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ABSTRACT
                 This handbook provides suggestions about quality
control procedures that will enable Teacher Corps project personnel
to assess the effects and success of educational products, practices,
and other outputs prior to dissemination. Two assessment processes
are outlined. The first, review, is the collegial ongoing process for
Teacher Corps project personnel to assess the effects and potential
impact of innovations before dissemination. The second, validation,
is the formal post-development process for Teacher Corps projects to
assess the evidence of effectiveness for approval by an official
panel. Guidelines and checklists for reviewing innovative products
and practices are provided. The criteria used for validating an
educational program are presented along with descriptions of the
responsibilities of project personnel in the validating process. A
format for submitting materials to a dissemination review panel is
included as well as a description of panel criteria used for judging
program effectiveness. (JD)

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January, 1981

Handbook for Review and Validation of Teacher Corps Products and Practices

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HANDBOOK FOR REVIEW AND VALIDATION

OF

TEACHER CORPS

PRODUCTS AND PRACTICES

January, 1981

FAR WEST LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

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Full Text Provided by ERIC

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FOREWARD

Educators who consider adopting elements of the school improvement and educational professional development programs of Teacher Corps projects may reasonably expect evidence that a specific product, practice, or process really *works*. Teacher Corps project personnel will have to provide adopters with plausible information about their innovations that demonstrates both the credibility of supporting evidence and the educational significance of each product or practice.

Current Teacher Corps regulations require projects to develop specific objectives to achieve the adoption or adaptation of processes, practices, and products found useful in project schools to:

° Persons involved in the project;

° Schools of the local educational agency and components of the institution of higher education which are not involved in the project;

° Other local educational agencies, institutions of higher education, and communities; and

° Others interested in educational policy.

Toward this end, the staff of the Teacher Corps Dissemination Project has worked to identify quality control criteria for Teacher Corps projects to use in assessing the program elements that they choose to share with others.

This handbook represents a great deal of collaborative interaction by the contractor's staff and Teacher Corps project personnel, regional network staff, the Research Adaptation Cluster, the national program office, and specialists in educational assessment. The handbook, and the materials provided for projects in the Teacher Corps Dissemination Tool Kit, contain effective procedures and practical advise for project personnel striving to stimulate the adoption and adaptation of their innovations.

Teacher Corps projects are developing a number of exciting educational innovations for children in schools serving low income families. We want you to extend the benefits of these programs to schools throughout the country. This handbook should prove useful to you in assessing the educational significance and effectiveness of the products and practices that you share with others.

Director, Teacher Corps

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At a time when there are literally thousands of innovative educational
products and practices to choose among, the task of sorting through all of
the possible alternatives is a formidable one indeed. The developers of
innovations have to be ready to respond to the questions of potential
adopters, including the following:

"Yeah, but, how   "Yeah, but, how   "Yeah, but, how
do you know it   do you know it   do I know that
really worked?"   will work here?"   those kids are
                                                        like ours?"

Teacher Corps project personnel, as do all developers of innovative
programs, have an obligation to be prepared to respond to these and to
similar questions. It is necessary to collect data on the effects of an
educational innovation, to document carefully its development, adaptation,
and institutionalization in order to be able to respond in professionally
adequate ways to potential adopters.

This handbook provides Teacher Corps project personnel with general guidelines for assessing educational products and practices. It may be used in the preparation of detailed procedures for assuring the quality of project-developed innovations locally prior to dissemination to other educators. In short, the handbook should make it more likely that Teacher Corps project personnel will be better able to respond to those "yeah, but . . ." questions as they disseminate their proven products and practices.

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INTRODUCTION

Background

Since it began operations in 1966, the Teacher Corps of the U.S.
Department of Education has been a major influence in teacher education in
the United States. Over the years, many innovative programs have emerged
as Teacher Corps projects sought to carry out program mandates to strengthen
educational opportunities available to children from low-income families,
to stimulate development of teacher preparation programs for teachers of
children from low-income families, and to encourage institutions of higher
education and local educational agencies to improve programs of training
and retraining for teachers and teacher aides.

The 1976 amendments to the Higher Education Act of 1965 reflect the
intent of Congress to increase (1) attention projects will give to improving
the school/learning climate, and (2) emphasis on reforming the training
and retraining of educational personnel, and to provide (3) greater focus
on demonstration, documentation, institutionalization, and dissemination
of the outcomes of Teacher Corps projects.

The current Rules and Regulations of Teacher Corps assign to projects
the responsibility for taking steps to ensure the adoption or adaptation by
other educational agencies and institutions of the products, practices, and
processes that projects may develop. Teacher Corps project personnel are
expected to develop objectives for stimulating adoption and adaptation of

their products and practices by demonstrating and disseminating them to:

1. Persons involved in the project;

2. Schools of the local educational agency and components of the
    institution of higher education not involved in the project;

3. Other local educational agencies, institutions of higher
    education, and communities; and

4. Others interested in educational policy.

It is to these outcomes and objectives that the Teacher Corps Dissemination

Project addressed its attention. The project had two principal objectives:

1. To assist Teacher Corps in establishing an effective system
    for sharing information about products, practices, and other
    outputs within Teacher Corps, among projects and project
    personnel.

2. To design and pilot-test a process for validating and
    disseminating Teacher Corps products, practices, and other
    outputs to educational institutions and agencies throughout
    the country.

Dissemination: Broadly Conceived

In this handbook, dissemination is considered as a set of more or less discrete activities within the larger context of planned change in educational institutions. Within this context the "roles" of developer, documenter, evaluator, demonstrator, and so forth may seem to overlap with the activities of the disseminator. But in reality all are elements of an institutional configuration that enables individuals, who have personal commitment to school improvement, to extend and deepen the impact of their efforts. The planned change model, seen in the context of a Teacher Corps project, includes all the outreach activities that eventually lead to the adoption or adaptation of project-developed innovations--products, processes, and practices--by other educational agencies and institutions.

Thus, dissemination <u>cannot</u> be regarded as a separate task to be under-
taken in the third or fourth year of a Teacher Corps project; it is an integral
part of the process of planned change. Dissemination should be regarded as
a two-way process--where the spread and exchange of information about educa-
tional innovations can facilitate choice among alternatives and contribute to
effective implementation--that can assist Teacher Corps projects extend the
impact of their programs beyond their local sites. When viewed as an integral
part of school improvement and educational personnel development efforts,
dissemination emerges very early and continues throughout the life of a project:

° During the needs assessment phase project personnel identify
  "targets" for improvement; this process also identifies the
  potential "audiences" for outreach efforts.

