every day (how to drive, where to drive, what to eat and not eat—all based upon predictions of the future) and we must in order to survive. Change in our world is inevitable, the only question is whether we will be the masters or the victims of change. If we have a responsive and responsible method of planning, doing and revising, then we can see where our predictions are becoming incorrect and change in mid-course. Because we cannot completely predict the future is not a rational reason for the maintenance of the status quo. It would seem to make more sense to try to predict the requirements for survival and contribution in the future, and with sensitivity and analysis be willing to, and when required, shift what we are doing as well as how we are doing the job. As things stand now, not using an external needs assessment referent (and thus not obtaining external validity and utility criteria) means that we will just continue that which is now going on, or only find more efficient ways and means to do what it is we are already accomplishing.⁴

The arguments against an external needs assessment might be looked into in terms of resistance to change resulting from a shift from the known and comfortable to the unknown and the possible discomfort which comes with change. The arguments are not without merit, and one tempted to conduct an external needs assessment should attend carefully to the risks before proceeding.

⁴In earlier works, this distinction has been referred to as one between a "system approach" (which takes the external view before progressing with the internal), and the "systems approach" which starts with the internal view (cf. Kaufman, 1972).

Summary

There are two possible overarching referents for needs assessment: one which looks at needs from the point of view outside of the organization doing the study, and one which looks at needs from within that organization. The external view is here called, unsurprisingly, "external needs assessment" and the other is termed "internal needs assessment". Most current activities in needs assessment are of the internal variety.

The external needs assessment is suggested as a rational and logical starting place for organizational effort (including learning design) in that it studies and identifies the skills, knowledges and attitudes which are important outside of the school (or organization) and uses that information as the basis for educational design and effort. The internal needs assessment goes from that point forward to identify internally useful and worthy goals, objectives, methods and means to meet those required and desired out-

comes. Most current effort in needs assessment is of the internal variety, and it is strongly urged that this referent be augmented with the external needs assessment data and information.

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TYPES OF CAPABILITIES AND LEARNING HIERARCHIES IN INSTRUCTIONAL DESIGN

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As I understood my assigned task as a speaker, I was to describe what kinds of skills and competencies should be aimed for in the training of specialists in instructional development, and also to describe how the concept of the learning hierarchy might be used in planning such programs. I realize that I need to speak more generally about capabilities as they might occur in any field of study, not just that of instructional development itself. I hope that my remarks will serve both the narrow and the broad purposes.

The initial thought to be expressed here, it seems to me, is that one has to deal with appropriate levels of generality and specificity. At the more general level, learning hierarchies suggest the techniques of *task analysis* and *classification of program objectives*, both of which are

technologies I believe to be of definite relevance to the design of educational programs. Stating this idea in another way, there are some general decisions to be made in the design of a program of training for instructional development specialists. These have to do with, first, the analysis of projected occupational activities to reveal the kinds of *tasks* required of people in this field. Once this has been done, a further step is to analyze the tasks to see what kinds of learnable human capabilities (sometimes called competencies) are involved. These competencies are then *classified*, in order to identify the general nature of conditions needed for instruction. At that point, the technique of *learning hierarchies* may indeed come into play. What this technique is designed to reveal is the prerequisites for learning the kinds of performances required. Specifically, these are the *intellectual skills*—the en-

abling skills, as they are sometimes called—which may be expected to form a major portion of the objectives of a training program.

Task analysis. Let me then say a few more words about these more general approaches to the design of instructional programs for instructional designers. The first job is, as I have said, making an analysis of what instructional development people do, in order to arrive at a basic list of human tasks.

Methods of conducting investigations of job tasks are rather well known, and have been widely employed in recent years. Some good examples exist in the closely related field of "Educational Research and Development." This field is not simply closely related, but in fact contains many overlapping sets of human tasks, since "educational development" and "educational technology"

are really not always viewed as distinguishable job areas from "instructional development." For these reasons, I believe that studies of tasks required in Educational R & D are excellent models for the analysis of tasks required in instructional development. Three major efforts have been undertaken in this field. One is by a task force of the American Educational Research Association, reported by Worthen and his associates (1971). A second, directed by Schalock (1972), is titled *The Oregon Studies: Research, Development, Diffusion, Evaluation*. And a third is a project of the Far West Regional Laboratory, under the direction of Paul Hood (1973).

