

## Identifying Staff Development Needs of Cooperative Extension Faculty Using a Modified Borich Needs Assessment Model

Randol G. Waters, Assistant Professor  
Larry J. Haskell, State 4-H Leader  
University of Nevada-Reno

Accepted for Publication August 1988

The concept of needs assessment has evolved since the mid-sixties as a direct offshoot of the social action legislation period (Stufflebeam, McCormick, Brinkerhoff & Nelson, 1985). The logic behind identifying educational needs stems from the desire to design and implement relevant educational programs which are based on measurable and achievable goals and objectives. Gathering data from potential clientele and actively involving them in the process of identifying potential educational programs increases the likelihood of implementing relevant educational programs; thus, increasing the likelihood of achieving appropriate outcomes. This article describes an educational needs assessment process which was employed in an attempt to develop a prioritized list of educational needs for extension field faculty.

### Problem Statement

Although the literature related to conducting educational needs assessment is quite abundant, specific literature related to the tools and methods which are useful in the process is somewhat less abundant. One commonly used method for identifying educational needs is the mailed questionnaire. Generally, educational program planners gather initial information about a particular audience and design an appropriate questionnaire to elicit information from that audience regarding its perceived importance of identified topics. Through some logical process the topics are ranked relative to their perceived importance, and educational programs are developed based on the rankings.

Use of such tools as the Delphi Technique (Gordon and Helmar, 1966), Q-sort (cited in Anastasi, 1982), and other self-reporting attitudinal surveys is common in gathering information from potential clientele groups. The effectiveness of planning educational programs based on this type of data is greatly dependent upon how validly and reliably the program planner measures clientele perceptions. One limitation of these more commonly used assessment tools is the difference in criteria individual respondents may use when relating their perceived importance of identified topics. For example, when respondents rate the teaching of a specific skill as very important, are they saying that it is something they need to learn more about, or are they saying they have found this skill to be extremely important to their job functions, and therefore, already know how to do it? The first interpretation identifies a perceived need for more education while the other implies something entirely different.

A needs assessment model developed by Borich (1980) and further used by Barrick and others (1983, 1985) appears to have merit for adding validity to the process of assessing respondents' perceptions about the importance of educational program needs; particularly in the area of inservice education for homogeneous groups of people. Unlike the Delphi Technique and Q-sort methodologies, which simply ask respondents to rate or rank a topic based upon their perceptions of its importance, Borich attempts to

gather additional information from the respondents regarding their current knowledge of the topic and their ability to apply this knowledge. Collecting this additional information increases the likelihood of planning inservice educational programs which will be of most importance. For example, if one were to ask an extension agent how important it was to plan inservice programs related to the use of microcomputers, it is highly unlikely that the agent would not think such programs would be extremely important, since most agents need to use such equipment on a daily basis. Yet, if the agent already has a significant amount of proficiency with microcomputers, it is unlikely that he or she would benefit from or participate in additional inservice related to this subject. By analyzing data regarding perceived importance and current knowledge about a particular topic, one may learn more about the actual need for inservice education than by simply asking how important the topic is. By using the additional information to compute a weighted importance score, a program planner can develop a prioritized list of inservice needs based upon both perceived importance and knowledge of the topic.

An additional piece of information which may enhance the model developed by Borich may be acquired by asking respondents what their opportunity would be for using additional information if it were offered to them. In the previous example regarding the microcomputers, agents might think the topic is extremely important and their existing knowledge might be extremely low. However, if they currently did not have access to a microcomputer and their budgetary restraints would not allow them to purchase one in the near future, their opportunity to use inservice would be low. As a result, the need for inservice related to the topic would also be low.

#### Purposes and Objectives

A primary purpose of this study was to identify staff development needs of extension field faculty in Nevada. Another purpose was to further study the model developed by Borich (1980) and attempt to enhance the model by building upon earlier work completed by Barrick, Ladewig, and Hedges (1983) and Barrick and Powell (1985). Specifically, the following research questions were used to guide the study:

1. What are the current staff development needs of field faculty within the Nevada Cooperative Extension System?
2. What are the relationships among faculty perceptions of importance, existing personal knowledge, and opportunity to use additional information regarding the topics which are identified in the study?
3. Will use of the Borich Needs Assessment Model provide information which will add validity to the findings of the study over that which would be present when using more traditional survey techniques?

#### Procedures

The population was all field faculty employed by the Nevada Cooperative Extension System ( $N = 68$ ). Since the population was relatively small, a census was employed. No inferential procedures were necessary to generalize to the group.

The study required two sequential questionnaires which were mailed to each field faculty member. Each questionnaire was accompanied by an

appropriate cover letter explaining the purposes of the study and how the results would be used. A pre-addressed, stamped return envelope was also included with each questionnaire. Utilizing appropriate follow-up procedures, a response rate of 90% was achieved from the first questionnaire with a response rate of 99% achieved from the second. Although response rates were considered excellent, a study of differences between responses from the first mailing and the second mailing for each questionnaire was conducted. There were substantively no differences between mean responses of early returns and late returns.