° Preparing project objectives involves the delineation of
  baseline conditions that will serve to measure change and
  for making claims about program effectiveness.

° A project's evaluation design provides parameters for defining levels
  of educational and experimental "significance", measures that
  provide data for establishing the plausibility of project effects.

° Implementing a school improvement or educational personnel
  development program (which may utilize resources or materials that
  have been identified through educational dissemination systems)
  provides documentation that can be used to assess program cost
  effectiveness, estimates of "transportability", and data of program
  effects on students and educational personnel.

° Institutionalization of project-developed innovations is, in
  effect, an outcome of dissemination efforts at the local level.

° Outreach is the natural extension of the planned-change process.
  Although in its early stages outreach may not involve a great
  deal of face-to-face contact with potential clients, it requires
  the same kinds of personal interaction and perseverence to help
  adopters adapt project-developed products or practices that are
  needed for local institutionalization.

This handbook will help Teacher Corps project personnel assess the effects
of project-developed products, processes, and practices so that they will be
able to provide adopters with plausible evidence of the effectiveness of the
innovations.

QUALITY CONTROL AND EDUCATIONAL INNOVATION
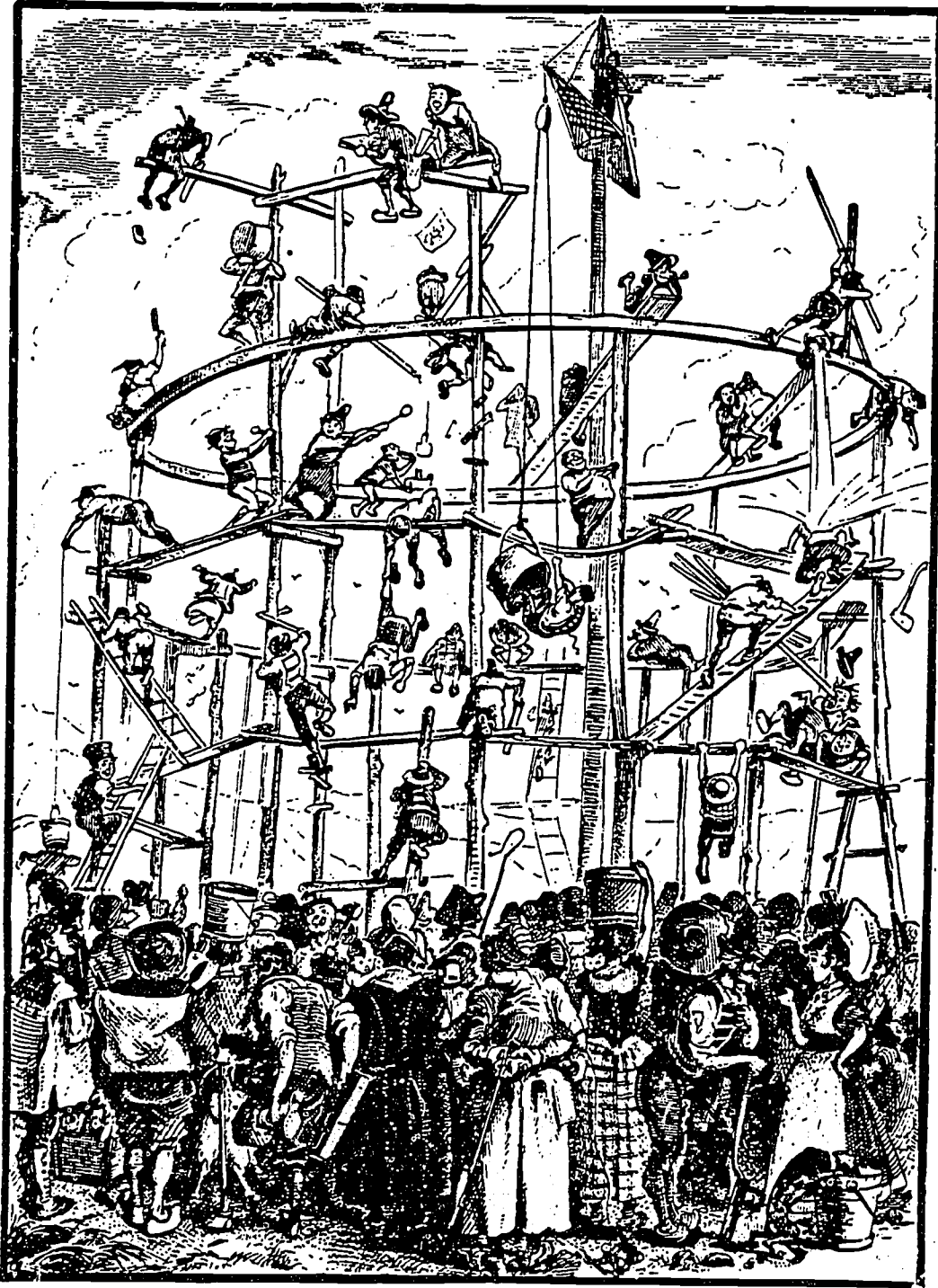
Promising, Successful, or Exemplary?

The purpose of dissemination is to share information about successful educational programs. Problems arise, however, when we try to define what we mean by "successful." The evaluation of educational outcomes can range from an intuitive sense that "something happened" to very sophisticated measures of change that involve statistical analyses and rigorous research procedures. This handbook provides suggestions about quality control procedures that will enable Teacher Corps project personnel to assess the effects--the success--of educational products, practices, and other outputs prior to dissemination. Two assessment processes are outlined in the handbook:

- ° Review is the collegial on-going process for Teacher Corps project personnel to assess the effects and potential impact of innovations before dissemination among other Teacher Corps projects and other educational audiences (pages 11 to 33).

- ° Validation is the formal post-development process for Teacher Corps projects to assess the evidence of effectiveness for review by the Department of Education's Joint Dissemination Review Panel (JDRP) or state Identification, Validation, Dissemination (IVD) panels (pages 35 to 49).

