*COMMUNITY APPLICATIONS OF
INSTRUCTIONAL TECHNOLOGY:
TRAINING WRITERS OF INSTRUCTIONAL PACKAGES¹*

STEPHEN B. FAWCETT AND R. KAY FLETCHER

UNIVERSITY OF KANSAS

A community education program, to develop a variety of performance competencies in large numbers of neighborhood residents, requires a technology for preparing learning units administerable by community members themselves. The effects of a writing manual, designed to teach nonprofessionals to prepare such instructional packages, were analyzed in two experiments. Experiment I employed a multiple-baseline design across three university student trainees. The results showed that appropriate program writing increased by 75% after completion of the manual. The results of Experiment II, with two low-income neighborhood residents serving as trainees, showed that packages produced by trained writers resulted in a greater increase in skill activities than sets of training stimuli produced by untrained writers.

DESCRIPTORS: community education, program writing, instructional packages, self-help behavior, task analysis, role playing, paraprofessional training, packaging behavioral interventions, adults

Societal critics have noted the apparent trend for community residents to look only to professionals and government agencies, rather than to themselves or each other, for advice and assistance (*e.g.*, Illich, 1976; Morris and Hess, 1975; Neighborhood Government Act of 1975). A behavioral analysis (Mager and Pipe, 1970; Skinner, 1969) of self-help and mutual assistance in communities might suggest the importance of rearranging the prevailing contingencies of reinforcement to promote self-help,

removing obstacles to mutual assistance, and designing educational systems to shape competencies in helping skills. The latter component of a comprehensive community intervention for promoting self-help and mutual assistance—the development of a community educational system—is the subject of this and a related (Mathews and Fawcett, 1977) study.

The absence of a variety of competencies, including community living and helping skills, is typical of large numbers of residents in many different low-income communities (Roth, 1976). The scope of the training problem would appear to require that a community education program, to be practical, be administerable by nonprofessionals (Caplan, 1976). A community education program deliverable by low-income neighborhood residents might allow for implementation wherever its targets gather, in church basements, storefronts, and neighborhood service centers, for example. Further, if the media used to train competencies in neighborhood residents required expensive hardware, such as videotape equipment, and were available only through large educational institutions; their use might be unnecessarily restricted. Accordingly, relatively inexpensive

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"software", such as written learning units, might be a mode suited to the budget limitations of community-based education centers.

Thus, prominent considerations in the development of a community educational system include: (a) preparing learning units designed to shape performance competencies in neighborhood residents and, (b) training peers to administer learning units to other neighborhood residents. The second consideration is examined in a related study (Mathews and Fawcett, 1977), but the systematic preparation of learning units is the focus of the present work.

The development of replicable learning units in the form of combined or "packaged" behavioral interventions is consistent with the technological character of applied behavior analysis (Baer, Wolf, and Risley, 1968). "Packaging" denotes a process whereby appropriate softwares are developed to communicate information or teach specific skills (Risley, Clark, and Cataldo, 1976). Instructional packages (*i.e.*, containing more than one procedural component) are a vehicle for systematically replicating skill-training procedures with neighborhood residents. This study reports two experiments evaluating a manual designed to teach nonprofessionals to prepare instructional packages administerable by neighborhood residents.

GENERAL METHOD

Task Analysis

The packaging of procedures to teach a specific skill was preceded by a detailed analysis of each task (Gagné, 1962; Gagné and Briggs, 1974; Resnick, Wang, and Kaplan, 1973). The task analyses employed in this study were developed by the experimenters, based on interviews with neighborhood service center staff members knowledgeable in the particular skill areas. These "experts" provided a description of what a competent person does in performing the job (Mager, 1972). Each task analysis, which was not more than two pages in length, consisted of the following information: (a) a

general description of the overall job, (b) a rationale for the overall job, (c) a description of the stimulus situation calling for the performance of the job, (d) a specification of each of the discrete activities that make up the job, and (e) rationales for each of the activities.²

Instructional Package Format

The packaging elements described elsewhere (Fawcett, Mathews, Fletcher, Morrow, and Stokes, 1976) were incorporated into a standard format consisting of eight sections: (1) a set of Instructions, (2) a Study Guide, (3) a Situational Example(s) with Hints section, (4) a Situational Example without Hints section, (5) Answer Keys, (6) a Criterion Test, (7) a Behavioral Checklist, and (8) a Target Behavior Definitions section.

Program Writing Manual

A manual, entitled *Writing Instructional Packages: A Manual for Program Writers*³, was designed to teach the reader to prepare all eight of the package sections. This manual consists of a series of structured lessons for each of the eight sections described above. Each lesson consisted of a set of, (a) Instructions, (b) a Study Guide, (c) Situational Example Quizzes and, (d) a Criterion Test. The Criterion Test required the reader to prepare a section of the package when he or she is given a new task analysis. Training is considered complete for a particular section when the reader has mastered all appropriate writing behaviors on the Criterion Test.