The first questionnaire was open-ended in format and asked each respondent to list and provide a brief description of any staff development topics they felt were needed for field faculty. Responses to the first questionnaire resulted in over 350 individual statements of topics. A thorough analysis of these statements resulted in the combining of many of the topics which had similar emphasis and descriptors. The original list of over 350 topics was reduced to 65 non-duplicated topics. The topics were then grouped into nine logical groupings as they related to: (a) teaching methodology; (b) program planning, implementation, and evaluation; (c) professional improvement; (d) program funding; (e) group processing skills; (f) marketing extension programs; (g) technical training in horticulture and plant science; (h) technical training in use of computers; and, (i) extension philosophy. Topics were grouped on the basis of their similarity after analysis. There were no suggested topics or preconceived ideas of what they might be prior to mailing the first questionnaire.

The second questionnaire was developed using the nine groups of topics identified in the first phase of the study. Each topic was listed in random order by group, and three Likert-type rating scales were placed beside each topic. After reading each topic, respondents were asked to rate (1 = low; 5 = high); (a) how important they perceive this topic to be, (b) what their current knowledge of this topic is, and, (c) what would be their opportunity to use information related to this topic in their present job? Respondents rated each topic with regard to the three criteria identified and returned the questionnaires for analysis.

#### Analysis of Data

Although inter-item consistency of the scales was not of major importance to the outcome of this study, Cronbach's alpha coefficients were calculated in order to determine if the earlier logical grouping of the topics into nine sub-groups withstood the test of a homogeneous sub-scale. That is, for each sub-group, did respondents, who rated the overall sub-group high, rate each topic within that sub-group similarly high, and vice versa. With the exception of the Extension Philosophy Sub-group, all scales had calculated alpha coefficients ranging from .96 to .75 with an average alpha of .88. The Extension Philosophy Sub-group contained those topics which tended to be philosophical and perhaps somewhat controversial e.g., discussing the role of an extension staff member as it relates to new administrative procedures. The alpha coefficient for this sub-group was .50. Since some topics were more provocative than others, it was not logical to expect a higher coefficient.

Two sets of weighted scores were calculated for each topic based upon respondents' ratings on each of the three criteria. The first weighted score was calculated as suggested by Barrick, Ladwig, and Hedges, (1983) by subtracting the knowledge score from the importance score and then

multiplying by the importance score. A second weighted score was calculated similarly by subtracting the opportunity score from the importance score and multiplying by the importance score. All opportunity scores were treated as negative statements and were appropriately recoded in order to produce a weighted score which would be comparable to the score weighted for knowledge. The researchers believed the opportunity weighted score should be considered equal to the knowledge weighted score when attempting to prioritize topics so both scores were simply added together and divided by two in order to produce the final score used for ranking each topic. In summary, the following equation produced the score used for ranking each topic:

$$((I - K) \times I) + [(I - O) \times I] / 2$$

- I = Importance Score
- K = Knowledge Score
- O = Opportunity Score

Therefore, scores per topic could theoretically range from +20 to -4. Interpretation of the calculated scores is suggested as follows:

1. A topic which has a negative score would be considered inappropriate for use in developing inservice programs since it resulted from a combination of either a very low importance score, a very high knowledge score, or a very low opportunity score.
2. A topic with a score which is relatively close to zero also would not be considered appropriate since it would seem that existing knowledge of the topic, or the opportunity to use new knowledge, is equal to the respondents' perceived importance of the topic i.e., the respondents' existing knowledge is equal to the current opportunity to use information related to the topic.
3. Those topics having positive scores should be rank-ordered and programming would be planned around those having the highest values.

In order to address the final two research questions, bivariate correlation coefficients and regression equations were calculated using the three criterion scores; importance, knowledge, and opportunity.

#### Discussion

#### What are the current staff development needs for field faculty within the Nevada Cooperative Extension System?

Each topic was rank-ordered by its weighted score and those with highest rankings were selected for planning staff development programs to be presented at the annual staff development conference. Since further analysis of the scores indicated that faculty from the four extension administrative areas differed greatly in their perceptions of needs, it was also decided to develop programs to be delivered in each administrative area based upon perceptions from the faculty of each administrative area. Topics identified as most important based upon the scores of all faculty are listed in Table 1. Only the two highest scored topics from each of the nine sub-groups are listed.