Each process will require local or regional adaptation when it is implemented. The handbook suggests procedures and criteria which have general applicability for assessing educational innovations. In order to meet the particular requirements of each project, however, it will be necessary for Teacher Corps project personnel to develop specific procedures (forms, documentation requirements, etc.) to accomplish each of the processes.

In general, the processes have the following distinctions:

	Review	Validation
WHO?	Project personnel (others as appropriate)	Project personnel and evaluation consultant(s)
WHAT?	Innovations being developed or already implemented locally	Innovations found effective in project school or college sites
WHERE?	Local project LEA and IHE sites	At local project sites; then forwarded for review by Teacher Corps Program office or state IVD panel
WHEN?	Continuously	Whenever required
HOW?	As part of an ongoing evaluation; in preparation for disseminating to other Teacher Corps projects or other educational audiences	As the formal process of prescreening innovations before submitting to the JDRP or state IVP panels
WHY?	To collect evidence of the effectiveness of project-developed products and practices to share with potential adopters.	

NIE Product Review Criteria

The criteria suggested for use in the project review process have been adapted from those developed by the Dissemination and Resources Group of the National Institute of Education (NIE). These criteria, synthesized from the research literature on the evaluation, assessment, review, and selection processes for educational products and practices (EPIE Institute, 1978), are described in Appendix A, pages 51 to 58, and are incorporated in the checklist suggested for use in reviewing innovations developed by Teacher Corps projects (pages 16 to 33).

The JDRP and State IVD Processes

In the U.S. Department of Education the JDRP is charged with applying
quality standards for products and practices--criteria relating to educa-
tional significance and credibility of supporting evidence--in the review
of claims made for educational innovations. Excerpts from the JDRP Ideabook
(Tallmadge, 1977) about JDRP criteria are included in the handbook section
on validation. States variously make use of IVD panels or other review
and certification procedures to identify effective products and practices.

The JDRP meets periodically in Washington to review submissions from
Department of Education program offices (such as Teacher Corps Washington).

> . . .which are responsible for identifying potentially exemplary
> projects and for carrying out a pre-review screening for factual
> accuracy, social fairness, and possible harm to users, as well
> as for evidence of effectiveness. Only those submissions that
> are approved by the JDRP may be in any way endorsed by the
> Education Division or disseminated as exemplary using Federal
> Education Division funds. (Tallmadge, 1977)

The process outlined for project validation in this handbook will aid Teacher
Corps projects make JDRP or state IVD submissions.

It is not anticipated that all Teacher Corps products and practices
will undergo JDRP or IVD review. Many of the products and practices developed
by Teacher Corps projects will be better suited to other dissemination systems.
Products that include copyrighted material, for example, cannot be reproduced
for further distribution without the permission of the copyright holder. We
have outlined the process of project review in this handbook to enable Teacher
Corps projects and networks to get promising products and practices, and/or
information about them, into the many channels for dissemination that exist
in addition to the JDRP/NDN system (see Guidelines for Dissemination of
Teacher Corps Products and Practices).

Exemplary Products

The point to remember here is contained in the phrase "disseminated as exemplary using Federal . . . funds." A project <u>can</u> use its funds to disseminate products and practices to other LEAs <u>and</u> IHEs--and provide information about the effectiveness of the innovations at the local site--as long as project personnel do not state or imply that the products or practices are "exemplary" or are "endorsed" by the Department of Education. That indication of official approval is reserved to the JDRP.

Some of the important terms and concepts used in the handbook are defined on the following page. The next two sections of the handbook outline the procedures and criteria for reviewing and validating Teacher Corps products and practices. The processes are distinct in terms of the persons who serve in particular roles and in the emphasis on assessing practical outcomes and empirical evaluation data.

Educators who use this handbook need to be aware of the definitions of several terms from the field of dissemination as they are used herein. The JDRP Ideabook provides the following definitions:

Educational Innovation	A broad concept which includes products, processes, practices, programs, and other outcomes.
Educational Products	"Products" and "materials" refer to transportable, tangible or packaged programs or practices such as curriculum materials, educational management systems, computer programs, staff training material, guides, models, administrative procedures and Project Information Packages (PIPs).
Educational Practices	"Practices" and "methods" refer to systematic programs, procedures, or techniques whose adoption or adaptation requires assistance from the originators or their representatives.

This handbook also makes use of the more precise perspective on educational materials defined by Emrick and Peterson (1978):

Materials: brochures, manuals, workbooks, handbooks, filmstrips, videotapes, and other hard-copy or mediated presentations of information. Three different types of materials are used in dissemination/utilization efforts:

Descriptive materials: printed matter, visual displays, and other hard-copy information designed to communicate what the new knowledge, product, or practice is, how it can be used, and what benefits will accrue from use.

Instructional materials: the textbooks, workbooks, audiovisual sequences, and other items which make up the basic curriculum or content of the educational process (curriculum materials that are not central to the innovation are classified as support materials).

Support materials: printed matter, audiovisual aids, and other informational components that occupy a background or optional status; support materials include elements of an innovation's curriculum, management, and implementation that are neither central to the innovation nor essential to its utilization.

GUIDELINES FOR PROJECT REVIEW

OF INNOVATIVE PRODUCTS AND PRACTICES

Local Quality Control

The guidelines that follow provide _suggestions_ for procedures and criteria for reviewing Teacher Corps products and practices. The process that is outlined here is very general; each project will have to determine the specific documentation requirements and the nature of the evaluation processes for assessing the quality of products and practices that are selected for outreach. The criteria for reviewing educational products may be applied (1) according to rigorous standards of empirical precision, (2) according to informal judgmental estimates of product effects, or (3) anywhere along a continuum between the two. Decisions about the rigor of standards for reviewing educational innovations will have to be made in light of the situation existing in the local project site:

- What resources for assisting in program evaluation are available to the project?

- How valid and reliable are the existing product or practice evaluation data?

- What kinds of evaluation data are considered important by potential adopters?

- How much evidence of effectiveness is necessary to persuade potential adopters to pay attention to the innovation?

