Profile

The Importance of Involving Experts and Learners in Formative Evaluation

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Abstract: It is widely advocated that, during development, instructional materials be reviewed by experts and tried out with learners in order to revise the materials and improve the final product. The role of learners and various kinds of experts as sources of input in formative evaluation is briefly discussed. A case study describing the evaluation of a filmstrip/audiotape program. by experts (subject matter and instructional design) and learners is presented. The results illustrate the importance of gathering feedback from multiple sources before making revision decisions.

INTRODUCTION

The literature of formative evaluation indicates that instructional materials should be reviewed and revised during their development in order to improve them (e.g., Andrews and Goodson, 1980). Some authors suggest that various types of experts be asked to review the materials (e.g., Montague, Ellis & Wulfeck, 1983). Others suggest that materials should be tried out with a sample of the target audience or learners for whom the materials are intended (e.g., Henderson & Nathenson, 1976). The vast majority, however, suggest that a combination of experts and learners be involved in the formative evaluation of the materials due to the different kinds of feedback which each can provide (e.g., Thiagarajan, 1978). article will discuss various sources which can be consulted during formative evaluation in terms of the different kinds of information which each can provide. Then a case study will be presented of a recent formative evaluation project which illustrates the importance of gathering information from a combination of sources rather than allowing a single source to drive revision decisions.

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Experts

For many publishers and curriculum developers, formative evaluation means asking experts of various kinds to review and suggest revisions to materials while they are being developed (e.g., Grobman, 1971; Kline, 1984; Truett, 1984). Even in the field of instructional design some have gone as far as to suggest the exclusive use of experts to review and revise materials (e.g., Montague, Ellis & Wulfeck, 1983) because of concerns about cost effectiveness of tryouts with learners.

Those consulted might include content or subject matter experts, pedagogical experts, instructionaldesign experts and media experts, among others. Each type of expert tends to focus and comment upon that aspect of the material which falls within his/her own area of expertise. Thiagarajan (1978) and Stolovitch (1982) have each discussed in detail various experts and their specific role during materials development. The list below shows the range of information which experts can provide:

- Subject matter *expert:* content accuracy, up-to-dateness, comprehensiveness;
- Pedagogical *expert:* appropriateness of level of language, objectives and content for target population, suitability for use within a specific instructional setting;
- *Instructional design expert:* clarity of objectives, sequence and relationship of ideas within the content;
- *Presentation expert:* technical quality, media, graphics; and
- *Curriculum expert:* compatibility of materials with program and other instructional materials in use.

Learners

While tryouts of prototype materials with learners may be less cost effective than reviews by a few experts, much has been written about the valuable feedback that learners can provide during the materials development process. Only the intended learners can help, for example, to identify where an important step has been left out (a step that may seem obvious to an expert), to indicate whether vocabulary is at an appropriate level, or to demonstrate whether or not the intended learning has occurred. Standard textbooks in instructional design, such as Dick and Carey (1985) and many articles (e.g., Geis, Burt & Weston, 1984; Henderson & Natbenson, 1976; Komoski, 1985; Stolovitch, 1982; Thiagarajan, 1978) present detailed explanations of the use of learners during formative evaluation. Included in these articles are descriptions of aspects such as what kind of learners to use, how many to use, how often to do tryouts, what techniques to use for data gathering and what kind of data to gather. In general, materials that have been revised based upon feedback from learners seem to be more effective than the original unrevised materials.

A Combination of Experts and Learners

Reliance upon experts only or learners only can result in an unbalanced picture of the problem. Involvement of a combination of experts and learners in the formative evaluation

process is widely advocated in prescription (e.g., Dick & Carey,1985; Geis,1986; Kandaswamy, 1980; Stolovitch, 1982; Thiagarajan, 1978; Weston, 1986) as well as practice (Burt & Geis, 1986). Recommendations differ as to level of involvement of both experts and learners, when to involve each in the process, techniques for gathering feedback, and kind of information gathered.

In general, however, the message is consistent. Experts should be used to identify problems within their area of professional competence, but should not be relied upon to accurately predict how the target population will respond to or learn from the materials. Depending upon the kind of materials being developed, one could consult some or all of the above mentioned experts. Learners, on the other hand, should be relied upon to provide feedback about their reactions to the materials and whether the materials actually help them to achieve the intended objectives. Learners cannot be expected to assess whether, for example, new content being presented is accurate, up-to-date or appropriate. .