These three studies, independently conducted, drew highly similar conclusions about the tasks involved in jobs having responsibility for educational R & D, including instructional development. One study identified 69 task categories, another 197, and the third 280; of course, these represent different levels of specificity, which can nevertheless be made comparable in terms of their content. I cannot, of course, repeat the substance of these lists here. According to the Far West Laboratory report (Hood, et al, 1973), they tend to fall into the following general categories:

1. Collecting information on development techniques
2. Analyzing alternative development solutions
3. Planning and designing for product development
4. Developing a product
5. Implementing the product
6. Evaluating the development process
7. Communicating the development process.

Analyzing and classifying learning objectives. Once we know what the tasks are that are performed by instructional technologists, the next step is to see what they contain in terms of their learnable capabilities (or "trainable competencies"). A certain amount of psychological sophistication is apparently required at this stage. In particular, one is interested in distinguishing competencies that can be learned in an educational program from several other categories: (1) those that cannot be learned; (2) those that can only be learned over a lengthy period of time; and (3) those that are so simple they can be learned at once without a period of training.

In making this kind of a competency analysis, I believe it is helpful to conceive of competencies in terms of certain broad categories of learning outcomes, which I call *intellectual skills*, *verbal information*, and *attitudes*. For the moment I ignore consideration of the two additional categories—*cognitive strategies* and *motor skills*. A brief definition of these categories—five in all—is shown in Figure 1.

Figure 1. Learned Capabilities

TYPE	EXAMPLE
Verbal information	Stating a fact
Intellectual skill	Applying a rule
Cognitive strategy	Originating a novel plan
Attitude	Choosing a preferred activity
Motor skill	Executing a motor performance

The three categories of greatest relevance are, as I have said, intellectual skills, verbal information, and attitudes.

Each of these varieties of competency would seem to be valuable for the instructional developer. Obviously, he or she must possess many intellectual skills, of the sort involved in analyzing human tasks, identifying requirements for instruction, matching characteristics of media, and evaluating the outcomes of new instructional programs. Perhaps not quite as obviously, such a person needs to have considerable knowledge—knowledge about the content of the variety of subjects to be taught, and also about theories which relate such subjects to the changes in human performance which are to be brought about by learning.

I have been interested to note that an article I contributed eight years ago, entitled "Characteristics of instructional technologists" (Gagné, 1969) did not fail to mention the importance of *values* for the instructional developer. (Values are equivalent to attitudes). In particular, I mentioned as a desirable attitude for instructional developers "a belief in empirical evidence as a source of truth and a preferred basis for action." I would therefore reaffirm the idea that appropriate attitudes, along with intellectual skills and verbal knowledge, are valuable for the instructional developer.

I emphasize again that the five categories I have mentioned represent important distinctions primarily because they imply different requirements for the design of instruction. The next four speakers in this symposium will be talking about instructional design strategies, so I will leave that topic to them.

Prerequisites and learning hierarchies.

Now if one has arrived at the point of identifying the tasks for which instruction is to be provided, identifying those that can be learned within a reasonable time, and classifying them so as to know what instructional strategies are needed, much of the work of planning the production of instructional developers has been done. Where, then, do learning hierarchies come into the picture?

It is notable that they do *not* enter into the planning process up to this point. A learning hierarchy is not a tool for planning a total curriculum, or even a total course of study. Instead, learning hierarchies are likely to be useful in determining prerequisites for individual tasks, and for the intellectual skills that these involve. For example, suppose that one of the specific tasks involved in the area of *analyzing alternative development solutions* is a task such as "combining cost and benefit factors to obtain weighted averages." Obviously, this is an intellectual skill which requires the learning of some prerequisite skills (computing cost factors, computing benefit factors, using an expression to obtain averages, etc.). Certainly, the development of learning hierarchies to identify prerequisite skills can be of benefit to the planning of instruction, for a task such as I have mentioned, and for many others having similar characteristics.

Notice that I say (Gagné, 1968) that learning hierarchies are only applicable to the learning of intellectual skills, not to verbal knowledge or attitudes. Nevertheless, as I have just previously stated, I believe that these categories of learning outcomes are at least equally important for the instructional developer to acquire.

Learning hierarchies are often considered to be guides to the sequencing of instruction. However, they also have some other implications for the design of instruction. Basically, a learning hierarchy identifies *essential prerequisite skills* for any given intellectual skill. A prerequisite skill is a capability that must be immediately accessible in the learner's

memory at the time new learning of the targeted skill is to occur. If it is not immediately accessible, learning may be delayed until the prerequisite skill is learned or recalled. If all the necessary prerequisite skills are accessible at the time of new learning, that learning will be very rapid. Evidently, then, this particular set of implications of learning hierarchies for instructional design pertains to the assurance of mastery and ready accessibility of prerequisite intellectual skills.

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