EXPERIMENT I

Trainees and Setting

Three male college students enrolled in a community research practicum course at the University of Kansas served as trainees. One

²Copies of the task analyses employed in this study are available from the first author.

³Copies of the 271-page *Writing instructional packages: a manual for program writers*, by S. B. Fawcett and R. K. Fletcher, are available from the first author on request for \$9 per copy.

student was a senior in journalism; another, a sophomore in general studies; the third, a junior in advertising. None of the students had experience in package writing. The setting for this experiment was a classroom. One of the experimenters was present during each session to provide and control availability of materials.

Observation

Writing behaviors were observed in response to the presentation of a series of 11 different task analyses. Table 1 shows the titles of tasks for each of the sessions. The tasks were randomly assigned to each of the 11 sessions. Each session lasted approximately 60 min. Prepared instructions ranged from one to four pages.

An observer scored all the packages written by each of the trainees. The observer did not know (nor was told) the experimental conditions under which the sets of instructions were produced. The observer was given detailed, 18-page, response definitions for the individual writing behaviors.⁴ An observer employed a checklist to score the occurrence or nonoccurrence of each of the target behaviors. Table 2 shows the target behaviors for the Instructions

⁴Copies of the detailed observational code for program writing behaviors are available.

Table 1
Task Analyses Used in Writing Sessions

Session	Task Analysis
1	How to Accept Items Donated to the Service Center
2	How to Provide Housing Assistance Referrals*
3	How to Close a Public Speaking Presentation
4	How to Fill out Meeting Attendance Forms
5	How to Provide Praise for a Good Job
6	How to Provide Emergency Medical Prescription Assistance
7	How to Accept a Compliment
8	How to Fill out the Monthly Client Report Form
9	How to Begin a Public Speaking Presentation
10	How to Handle Requests for Cash Loans*
11	How to Provide Legal Aid Referrals*

*Note—Since these services were *not* provided at Penn House the purpose of the training was to teach low-income staff members to refer the client to an agency that would be able to assist them.

section. An observer used a checklist to score the occurrence of each of the writing behaviors for all the task analyses.

Interobserver agreement was evaluated by an independent observer who used a behavioral checklist to score the permanent products of the program-writing sessions at a different time than the primary observer. At least one such check was taken in each experimental condition for all trainees for a total of six checks. Point-by-point reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements. The average percentage of agreement on the scoring of the writing behaviors was 97%.

Writing Package

A writing package was developed by the authors to teach the behaviors for the Instructions section only of the package format. The experimenter administered the package to each subject. After having completed the study guide and opportunities to practice the writing behaviors for two different tasks, the trainee was given corrective feedback and then administered a final, totally unprompted, writing situation on the Criterion Test. After having passed the Criterion Test, the trainee was considered ready to prepare the Instructions section.

Experimental Conditions

The effect of the package on the performance of the target behaviors (*i.e.*, writing the

Table 2
Program writing behaviors for Written Instructions Section.

1.	Title for the package
2.	Rationale for the overall task
3.	Special skills needed for the task
4.	When the activity should be done
5.	Examples of situations calling for performance
6.	Activity statement for each activity in task
7.	Explain how to do the activity
8.	Examples of the activity
9.	Rationale for the activity
10.	Summary introduction sentence
11.	Summary list of each activity in task

Instructions section) was analyzed by a multiple baseline across trainees. The experimental conditions were as follows:

Baseline. In each of the first three sessions, the trainees were presented with a novel task analysis. Before the first baseline session all trainees were presented with a summary sheet (similar to Table 2), which they retained during sessions for all conditions.

Writing package. When baseline was terminated after the third session, the first trainee received the manual for the Instructions section. The manual was similarly administered after the fifth session for the second trainee and after the seventh session for the third trainee.

RESULTS

Figure 1 shows the percentage of occurrence of writing behaviors for the three trainees in Experiment I. For the first trainee, introduction of the package resulted in an increase from a pretraining mean of 29% to a posttraining mean of 95%. The second and third trainees showed similar pretraining to posttraining mean increases; from 16% to 96% and 18% to 96%, respectively. No increase occurred before treatment was introduced. Thus, the percentage of specified target behaviors for the Instructions section was higher after introduction of the training stimuli than before for each of the trainees.

EXPERIMENT II

Experiment II was designed to provide an external validation (Campbell and Stanley, 1966) of the effectiveness of complete sets of training stimuli (*i.e.*, containing all eight of the package sections). This experiment involved a comparison of the effectiveness of packages produced by untrained and trained writers. The effectiveness of the prepared training stimuli was measured in terms of the behavior of low-income staff members of a neighborhood service center in simulated situations.