A CASE STUDY

A recent request to carry out a formative evaluation of an instructional kit gave our research group the opportunity to explore the importance of gathering feedback from both experts and learners. The request came from an executive of Association, a national organization whose main area of concern is world food problems. This group had a clear commitment to the concept of formative evaluation. With the kit slated for distribution to all school boards across Canada in 1987, the organization built into their development schedule almost a full year for tryout and revision of the materials before distribution. An Educational Advisory 'Committee was set up to work with the organization at each step in the development of the kit. As well, a tryout of the kit at 70 high schools across Canada was carried out. High school teachers, the perceived target audience for the materials, were asked to respond to the materials in order to provide feedback from the user's and pedagogical expert's perspective. The fact that formulative evaluation was built into the materials development process is particularly impressive when considered in the light of Stolovitch's findings (1982) that in Quebec, for example, only 1% of materials produced in the schools undergo any kind of formative evaluation.

The Materials

The instructional materials were packaged in the form of a teaching kit. The stated objective or purpose of the kit was to provide a context for understanding the world food issue and a framework for discussion and decisionmaking. It was designed to be used with senior high school students as a complement to a range of courses, such as geography, history and economics. The kit included a 20-minute filmstrip/audiotape, a teacher's manual and a set of resource readings. The unit could take anywhere from several hours to several days to complete, depending upon which activities a teacher decided to implement.'

In the audiovisual presentation the world food problem was developed. First, food was discussed as a global commodity within the world market. It was pointed out that inequities in the market have created a situation in which many do not have enough food and famine recurs. Africa is then presented as a case study within which to consider the causes of famine

(e.g., colonial influence resulting in the production of cash crops, overcultivation, rising populations, droughts). Similar symptoms, it is said, can now be seen in developed countries such as Canada. The need to learn from what has happened in Africa and search for solutions concludes the presentation. The audiovisual presentation was apparently designed to achieve the affective component of the objective (stimulating discussion).

The teacher's manual provided the overall structure for the kit. It included the narrative from the audiovisual presentation coupled with discussion questions that could be asked at specific points. As well, a list of suggested activities related to the resource readings was provided. The resource readings consisted of a series of one page texts on a variety of topics related to the world food issue. The activities and readings were apparently designed to lead towards cognitive components of the objective (understanding, problem-solving and decisionmaking).

We decided to focus our evaluation on the filmstrip/audiotape component of the kit for two reasons. First, evaluation of the entire kit, with emphasis on the teacher's manual and readings, was already done by senior high school teachers at 70 Canadian high schools and we wished to provide complementary information. Second, due to the current time and curriculum constraints that exist in many schools it seemed that the audiovisual component might be used independent of the supporting materials and therefore should be able to stand alone effectively.

Constraints

A number of constraints were operating in this formative evaluation situation: the materials were in an almost final form, we had been called in at the last moment as external evaluators and our portion of the evaluation had to be completed within three weeks. These constraints affected the process in several ways.

Ideally, formative evaluation should occur in a number of progressive steps. The first reviews and tryouts should begin when the materials are in very rough form, (e.g., first typewritten draft of written materials, rough sketches of graphics, a set of handmade or temporary slides with the script read out loud). These can be done with individual learners and experts in a very clinical manner. In this case, the Educational Advisory Committee, which consisted primarily of pedagogical experts from across Canada, did the initial reviews and revisions.

As a result of these initial revisions, the materials we received were already in semi-final form (i.e., the audiotape had sound effects and music, the filmstrip had an almost professional finish). The state of the materials and the fact that we had only three weeks to complete the evaluation had an effect on the methods chosen to gather feedback. It was decided that the tryouts and reviews should be done with groups of learners and experts instead of in one-to-one situations, which are immensely more time consuming. As well, it was decided that it would be most efficient to gather information by using prepared questionnaires instead of general discussions. Again, due to the time pressures, different members of our research group handled distinct aspects of the evaluation which accounts for the differences in the questionnaires which are described below. Such differences are not unusual since few heuristics are available which advocate the best methods to use and questions to ask in order to elicit feedback from participants in formative evaluation.