- What are the opportunity costs of investing in the kind of evaluation that will yield credible evidence about product effects?

```
Informal                                    Precise
Judgment                                    Empirical
of Product                                  Evidence of
Effects                                     Effectiveness

|   |    |   |    |   |    |   |    |

     Continuum of Standards for Assessing Educational Products
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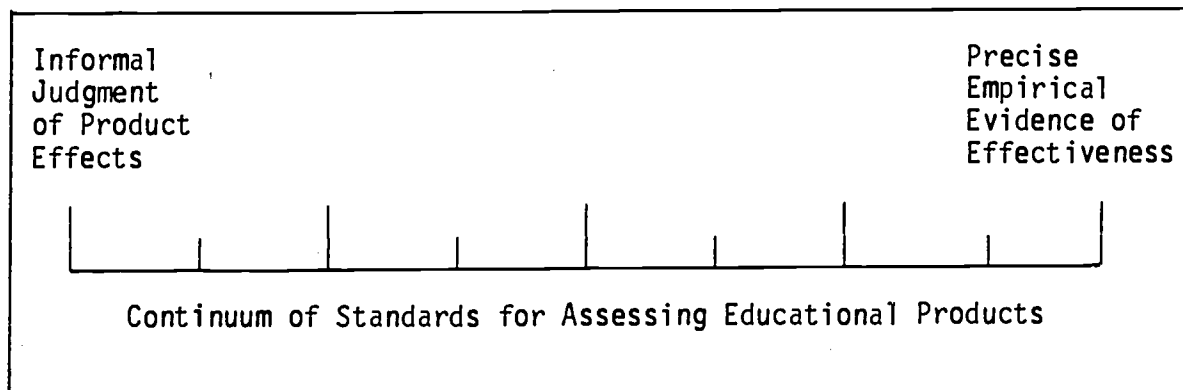
The standards employed in reviewing an innovation may be aimed toward establishing claims of product effectiveness that could be submitted to the JDRP. This, as noted already, is the objective of the _validation_ process and is described in detail in the next section. The emphasis on empirical evidence of change that is typically accepted by the JDRP need not, however, be viewed as a limiting factor in decisions related to evaluation design.

The outcome of careful, systematic product review--using this set of criteria and rating forms--may be evidence of product effectiveness that meets the standards for JDRP approval, _but it need not be._ The credibility of the evaluation of a Teacher Corps product or practice can be established without large amounts of empirical data. The effectiveness of some educational practices and processes cannot be established by conventional experimental procedures, data collection, or statistical analyses.

One approach to organizing project personnel for the review of project-developed products or practices is outlined below.

Project Review

A. The Roles

The Applicant - The individual (or individuals) of a project who prepare the documentation for the review process for consideration by the Project Review Committee.

The Project Review Committee - A group of three to five persons (including the project director and representing the LEA and IHE project staff and the Community Council) who review products and practices prior to dissemination to other Teacher Corps projects and/or other educational audiences.

B. The Process

A Local Teacher Corps project will establish a Project Review Committee to assess:

° The potential of products or practices (either under development or after implementation locally) for institutionalization and for use by other Teacher Corps projects, and/or

° The suitability of products or practices for dissemination to educational agencies outside Teacher Corps.

The following materials may also be helpful in conducting project reviews and, as well, project validations:

ED Materials/Support Center, National Diffusion Network. Far West Laboratory for Educational Research and Development, San Francisco, CA:

*Guide to Packaging Your Educational Program, 1980.

*Guide to Producing Print Materials, 1979.

Educational Resources Information Center (ERIC), National Institute of Education, U.S. Department of Education, Washington, DC, 1979:

*How to Use ERIC.

*Submitting Documents to ERIC.

Emrick, John A., with Peterson, Susan M. A Synthesis of Findings Across Five Recent Studies in Educational Dissemination and Change (Revised Version). Far West Laboratory for Educational Research and Development, San Francisco, CA, June 1978.

EPIE Institute. Criteria for Reviewing Educational Products. Product I, NIE Products on Instructional Materials Selection (DHEW). ERIC Clearinghouse on Information Resources, Syracuse University, Syracuse, NY, 1978.

Teacher Corps Dissemination Project, Far West Laboratory for Educational Research and Development, San Francisco, CA, 1980:

Guidelines for Dissemination of Teacher Corps Products and Practices.

*Manual for the Development of Educational Materials.

Teacher Corps Dissemination Checklist.

Teacher Corps Dissemination Sources.

Teacher Corps Dissemination Tool Kit (includes publications listed here that are marked with an asterisk [*]).

Technical Assist nce Base of the National Diffusion Network. Capla Associates, Inc., Rochelle Park, NJ:

*Developer/Demonstrator Task Analysis.

*Getting It All Together: The JDRP Process.

E. Product Rating Form

This form was designed to facilitate the review of the quality of
educational products for decisions related to continued product   ´
development, additional product evaluation, product dissemination
or product utilization. The form is not designed to review technical
plans for carrying out any of the above activities. This form has
been developed to indicate dimensions of apparent quality of products
even when highly credible evidence is not available to confirm these
ratings.

DIRECTIONS

Sources of Information

In determining your ratings, please consider all available evidence
including the product itself (as well as samples of the product in use),
qualitative or quantitative evidence provided by the producers (developers
or publishers), judgmental or empirical information from other sources
and information derived from your experiences and knowledge of the
field. Feel free to contact developers, users, or others to secure
additional information or to verify or clarify existing information.

Ratings on Major Criteria

After reviewing the relevant evidence on the prime and comparative
products and determining the credibility of this evidence, circle the
number 0 to 4 which reflects your best judgment of the value of the
product on the relevant criteria dimensions. As indicated by the
Product Review Form, the major criteria include: Desirability, Intrinsic
Quality, Cost/Adoptability, and Effectiveness. These criteria dimensions
are further subdivided to obtain more precise ratings . . . . On the
ratings of each type of evidence, ·please star (*) the considerations
which primarily contributed to your judgments. Also, wherever possible,
try to keep your ratings on the different criteria dimensions distinct
so that the dimensions will assess unique factors. For example, the
rating on the "desirability" of the product should not be altered by
its rating on "cost" or "effectiveness."