**Table 1**  
**Highest Ranked Topics From Each of Nine Sub-Groupings of Staff Development Needs**

Sub-group	Topic	Score
1.	Teaching Methods	
	- How to utilize distance or remote teaching methodologies in order to reach sparsely populated clientele groups.	7.5
	- How to write and publish quality extension fact sheets.	7.2
2.	Program Planning, Implementation, and Evaluation	
	- How to conduct impact studies which determine long-range effectiveness and accountability.	7.7
	- Developing program evaluation instruments, attitudinal scales, and other surveys.	6.8
3.	Professional Improvement	
	- Using program evaluation data to develop personnel evaluations.	9.0
	- Writing professional goals which are tailored to meet annual evaluation needs.	7.8
4.	Program Funding	
	- Improving grant-writing skills.	9.0
	- How to identify sources of funding for programs.	8.2
5.	Group Process Skills	
	- Effectively managing volunteers.	6.3
	- Learning group facilitating techniques.	5.0
6.	Marketing Extension	
	- How to "package" and market extension educational programs.	8.4
	- How to create the "proper" image for the Cooperative Extension System.	7.0
7.	Technical Training in Horticulture and Plant Science	
	- Identification of horticultural insect damage problems.	4.5
	- Identification of horticultural plant diseases.	3.9
8.	Technical Training in Use of Computers	
	- Selecting hardware and software.	5.3
	- Training in basic micro-computer, use (word processing data management, etc.)	4.6
9.	Extension Philosophy	
	- Discussion of the role of each extension professional as he/she fits into the Nevada Area Administrative Model.	4.8
	- Understanding the extension philosophy and mission.	4.3

**What are the relationships among perceptions of importance, existing personal knowledge, and opportunity to use additional information regarding the topics which are identified in the study?**

Bivariate correlation coefficients were calculated among the three criterion scores in an effort to determine the relationships among them. If the correlation between any two of the scores was high, the logic of using both scores as criteria for determining need would not be supported. However, if correlations were low-to-moderate, each score should be used in the process of rank-ordering the topics. As indicated in Table 2,

correlations among the three criterion scores were low, at best (Hinkle, Wiersma, & Jurs, 1988). The maximum explained variance associated with any two of them was 17% ( $r = .42$ ).

Table 2

Pearson Correlations Among Scores on Importance, Knowledge, and Opportunity

	Knowledge	Opportunity
Importance	.42	.17
Knowledge		.13

Will use of the Modified Borich Needs Assessment Model provide information which will add validity to the findings of the study over that which would be present when using more traditional survey techniques?

Although the answer to this question is perhaps more philosophical than analytical, it would seem logical to explore the relationships among the scores further to determine if the addition of the knowledge scores and opportunity scores is contributing anything to the needs assessment model above and beyond the information gained by simply asking respondents to rank each topic based upon his/her perception of its importance. If one were to study the variance in each of the three scores which is not explained by the other two when they were entered into a regression equation ( $1 - R^2$ ), a determination could be made regarding whether each score was independently adding anything to the model. If most of the variance in the importance score could be accounted for by the combined variance in knowledge and opportunity scores, there would be no logic in using them along with the importance score to determine educational needs since importance would be an adequate proxy of the other two scores. Sixty-one percent of the variance in importance scores is unexplained when knowledge and opportunity scores are regressed upon importance scores. Further, 77% of the variance in knowledge scores is left unexplained when importance scores and opportunity scores are regressed upon the knowledge score. Finally, 78% of the variance in opportunity scores is left unexplained when importance and knowledge scores are regressed upon opportunity scores. No single score, or a combination of any two, is an adequate proxy of the other. Therefore, each score is contributing additional information to the model.

Conclusions and Recommendations

The modified Borich Model described in this article was used in the needs assessment in an effort to more validly measure perceived educational needs of extension field faculty. Based upon analysis of data, rankings of individual topics were substantively different than what would have been obtained using more traditional methods. The additional information appears to add to the validity of the needs assessment process. Based upon these results, the researchers would recommend the use of this needs assessment model in determining educational needs of similar groups of clientele.

## References

- Anastasi, A. (1982). Psychological testing. (5th Ed.) New York: Macmillan Publishing Company.
- Barrick, R.K., Ladewig, H.W., and Hedges, L.E. (1983, Spring). Development of a systematic approach to identifying technical inservice needs of teachers. Journal of AATEA, 24 (1) 13-19.
- Barrick, R.K., and Powell, R.W. (1985). Assessing needs and planning inservice education for first-year vocational agriculture teachers. Proceedings of the Thirteenth Annual National Agricultural Education Research Meeting. December 5th. Dallas, Texas.
- Borich, G.D. (1980). A needs assessment model for conducting follow-up studies. Journal of Teacher Education. 31 (1) 39-42.
- Gordon, T.J. and Helmar, O. (1966). Report on long-range forecasting. Social Technology. New York: Basic Books, Inc.
- Hinkle, D.E., Wiersma, W., and Jurs, S.G. (1988). Applied statistics for the behavioral sciences. Boston: Houghton Mifflin.
- Stufflebeam, D.L., McCormick, C.H., Brinkerhoff, R.O., and Nelson, C.O. (1985). Conducting educational needs assessments. Boston: Kluwer Nijhoff Publishing.