The Sources of Feedback

The filmstrip/audiotape program was evaluated with several groups of experts and users. Two Faculty of Agriculture professors, specialists in nutrition and economics, provided subject matter expertise. Two Faculty of Education professors and one graduate student provided expertise in instructional design. Eight Faculty of Agriculture graduate students enrolled in an education course on instructional planning provided a unique combination of subject matter and instructional design perspectives. One-hundred and sixty-eight high school students were involved in the learner tryouts. Specific instruments were adapted from the literature or designed in order to elicit a particular kind of information from each group.

Subject Matter Experts (SMEs)

In order to gather information about the content of the presentation, the two subject matter experts were shown the program and then asked to respond to five open-ended items on a written questionnaire. The following questions were included:

- Is the information conveyed by this instructional package accurate?
- Are there any errors in the narrative? If yes, please comment.
- Does the narrative correspond to the filmstrip? If no, please comment.
- Is the content up-to-date? Does it reflect the current thinking in your area?
- Given the general topic "world food problems" and the limitations of time (20 minutes) and medium (filmstrip and tape), what topics would you include in such a presentation?

Instructional Design (ID) Experts

Instructional design experts were included for their expertise in clarity and organization of information. After viewing the program, they were asked to respond to questions designed to determine whether the program adhered to systematic design guidelines. Specifically, they were asked to focus on the following aspects:

- Are the objectives clearly stated?
- Is there a clear relationship between content and objectives?
- Is the information well structured? (e.g., advance organizer, summary)
- Is there a logical sequence of topics?
- Is each topic presented clearly?
- Is the relationship among topics maintained?
- Are the examples appropriate?
- Are there an adequate number of examples?
- Is the content appropriate for the intended audience?
- Is the evaluation appropriate for the objectives?
- Are the media appropriate to the topic?

Agriculture Graduate Students in an Instructional Planning Course

To get feedback on the content of the presentation, eight Faculty of Agriculture graduate students enrolled in an instructional planning course were included in the evaluation primarily for their subject matter expertise. As a group, they were shown the

filmstrip/audiotape program and asked to respond in writing to eight open-ended content related items (questionnaire adapted from Aversa & Forman, 1978):

- Are there content errors?
- Is the content comprehensive?
- Is all the information given necessary? (i.e., Is there anything superfluous?)
- Are there ambiguous content areas?
- Is the content important?
- Is there an appropriate amount of content?
- Is the level of the program appropriate to the level of the audience?
- Does the program present interesting and challenging ideas?

High School Learners

The presentation was tried out with high school learners so that reactions and response of the target audience could be assessed. The filmstrip/audiotape program was shown to six high school classes; a total of 168 students. In an attempt to make them feel like partners in the development process, they were told that their task was to help with the improvement of the materials by critically appraising them. They were then asked to respond, using a scale of 1 (strongly agree) to 5 (strongly disagree), to a 21 item reactionnaire adapted from Abedor (1971). These same items appear in abbreviated form in Table 1.

- I had sufficient background information to prepare me for this lesson.
- I was very sure of what I was supposed to be learning.
- After viewing the program, I felt that what I learned was important.
- The audiovisual equipment often distracted my attention.
- Listening to the tape and watching the filmstrip became boring.
- This program was very well organized. The ideas were well related to each other.
- A professional speaker should be used to make the tape.
- The audiotape moved too fast for me. There was too much information.
- I was bored by the repetition of ideas.
- There was a lot of useless information in this program.
- Often the tape and filmstrip seemed unrelated to each other.
- There was a lot of information missing from this program.
- The examples used to illustrate main points were excellent.
- The vocabulary used contained many unfamiliar words. I often did not understand what was going on.
- Discussion after the program would have helped me to understand better.
- I believe I learned a lot from viewing program.
- I would recommend many changes to the program before using it with other students.
- I think this whole idea of trying out new materials with students is a waste of time.
- I would prefer a textbook or a lecture version of this program rather than the filmstrip/tape version.
- I would like to review parts of the program to understand it better.
- After viewing the program, I was more interested in the subject than I was before.

In addition, they were asked to respond in writing to a few open-ended questions:

- For you, what was the least interesting part of the program?
- What was the most interesting part?
- In a few words, explain what you think the point of this program was.

In a more realistic situation the teachers of these classes would have been asked to use the entire kit with their students and gather information directly from them. As well, the teachers would have been asked to comment on the content, educational value and appropriateness of the package for a specific group of students. Due to time constraints, the teachers of these high school students were not able to familiarize themselves with the complete package. Since this kind of information was being gathered from other teachers across Canada, this aspect of the evaluation was not emphasized.