Overall ratings for each major criteria dimension and for the total
product quality should reflect the average of the sub-ratings unless
there is a defensible rationale for rating otherwise--such as a plan to
weight the contributing criteria differently.

CRITERIA WEIGHTING FOR THE PRODUCT RATING FORM

Teacher Corps Review Commitees may use the Product Rating Form to assess the merit of completed products. <u>PLEASE ASSIGN PERCENTAGE VALUE POINTS TO EACH OF THE CRITERIA.</u> Sum these criteria for each major grouping such as Desirability, Intrinsic Quality, Cost and Adoptability, Effectiveness and Other. (Please use whole numbers 1-100.) Assume that the evidence to rate the criteria is available and credible.

☐ A. Desirability

    _____ 1. Need

    _____ 2. Marketability and Demand

☐ B. Intrinsic Quality

    _____ 1. Social Fairness

        _____ a. sex

        _____ b. race

        _____ c. religion

        _____ d. socio-economic

    _____ 2. Content Accuracy

    _____ 3. Technical Quality of Communication

    _____ 4. Instructional Quality

    _____ 5. Product Appeal

    _____ 6. Uniqueness

    _____ 7. Adequacy of Product Development

☐ C. Costs and Adoptability

    _____ 1. Costs

        _____ a. Reasonableness

        _____ b. Compared to Common Alternatives

        _____ c. Compared to Critical Competitors

_____ 2. Adoptability

        _____ a. Acceptability

        _____ b. Exportability

        _____ c. Flexibility

        _____ d. Ease of Use, Manageability

[ ] D. Effectiveness

    _____ 1. Type and Comprehensiveness

    _____ 2. Potency (size, significance, duration)

    _____ 3. Extent of Initial Target and Non-Target Groups Effected

    _____ 4. Cumulative Nature of Effects on Non-Initial Users

        _____ a. Snowball effect

        _____ b. Impact effects

    _____ 5. Interactive Effects

    _____ 6. Efficiency

[ ] E. Other Important Criteria (please specify)

100% Total Points Possible

When used with developing Teacher Corps products or practices reviewers are encouraged to revise their ratings as new or more credible evidence emerges during the development and evaluation phases.

Bear in mind, however, that the instrument was designed for use by reviewers other than the developers and that the "closeness" of project personnel to an innovation will affect their objectivity.

Credibility of the Information

The ratings on the criteria dimensions should be influenced by the credibility of the evidence reviewed. If some of the sources of evidence or types of information have low credibility (0-1 ratings), do not base your judgments on this low credibility evidence. At the minimum, it is hoped that you will attribute at least passable credibility to your own analysis and judgments and thus be able to rate all the relevant dimensions requested in this Product Rating Form even if credible information from other empirical or judgmental sources is lacking.

To help in later group discussions of the ratings and in feedback to the producers, please indicate by a check (√ or √√) which source of evidence most influenced your judgment. Then rate the credibility of all sources on a scale from 4 (high) to 0 (low).

Scale values associated with credibility or believability of the evidence include:

4 -- <u>Excellent Credibility</u> -- Complete confidence in the evidence because: the quality and appropriateness of evaluative measures and evaluation procedures are impeccable; the information is objective and generalizable on many relevant dimensions; and the effects referenced are supported by adequate evidence of causality. (These considerations are described in more detail in the chart on Credibility Dimensions Associated with Each Level of Evidence Presented.)

3 -- <u>Good Credibility</u> -- Moderate confidence in the evidence because: the measures and evaluation procedures are appropriate and of sufficiently high quality; there is no reason to question the objectivity of the information, there is some indication of causality where an effect is claimed; and information on generalizability is limited.

2 -- <u>Passable Credibility</u> -- Minimum confidence in the evidence because: although there may be better approaches, the measures and evaluation procedures are acceptable; while the data may be subjective, there is no conflicting information to question its validity; generalizability is limited; and evidence related to causality is weak.

1 -- <u>Doubtful Credibility</u> -- Partial confidence in major portions of the evidence because: the measures and evaluation procedures are not completely acceptable; the information is more subjective than objective; the generalizability is severely limited; and there is little or no evidenc. of causality.

0 -- <u>Negligible or No Credibility</u> -- No confidence in major portions of the evidence because: the measures and evidence procedures are unacceptable; the information is subjective; the generalizability is severely limited; and there is no adequate evidence of causality.

A. DESIRABILITY: NEED AND MARKETABILITY
---

1. <u>Need</u>

Assuming that this product is as ideal as it is described to be, use the following considerations in rating the need for the product in its given domain:

° Social and educational significance of the problem (existing state in education and desired end state)

   --Size of population directly and indirectly affected by the problem

   --Intensity of the problem (demand for a solution)

   --Priority of the problem (importance to the decision maker-funding source)

° Relevance of product to general problem: Extent to which the product including side effect dimensions responds positively to the problem

   --Scope and centrality of the product to the need

   --Appropriateness or timeliness of the product for the need. Is there a need or a desirable want that is not already served?

   --Size of population which is likely to be served by the product or appropriate and options including potential multiplicative or impact effects on secondary targets or beneficiaries.