Fig. 1. The percentage of occurrence of writing behaviors for the written instructions section for each of the trainees in Experiment I. The vertical dotted lines indicate the point at which the writing package was introduced for each of the trainees.

Preparation of Instructional Packages

The same general procedure employed in Experiment I was followed in obtaining the sets of training stimuli used for this experiment. Two additional undergraduate university students, a female sophomore in American studies and a male junior in political science, were asked to write two packages based on two different task analyses. One of the tasks involved "How to Provide Instructional Feedback"; the other involved "How to Provide Housing Location Referrals". The writers were first provided with written general instructions (*e.g.*, write fill-in-the blank study guide questions) on preparing complete sets of training stimuli and a sample package (for a different task). Following

removal of the model, each writer was instructed to prepare a complete package. The order of the writing (*i.e.*, either "How to Provide Instructional Feedback" followed by "How to Provide Housing Location Referrals" or housing referrals followed by instructional feedback) was counterbalanced across the two writers.

After preparing a package before training, the writer was then instructed to complete the entire manual. Feedback was provided on the Criterion Tests for each section. After the final section of the manual was completed, a Review Criterion Test with a similar corrective feedback procedure was administered. After all behaviors were performed correctly in response to this novel task analysis, the writer was then instructed to prepare a posttest package. Since the packages were produced by writers both before and after instruction for preparing sets of training stimuli, some of the instructional components were either incomplete or omitted for each of the packages.

Each of the instructional packages was administered by a low-income staff member trained to administer the sets of training stimuli, but unaware of both the purpose of the research and the experimental conditions under which the packages were developed. The trainer was instructed to administer the entire package while not "making up" any parts of training that were not outlined in the written material. The administration of a package required an average time of approximately 40 min.

Trainees and Setting

Two low-income neighborhood residents, both staff members of Penn House, a neighborhood service center, served as the trainees. The first trainee, a 41-yr-old white woman, had obtained her high-school diploma and worked at Penn House as a trainee in the federal W.I.N. program. The second trainee, a 42-yr-old white woman, had also completed high school and had been a volunteer at Penn House for the previous 3 yr. Neither of the trainees had any formal training for either how to provide in-

structional feedback or how to provide referrals for housing.

The setting for this experiment was a classroom at Penn House. A low-income community proctor, who administered each of the packages, and a person playing the part of a client were also present for each evaluation session.

Definition of the Behavior

Two different packages—"How to Provide Instructional Feedback" and "How to Provide Housing Location Referrals"—were administered separately. Each of the sets of training stimuli were designed to teach a number of defined behaviors.⁵

Scripted Role-Playing Evaluation Sessions

Scripted role-playing evaluation sessions (Fawcett *et al.*, 1976; Fawcett, Miller, and Braukmann, 1977) served as the observational framework for this experiment. The "script", which was prepared by the experimenters and remained constant for each package for all sessions, consisted of a number of verbal statements serving as probes for the particular set of activities. For example, the scripted line, "I'm looking for a house and I was wondering if you could help", served as the probe for the behavior associated with providing housing location referrals. A session began with the scripted verbal statement by the person who had been trained to play the role of the client.

Observation

Each of the service activity target behaviors was listed on separate checklists for each of the two tasks. The response definitions employed by the observers were developed before the experiment on the basis of the task analyses (*i.e.*, not on the basis of the packages produced by the writers). An independent observer scored the occurrence or nonoccurrence of each of the behaviors from audiotapes.

⁵Copies of the response definitions for the two instructional packages employed in Experiment II are available.

Reliability checks were taken by an independent observer who scored tapes of both observations for each of the tasks. Interobserver agreement was measured by an item-by-item comparison of the scoring of the occurrence or nonoccurrence of individual target behaviors for each task. Reliability was calculated by dividing the total number of agreements times 100 by the number of agreements plus disagreements. The average percentage of agreement was 100% for instructional feedback behaviors and 100% for housing referral behaviors.

Experimental Conditions

The comparative effectiveness of packages produced by untrained and trained writers was analyzed by a simple pretest-posttest design counterbalanced to control for order and task difficulty.

Pretest. The pretraining performance of two low-income neighborhood residents was observed in simulated situations for each of the two service tasks.

Training. Training consisted of administering a package for the respective task. Each trainee was administered a set of training stimuli produced by an untrained writer for one task; one produced by a trained writer for the other.

Posttest. The posttraining performance of the trainees was also observed for each of the tasks.

RESULTS

Interobserver Agreement

Interobserver agreement was computed for the observations of writing behaviors in Experiment II. The overall mean percentage of agreement for both writers for all elements was 97%.