Results

The results of the evaluations are presented below. The characteristics of the group (e.g., adult expert vs. young learner), the size of the group (e.g., two or three vs. a large class), and the form of the information gathered (e.g., oral vs. written) affected the nature of the results. Feedback from the small groups of SMEs, ID experts and Agriculture students came almost exclusively from discussions, and summaries of those comments are presented. Feedback from the large groups of high school learners came only from written reactions, which facilitated tabulation. As much as possible, these results are summarized in tabular form.

Subject Matter Experts (SMEs)

Although the SMEs were asked to respond in writing to a questionnaire, in fact, they were somewhat reluctant to limit their reactions to written comments and so their feedback emerged from discussions. As anticipated, the SMEs focussed primarily on content issues, specifically accuracy, comprehensiveness and hidden messages conveyed by the program.

The number of hungry in the world is an example of the type of inaccuracy identified, although this later turned out to be a typographical error. In terms of comprehensiveness, the SMEs felt that there was a lack of emphasis on the other significant issues that have contributed to the world food problem, such as social, economic, political, and religious sources of influence. Although it was acknowledged that teacher initiated discussions and activities were meant to complement the package, it was felt that the filmstrip/audiotape program should have independently conveyed a more global view of food problems.

The second category of comments concerned hidden messages. The participants, both from developing areas of the world, felt that the program presented a biased view of the people of developing areas. They also objected to the perpetuation of myths such as "hunger exists because there is not ample food" (there is ample food, they insisted, but hunger exists because of unequal distribution).

The SMEs also commented upon the suitability of the program for high school students. One participant thought that it could be an effective tool in promoting awareness at an introductory level, the other participant was less enthusiastic. It should be noted, however, that the SMEs were university professors without high school teaching

experience. It might be argued that the suitability of materials for a particular group of learners falls more within the domain of pedagogical experts.

Instructional Design (ID) Experts

These experts focussed their comments on design issues. Basically, the comments addressed the original questions and can be summarized in several categories.

The absence of a statement of objectives was the major area of concern for the ID experts. In fact they, were concerned that the learners would not understand the main point of the program without some explicit guidance. Although the Teacher's Manual contained a general statement about the purpose of the kit, it was felt that the audiovisual presentation, being a discrete component, should convey clear objectives independently.

Among the many issues raised were several related to the structure of the content. The ID experts said that it was difficult to evaluate several of the content questions, such as relationship of content to objectives, since the objectives were so vague. While they did say that there seemed to be a progression of ideas, they felt that the use of an advance organizer and summary would additionally clarify the the content and assist the learner in achieving the objectives. As well, there was some concern about the relationship or match between the message of the visuals and the message of the narration.

Agriculture Students in an Instructional Planning Course

While we expected this group to function as subject matter experts, in fact they were also quite concerned with instructional design issues. This may be due to the fact that the tryout took place within the context of the instructional planning course. As with the SMEs, there was some reluctance on the part of these respondents to limit themselves to written comments and most of their feedback came from the discussion. Their responses were considered to be relevant to the subject matter and instructional design evaluations.

Issues related to the instructional design of the program predominated. The participants initially said that they were unable to respond to any of the questionnaire items because the objective or purpose of the presentation was not clear to them. They felt it was impossible to determine if, for example, content was comprehensive since the objectives of the audiovisual presentation were neither explicit nor implicit.

In regard to content, some particularly useful perspectives were provided due to the unusual cultural mix of the group which included students from Kenya, Uganda, Brazil, India and Canada. Responding to the issue of comprehensiveness, those from developing countries felt strongly that the program focussed too much on technical causes of the world food problem and did not present the social causes. As well, they said that the program should have included more about the world food situation rather than focussing on Africa alone. They agreed that the content was important and that this kind of information should be presented to high school students.

High School Learners

The learner's perspective was provided by high school students. The results of the responses to the 21 scale items on the questionnaire are presented in Table 1. (See next page). In general, the students responded favorably to the presentation. They perceived it as being interesting, informative and well-organized.