```
Negligible                                          Extremely important
   need                                                     need
    0 ——————1——————— 2 ——————— 3 ——————— 4
```

Indicate High (4) to Low (0) on credibility of the information on which you based your judgment:

___ rationale of need provided by producer, ___ other judgmental information, ___ empirical information provided by producer, ___ other empirical information.

2. <u>Marketability and Demand</u>

Assuming that this product is as ideal as it is described to be, use the following considerations to rate the potential marketability or demand for the product:

° Availability of other products to meet the need

° Likelihood that product would be used if available (market study--for mass or thin market, publisher commitments)

Probable Negligible   Likely Strong Demand
Demand for the Product   for Product
    0 _____ 1 _____ 2 _____ 3 _____ 4

Indicate High (4) to Low (0) on the credibility of the information on which you based your judgment:

___ information provided by producers, ___ other judgmental information, ___ other empirical information.

<u>Overall Rating on the Desirability of this Product Assuming that it is as Ideal as it is Described to be.</u> (consider above two (2) ratings)

            Negligible   Extremely
            desirability   desirable
                0 _____ 1 _____ 2 _____ 3 _____ 4

Please discuss your reasons, frame of reference, weighting for different types of evidence, etc.

B. INTRINSIC QUALITIES (Items dealing with the essential nature or constitution of the product)

---

1. <u>Social Fairness</u> - extent to which the product excludes and counters bias related to sex, race, religious beliefs, ethnicity and socio-economic status

a.   Affirmative Action appears
                                                    to counter bias related to
   Contains obvious bias   sex by appropriate corrective
      related to sex   measures
            0 _____ 1 _____ 2 _____ 3 _____ 4

b.

Contains obvious bias
related to race and
ethnicity

Affirmative Action appears
to counter bias related to
race and ethnicity by appro-
priate corrective measures

0————————1———— 2 ————3 ——————————4

c.

Contains obvious bias
related to religious
beliefs

Affirmative Action appears
to counter bias related to
religious beliefs by appro-
priate corrective measures

0————————1———— 2 ———— 3 ——————————4

d.

Contains obvious bias
related to socio-eco-
nomic status

Affirmative Action appears
to counter bias related to
socio-economic status by
appropriate corrective
measures

0————————1———— 2————3 ——————————4

Indicate High (4) to Low (0) on the credibility of the information or
analysis on which the social fairness judgments are based.

___ producer information, ___ others' analysis of the product,
___ your analysis of the product

2. Content Accuracy and Validity - extent to which this product is accurate
and appropriately complete; for learner
level and up-to-date with current knowledge

Contains serious flaws
or inadequacies

Content is accurate and
appropriately complete
for learner level

0————————1———— 2———— 3 ——————————4

Indicate High (4) to Low (0) on the credibility of the information
or analyses on which these content accuracy and validity judgments
are based:

___ producer information, ___ others' analysis of the product.
___ your analysis of the product

3. <u>Technical Quality</u> - extent to which audio and/or visual materials are
   <u>of Communication</u>   presented, edited, synthesized, etc. to communicate
                       clearly and appropriately

Hampers communi-   Greatly facilitates
cation of content   communication of
                                                    content
    0—————————1————— 2 —————3 —————————4

Indicate High (4) to Low (0) on the credibility of the information
or analyses on which this technical quality is assessed:

___ producer information, ___ others' analyses of the product,
___ your analysis of the product

4. <u>Instructional Quality</u> - extent to which instructional strategies are
                        appropriate for target groups

Consider:

   ° wise use of learning strategies, motivational techniques
   ° correct reading level
   ° inclusion of evaluation components as appropriate
   ° appropriate sequencing and pacing

Apparent   Highly appropriate
serious   strategies known to
flaws   work with similar users
    0—————————1————— 2 ————— 3 —————————4

Indicate High (4) to Low (0) on the credibility of the information
or analysis on which this instructional quality is based:

___ producer information, ___ others' analysis of the product,
___ your analysis of the product

5. <u>Product Appeal</u> - extent to which product might appear artistic, creative,
                   pleasing or satisfying to potential purchasers or users

Product might appear
unappealing, blah,
preachy or condescending,   Product would appear
disagreeable or unsatis-   to have great appeal
factory to majority of   and satisfaction for
target users   potential target users
    0—————————1—————2————— 3 —————————4

Indicate High (4) to Low (0) on the credibility of the information
or analysis on which this assessment of product appeal is based:

___ producer judgmental and empirical information, ___ other judgments of the product, ___ other empirical assessments of the product, ___ your judgment of the product.

6. Uniqueness or Innovativeness of Product in terms of: combinations of intrinsic quality and other dimensions and methodological advances (models, etc., for improving education in other substantive areas).

Commonplace, no   Highly unique model
different from   for a new type of
normal practice   product
    0——————————1————————2————————3—————————————4

Indicate High (4) to Low (0) on the credibility of the information or analysis on which this assessment of product uniqueness is based:

___ producer judgment and/or empirical evidence, ___ other judgments of the product, ___ other empirical assessments of the product, ___ your judgment of the product.

7. Adequacy of the Product Development Process - extent to which the product is "well made." Consider the use of early task analysis, clear statements of purpose and objectives, appropriate relationships between tasks, appropriate formative evaluation and revision

No information to
suggest that the   Product seems to
product was "well   have been carefully
made"   developed
    0——————————1————————2————————3—————————————4

Indicate High (4) to Low (0) on the credibility of the information on which this assessment of the adequacy of the product development process is based.

___ producer supplied background information, ___ other background information, ___ your or others' assessment of the product itself.

Overall Rating on Intrinsic Quality

Low Intrinsic   High Intrinsic
Quality   Quality
    0——————————1————————2————————3—————————————4

Please discuss your reasons, weightings for different dimensions, etc.