Data

For the first writer, introduction of the manual resulted in an increase from a pretraining overall mean of 5% for all writing behaviors to a posttraining mean of 89%. For the second writer, introduction of the manual resulted in a similar increase from a pretraining overall

Fig. 2. The overall mean percentage of trainee behaviors for the community service tasks for both low-income neighborhood resident trainees in Experiment II. The left-hand pair of bars represents trainee performance on packages produced by untrained writers. The right-hand pair of bars represents trainee performance on sets of training stimuli produced by trained writers. The solid bars represent the mean percentage of trainee behaviors for both trainees before introduction of the package. The hatched bars represent the mean percentage of trainee behaviors for both trainees after introduction of the set of training stimuli.

mean of 7% for all behaviors to a posttraining mean of 82%. The percentage of writing behaviors increased for all package elements after the complete manual was introduced.

Figure 2 shows the mean percentage of trainee behaviors performed on packages produced by both untrained and trained writers. For both low-income staff members combined, introduction of training stimuli produced by untrained writers resulted in an increase from a pretraining mean of 9% of the possible correct behaviors (range from 0% to 18%) to a posttraining mean of 32% (range from 0% to 64%). The introduction of packages produced by trained writers resulted in an increase from a pretraining mean of 19% (range from 9% to 29%) to a posttraining mean of 84% (range from 82% to 85%). For both writers, the package produced after writing training was

more effective than the corresponding set of training stimuli produced before training. Thus, packages produced by trained writers were more effective than those by untrained writers.

The undergraduate trainees required a mean total time of 20.1 hr to complete the entire writing manual. The mean amount of administrator time (requiring the presence of the administrator to provide feedback on the programmed situational examples) was 1.6 hr.

DISCUSSION

The combined results from both experiments suggest that the writing manual was effective in teaching nonprofessionals to prepare learning units effective in shaping target behaviors in neighborhood residents. The package format described in the manual and employed in training low-income neighborhood residents consisted of (a) a set of instructions, (b) a study guide, (c) programmed situational examples, and (d) behavior rehearsal plus feedback. The relative importance of each of these elements in affecting trainee skill performance was not analyzed in this study. However, the findings of related research with low-income paraprofessionals (Mathews and Fawcett, 1977) showed written instructions alone to produce only moderate increases in behavior for some categories and no increases for other categories. Anecdotal evidence suggests that the type and length of the task, as well as trainee population, may affect the number of required instructional elements. For short, nonsocial interaction tasks involving college undergraduate trainees, written instructions may be an adequate training stimulus. For longer tasks involving social interaction and low-income neighborhood residents, additional instructional elements may be necessary. While the inexpensiveness of administering the entire set of training stimuli (*i.e.*, 40 min per package) somewhat reduces the necessity of a component analysis, the examination of the relative importance of the individual instructional elements merits additional

research. In addition, an administrative procedure allowing for the trainee to "test out of" a skill unit before receiving any of the instructional elements would presumably reduce the cost of training (McMichael, Brock, and DeLong, 1976).

A variety of other training procedures, including verbal instructional programs (*e.g.*, Briscoe, Hoffman, and Bailey, 1975), programmed competency-based learning units (*e.g.*, McMichael, Brock, and DeLong, 1976), and workshops (*e.g.*, Braukmann, Fixsen, Kirigin, Phillips, Phillips, and Wolf, 1975), have been shown to be effective in training skills. While many of these approaches employ similar elements (*i.e.*, written or verbal instructions, situational examples, behavior rehearsal and feedback), the formats and delivery requirements vary. An analysis of the relative costs and benefits of different skill-training approaches for a variety of instructional problems and trainee populations represents a most important area for future investigation.

Shaping a variety of performance competencies, including self-help and mutual assistance skills, in large numbers of neighborhood residents in many different low-income communities would appear to require a community education system suitable for application in low-income neighborhoods. The targeting of broad community educational goals, the analysis of performance competencies desired of community members, the development of instructional objectives, and the preparation of learning units administerable by neighborhood residents (the subject of this study), suggests a model for developing a community education curriculum. However, a number of additional questions, including whether neighborhood residents could be trained to administer the learning units (Mathews and Fawcett, 1977) and whether residents could be motivated to participate in such a program, await answers before the described procedures could be incorporated into an overall community education delivery system.

It would appear that the achievement of broad community goals, such as increased self-help and mutual assistance, can be realized only by comprehensive community interventions; sometimes combining the instructions, consequences, and systematic removal of obstacles necessary to achieve the objectives. In this context, perhaps some combination of incentives for self-help (e.g., Miller and Miller, 1970), neighborhood service centers as mediators of mutual assistance (e.g., Katz, 1970; Perlman and Jones, 1969), and instruction in helping skills (Danish and Brock, 1974; Fawcett *et al.*, 1976) might prove effective in improving levels of local problem-solving in low-income communities. As such, systematic procedures for preparing learning units may offer a technological base with which more comprehensive community intervention programs may be built.

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