TABLE 1
Summary of High School Learner Responses to Reactionnaire Scale Items

Question (abbreviated)	Frequency 1	2	3	4	5
Sufficient background	**44**	**81**	**13**	**25**	**3**
Sure of what learned	**52**	**75**	**28**	**8**	**3**
What learned important	**76**	**56**	19	9	**6**
Equipment distracting	15	31	**24**	**53**	**45**
Filmstrip boring	17	**37**	**25**	**52**	**37**
Well organized	29	**83**	**37**	**12**	**7**
Use professional speaker	**28**	80	40	**16**	**4**
Tape too fast	**6**	29	**26**	**56**	50
Repetitious ideas	**4**	**24**	**41**	**66**	**33**
Useless information	**8**	**13**	**33**	59	**53**
Filmstrip/tape unrelated	10	**34**	**36**	49	39
Information missing	**8**	**31**	**62**	**45**	**21**
Excellent examples	**25**	80	40	**16**	**4**
Unfamiliar vocabulary	**8**	11	**23**	**61**	**62**
Discussion would help	29	**57**	**36**	**25**	19
Learned a lot	30	**57**	**45**	**22**	**14**
Recommend changes	16	**24**	**45**	**58**	**23**
Tryout a waste of time	**5**	**26**	**38**	**46**	30
Prefer text or lecture	**5**	**6**	10	**35**	109
Like to review program	**27**	**54**	**44**	29	**14**
Program generated interest	21	**56**	**51**	**24**	**15**

Note: Frequency indicates the number of individuals who responded at each point on the five-point rating scale: 1 = strongly agree; 2 = agree; 3 = uncertain; 4 = disagree; 5 = strongly disagree. Nranged from 165 to 168.

A few responses revealed some uncertainty on the part of the learners. When asked whether they felt that any information was missing from the presentation and if they felt that the filmstrip and tape were well related, there was a great amount of variance in responses.

An open-ended question asked the learners to provide a brief explanation of the main point of the program. In reviewing the 168 reactionnaires, fifteen major categories of response emerged (Table 2 on next page). Results indicated that, in general, the learners understood the message that the presentation was attempting to convey. A large percentage (30%) felt that the main point of the program was to make viewers aware of the world food problem, and to inform them of the situation. Typical comments were, “The program was to let us know what happens in the other parts of the world and the struggle they have to eat

TABLE 2
Main Point of the Program According to High School Learner Written Comments

	Number of Responses*	%
Awareness of the world food problem	60	30
We can help - do something about it	39	20
The food problem in Africa	24	12
Change before too late for Canada	15	7
Life in Africa - Ethiopia	7	3
We waste	7	3
We're lucky	6	3
Others are suffering	6	3
Famine can happen anywhere	6	3
Importance of food	6	3
Causes of world hunger	3	2
Start caring	3	2
Issues concerning world food day	1	1
The problem of surviving in third world countries	1	1
No response	14	7
Totals	198	100

* Total is greater than Nas some learners indicated that there were one or more main points to the presentation

and live day by day" and "To make us aware of the problem of food". Another 20% felt that the main point was to inform that we can all do something to alleviate the problem, for example, "It helped us understand that there are many people dying of hunger and we should help them" and "To show that we should try to help these people, that it can be done".

Considering that the learners indicated that they wanted more discussion on the topic, would like to review the program, that the program generated their interest (Table 1, items 15, 20 and 21) and that they understood the main point of the presentation, it can be concluded that the objective of the presentation was indeed achieved.

Summary

The information resulting from reviews and tryouts with the four groups was sometimes in agreement, sometimes complementary and sometimes conflicting. Major examples of the differential information provided by the various sources are presented below.

Errors. The SMEs were the only group to focus on content inaccuracies. This supports the claim that experts should be asked to validate any materials being developed. Thiagarajan (1978) suggests that experts review materials before they are tried out with members of the

target audience so that learners are exposed to accurate content. Experts should be asked to review again after revisions have been made to ensure that content has not been distorted by by the revision process.

Up-to-datedness. The SMEs were also the only group who expressed concern that the presentation perpetuated certain myths that not only depart from current thinking in the field but are also counterproductive to current efforts towards improving the situation (e.g., hunger exists because there is not ample food). Once again, this indicates the kind of unique feedback that only a subject matter expert can provide.

Comprehensiveness. Both the SMEs and the agriculture students raised issues regarding the comprehensiveness of the presentation. Both groups felt that other causes of world hunger needed to be included, even if they were briefly presented as a context within which to explore a single cause. From the design perspective, the ID experts presented complementary information. They felt that an overview and summary were needed to clarify the context of the topics being treated in the presentation.