```
┌─────────────────────────────────┐
│ C.  COSTS AND ADOPTABILITY       │
└─────────────────────────────────┘
```

1. **Costs**

   Consider:

   ° materials, equipment, etc., provided for learners (distinguish between optional and required)

   ° materials, equipment, etc., provided for teachers and other personnel (e.g., orientation and pre- and inservice training materials and procedures, including description of the responsibilities of different individuals who contribute to the product's use). (Distinguish between optional and required.)

   ° personnel costs required for product adoption (number and types of personnel required, level of special training required, availability of special training, costs of training and/or consultants, and other necessary support services.

   ° total product installation and continuation costs per user, school, or equivalent unit.

   ° cost per individual student or target recipient in terms of dollars and average hours of use required.

   a. Reasonableness of costs in dollars or dollar equivalent (see above considerations) for initial installation and continued use in terms of anticipated outcomes and economic reach of potential purchasers or users.

   Excessively high   Low costs
   costs for poten-   for potential
   tial purchasers   purchasers
        0─────────────1──────── 2 ─────── 3 ─────────────4

   b. Comparative rating of costs in relation to the costs for common alternatives.*

   Excessively high   Low costs com-
   costs compared to   pared to common
   common alternatives   alternatives
        0─────────────1──────── 2 ─────── 3 ─────────────4

   ─────────────────────────────

   *Common alternatives are usual practices such as teacher lectures which are designed to achieve similar purposes. Critical competitors are exportable products designed to achieve similar purposes.

c. Comparative rating of costs in relation to critically competitive* products, if any exist.

Excessively high
costs compared to   Low costs com-
costs for critical   pared to critical
competitors   competitors
0 —————————— 1 ——————— 2 ———————— 3 ——————————— 4

Indicate High (4) to Low (0) on the credibility of the information on which you based your judgments:

___ cost information provided by the producer, ___ externally supplied or verified cost data, ___ external cost estimates.

2. Adoptability

a. Acceptability to purchasers and users

Consider:

° lack of opposition by target users or beneficiaries, by purchasers or others involved with the product

° legality of use, conforming to appropriate copyright provisions, state laws, etc.

Extensive user or   Highly acceptable
purchaser opposition   to users or
to product   purchasers
0 —————————— 1 ——————— 2 ———————— 3 ——————————— 4

Indicate High (4) to Low (0) on the credibility of the information on which you based your judgments:

___ information provided by the producer, ___ other judgmental information, ___ other empirical information

---

*Common alternatives are usual practices such as teacher lectures which are designed to achieve similar purposes. Critical competitors are exportable products designed to achieve similar purposes.

b. Exportability

Consider:

- º is the product sufficiently complete to be used outside
  of the developmental sites? (i.e., on a "stand alone"
  basis without developers present)

- º are the product and its supporting materials amenable
  to adequate dissemination?

- º if auxiliary services such as teacher training, equipment
  maintenance, or external testing services are needed, to
  what extent are they likely to be available in user sites?

Very difficult to   Easy to use out-
use outside the   side the develop-
development setting   ment setting
       0——————1——————2——————3——————4

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgments:

___ information provided by producer, ___ other judgmental
information, ___ other empirical information.

c. Flexibility - to what extent can the product be easily changed
                  or adapted to local needs or used to fit multiple
                  needs and constraints?

Product Adaption   Product Adaption
not recommended or   recommended and
quite difficult   quite easy
       0——————1——————2——————3——————4

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgments:

___ information provided by the producer, ___ other judgmental
___ information, ___ other empirical information.

d. Ease of Use: Manageability

Consider:

- º consumer readiness: degree to which product can
  be used under pre-existing user constraints

- º extent of resource requirements (equipment, personnel,
  space) not normally available in schools

° extent of organizational changes needed in scheduling, organizing personnel, revising management systems, etc., to fit with existing components of the educational system

° ease of consumer maintenance, product durability (or ease of updating products), usefulness of auxiliary materials (teacher guides, evaluation procedures) quality control mechanisms

Not easily managed   Easy to operate,
with common existing   use with common
resources   existing resources
    0 ——————1————2————3——————4

Indicate High (4) to Low (0) on the credibility of the information on which you based your judgments:

___ information provided by the producer, ___ other judgmental information, ___ other empirical information.

Overall Rating on Cost and Adoptability

High cost, difficult   Low cost, easy to
to adopt or adapt   adopt or adapt
    0 ——————1————2————3——————4