SMEs and agriculture students also agreed that the presentation focussed too much on Africa hence implying that the food problem was specific to that part of the world. This concern was substantiated in the learner data. At least 15% of the responses (Table 2) indicated that the main point of the program was the food problem in Africa, rather than the world food problem.

Objectives. This is an area where conflicting information was provided by different sources. The ID experts and the agriculture students felt strongly that the objectives of the presentation had to be clarified and made explicit to the learner in order for the presentation to achieve its purpose, The learner data indicates that the learners understood the objectives of the program in spite of the fact that they were vague and not explicit.

Organization. The instructional design experts and the agriculture students felt that the overall organization of the presentation was weak. They indicated that, in part, this was due to the lack of objectives which made it difficult to judge if content was related to objectives. But, as well, they felt that the internal flow of topics and relationship among topics needed to be strengthened. The ID experts felt that an advance organizer of some kind would assist with clarifying this structure. The high school learners again presented conflicting information. They said that the presentation was well organized but one might ask whether these learners have adequate skills to judge this issue.

Relationship of narration to visuals. The instructional designers and the high school learners both expressed concern about the match between the narration and the visuals. In fact the same example of mismatch was mentioned by each group. Both felt that depicting colonialism with a picture of lush vegetation tended to convey the impression that conditions under colonialism were more desirable, when in fact the message was the colonial rule was a contributing factor to food problems.

CONCLUSIONS

As external evaluators, it was not within our mandate to make revisions to the materials, although we did provide a few general recommendations for the consideration of the producers. In the end, of course, it was their decision as to what changes should be made to the materials based upon the feedback from our experts and learners, the Educational Advisory Committee and teacher tryouts done across Canada.

We did recognize, however, that decisions as to how to revise the program would probably be quite different if one had to rely upon information from experts only or learners only rather than feedback from the combined sources. For example, if solely the feedback from the SMEs was relied upon, decision-makers might be inclined to totally rewrite the script in order to include a more comprehensive picture of the causes of the world food problem and to include more on problems in areas other than Africa. If solely the information from the ID experts was relied upon, decision-makers might be inclined again, to rewrite the script in order to provide an advance organizer, a clear statement of purpose or objective, and to carefully sequence the content in order to achieve the objective. If solely the feedback from learners was relied upon, decision-makers might be unaware of the peculiarly North American perspective being conveyed by the program.

When the combined information is reviewed, rather different decisions might be made. The objective of the program was to provide a context and framework for discussion of world food issues. While this is a very broad objective, the learners apparently understood the main point of the program and as well indicated that they were interested in and wanted to have discussions on the topic. Since it could be said that the program was basically effective in achieving its goals with the learners, it might not seem imperative to invest the extra time and expense of totally revising the program to satisfy all of the concerns of the experts.

Thiagarajan (1978) provides some particularly useful suggestions as to how one might go about deciding which expert suggestions to implement. First, he cautions that "Too many experts . . . spoil the product with contradictory and counterproductive suggestions. One or two experts in each area provide an appropriate panel..." (p.136). He adds that it is not always feasible to revise based on every expert comment. One approach to assigning priority to revisions suggested by experts is to tabulate them and use those which have the highest frequency count.

Loose Ends

There are a number of loose ends in this discussion which cannot yet be tied up due to some missing links in the research.

One of the most pressing questions that remains is how does one actually make revisions based upon any kind of data, whether it be from experts, learners or a combination of the two. There are suggestions as to how data can be translated into an informed revision decision (e.g., Gropper, 1975), however most revision is still done intuitively. In fact, the situation has not improved greatly since Thiagarajan wrote in 1978, "A recent informal study confirms our experience that different developers may come up with entirely contradictory revisions (e.g., delete the paragraph versus add more explanation to the paragraph) based on the same learner feedback. We need a set of heuristics for translating learner feedback into revisions" (p. 140).

Other unresolved questions concern experts. What defines an expert and an area of competence? A brief list was provided earlier in this article but many other combinations or distinctions are possible. What are the specific contributions of experts in the process of formative evaluation? Saroyan (1987) is currently investigating these two areas and will report some initial findings at a conference early in 1987. What are the most appropriate ways to elicit feedback from experts? In this study, for example, we found that experts were somewhat reluctant to respond to a written questionnaire.

Even though unresolved issues remain, the literature does tend to indicate that revised materials are more effective than unrevised materials. Intuitive revision based on feedback from experts and learners still seems preferable to no revision at all.

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