```
D.  EXTRINSIC EFFECTS--EFFECTIVENESS
```

1. Type and Comprehensiveness of Learner Effects on Appropriate Target Population

    Consider number of positively affected key variables which are related to:

    ° learner knowledge, attitude, or awareness changes (as indicated by paper and pencil assessments or the equivalent)

    ° learner performance or skill changes (behavioral indicators such as application tests, simulations, or "real life" observations over short and long term periods).

Few trivial types of
positive learner
effects

Many important types
of positive learner
effects

0 ——————— 1 ——— 2 ——— 3 ——————— 4

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgment:

___ empirical evidence provided by the producer, ___ judgmental
evidence provided by others (own), ___ straight empirical evidence
provided by others, ___ comparative empirical evidence.

  (Evidence supporting the credibility issue of causality
  would have to be examined carefully. Performance
  changes would probably be weighted more highly than
  cognitive changes.)

2. Potency of the Effects

Consider:

  ° size and significance of the change resulting from the
     product on the prime target group

  ° duration of the effect

       (The credibility of measures and evaluation
        procedures would have to be examined carefully).

Small, insignificant
short-term effects

Extensive, signi-
ficant long-term
effects

0 ——————— 1 ——— 2 ——— 3 ——————— 4

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgment:

___ empirical evidence provided by the producer, ___ judgmental
evidence provided by others, ___ straignt empirical evidence
provided by others, ___ comparative empirical evidence.

  (Evidence supporting the credibility issue of causality
  would have to be examined carefully. Performance
  changes would probably be we' hted more highly than
  cognitive changes.)

3. <u>Extent of Initial Target and Non-Target Groups Affected Positively</u>

Consider:

* extent of positive effects (minus negative effects) on
  the target group (intended recipients to solve educa-
  tional problem)

* extent of positive effects minus negative effects on the
  non-target group (unintended recipients)

Positive effects on a limited segment of the target group and on few non-target group members	Positive effects on total target group and many non-target group users
0————1———— 2———— 3 ————4	

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgment:

___ empirical evidence provided by the producer, ___ judgmental
evidence provided by others, ___ straight empirical evidence
provided by others, ___ comparative empirical evidence.

(The credibility issue related to the extent of generali-
zability to target and non-target populations should be
examined carefully. Positive effects on target groups
would probably be weighted higher than positive effects
on non-target groups.)

4. <u>Cumulative Nature of the Effects on Others</u> (not the original users)

Consider:

a. Multiplicative or "snowball" effects (e.g., original
   users will be able to train other users to do the same
   thing)

Negligible "snowball" effects	Extensive "snowball" effects
0 ————— 1 ————— 2 ————— 3 ————— 4	

b. Impact effects (e.g., original users such as teachers will
   learn to behave in ways that have positive results on their
   students)

Negligible positive impact effects on individuals who are original users	Extensive positive impact effects on individuals who are original users
0————————1————— 2—————— 3 —————————4	

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgment:

___ empirical evidence provided by the producer, ___ judgmental
evidence provided by others, ___ straight empirical evidence
provided by others, ___ comparative empirical evidence. ·

> (Evidence supporting the credibility issue of causality
> would have to be examined carefully. Performance changes
> would probably be weighted more highly than cognitive
> changes.)

5. Interactive Effects of the Product (treatment) with other products
    (treatments) under conditions, or user characteristics.
    Do the effects on the original users become stronger or
    weaker when used with other treatments or after specified
    pre-requisite treatments? Many interactive effects may
    be labeled as positive or negative "side effects."

Negative interactive   Positive interactive
effects of the product   effects of the product
and other products or   and other products or
user conditions or   user conditions or
characteristics   characteristics
         0 ———————— 1———— 2 ———— 3 ————————— 4

Indicate High (4) to Low (0) on the credibility of the information
on which you based your judgment:

___ empirical evidence provided by the producer, ___ judgmental
evidence provided by others, ___ straight empirical evidence
provided by others, ___ comparative empirical evidence

> (Credibility issues related to generalizability and
> external validity should be examined carefully.)

6. Efficiency in Achieving the Effects

Consider:

    ° amount of learner time required to attain effects

    ° amount of other (non-dollar) resources required to attain
       effects (e.g., numbers of instructional personnel required)

Negligible efficiency   Extensive efficiency
in achieving effects   in achieving effects
         0 ———————— 1———— 2 ———— 3 ————————— 4

Indicate High (4) to Low (0) on the credibility of the information on which you based your judgment:

___empirical evidence provided by the producer, ___ judgmental evidence provided by others, ___ straight empirical evidence by others, ___ comparative empirical evidence.

> (Evidence supporting the credibility issue of causality would have to be examined carefully. Performance changes would probably be weighted more highly than cognitive changes.)

Overall Rating on Effectiveness of Product

Negligible positive   Extensive positive
effects   effects
0————————1————2————3——————4
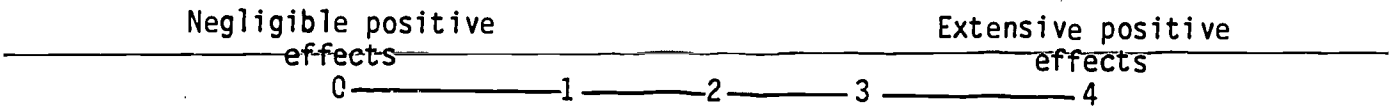
Please discuss your reasons, weightings for different dimensions, etc.

┌───┐
│ OVERALL RATING ON TOTAL PRODUCT QUALITY   │
└───┘

Inferior   Excellent
quality   quality
0———————————1——————2————3———————4
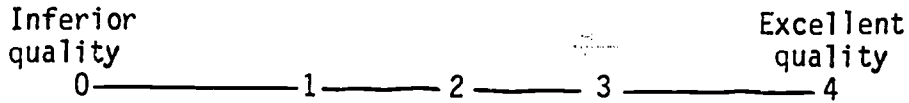
Differential weightings of the major types of evidence should be explained.

GUIDELINES FOR PROJECT VALIDATION

OF INNOVATIVE PRODUCTS AND PRACTICES

External Quality Standards

The following guidelines <u>suggest</u> procedures for Teacher Corps project validation of educational products and practices for submission to the Joint Dissemination Review Panel (JDRP). Similar procedures are prescribed for many state IVD processes. Each project will decide on the specific processes for validation, including administrative procedures, allocation of project funds, documentation requirements, and criteria in addition to those of the JDRP or the state IVD review.

Though projects may decide on more or less rigorous requirements for preliminary screening of innovations, the investigation of claims of effectiveness will focus on the submission materials required for review by the JDRP (as outlined on pages 41 to 48 of this handbook).

Project Validation

A. The Roles

<u>The Applicant</u> - The director of the Teacher Corps project applying for validation of a project-developed innovation.

<u>Investigator or Investigation Team</u> - Two options are available:

° The Advocate or Advocate Team - A Teacher Corps project director (possibly teamed with one other resource person selected by the applicant) who may be designated to conduct the investigation of the product or practice.

° The Validation Agent - An expert (not associated with Teacher Corps) who may conduct the investigation of the claims of effectiveness for the innovation.

<u>Validation Committee</u> - A committee of three to five members, representing project directors, deans, and the LEAs and IHEs of other projects in the state or region.* The committee will be responsible for reviewing the recommendations to the Teacher Corps program office. It may also provide subcommittees to investigate project innovations.

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*Obviously, this may not be feasible for projects located in some areas of the country. A committee of experienced educators could be formed with members from other components of the IHE and LEA.

The Teacher Corps Washington Dissemination Unit - The person
designated by the program office to submit the transmittal
memorandum and each submission that has completed the
Teacher Corps project validation process to the Joint
Dissemination Review Panel.

B.   The Process

Advance Information Sharing - Local projects will prepare a
brief prospectus for each product or practice they believe has
potential for validation. These may be shared with nearby Teacher
Corps projects in advance of the preparation of formal validation
documents. A prospectus on an innovation may draw upon data
accumulated during the local project review. Participants in each
of these sharing situations can identify products and processes that
appear to have sufficient evidence of effectiveness to warrant an
application for validation. Each developer will be free to prepare
formal application materials for JDRP review of the innovation.

Initiation - The applicant will prepare a draft version of the
Form for Submitting Materials to the Joint Dissemination Review
Panel for review by the Validation Committee. The applicant will
distribute copies to each member of the committee and, after a
reasonable period (10-15 days), will poll the committee to
determine if there is sufficient consensus among the members
to continue the validation process.

Validation Committee Action - The members of the committee will:
(a) consider the application and recommend that it receive
continuing validation action or (b) recommend that the application
be rejected. If a majority of the committee rejects the initial
request or causes the process to stop at any point short of
successful completion, the committee chairperson will send a
letter to the applicant giving reasons for such action. The
applicant may respond in writing to each member of the committee
within two weeks. The committee members will then reconsider
their decisions and the chairperson will notify the applicant
in writing of the committee's decision. If the committee accepts
the request, the applicant will be advised to schedule an
investigation.

Procedural Options for Investigation - Teacher Corps projects may
choose from the following alternatives in establishing the formal
process for investigating the claims of effectiveness for project-
developed innovations:

    ° Advocate (or Advocate Team) investigation by a Teacher
       Corps project director or other qualified person selected
       by the Validation Committee.

    ° Validation Agent investigation by a specialist in educa-
       tional evaluation selected by the Validation Committee.

° Validation Committee investigation by a subcommittee
  selected from the Validation Committee.

° Combinations of the three preceding options may also
  be selected to expedite the validation process.

The Investigation - Whichever of the three processes (or
combinations of processes) for assessing project innovations
is selected, a site visit provides an excellent oppportunity
to determine objectively the accuracy of the claims of
effectiveness made by the applicant. During a two-day visit
the investigator (or investigation team) may include one day
of pertinent interviews, review of evaluation data, and any
other activity which might serve to familiarize the team
with the innovation. The second day of the visit would allow
for completion of data gathering, analysis, preparation of a
report, and opportunity to discuss the investigator's
recommendations to the committee with the applicant. A letter
report of the investigation should be sent to members of the
Validation Committee within two weeks of the visit with one of
the following recommendations:

° The Validation Committee should take no further action
  on the validation of the innovation; the investigator
  does not support validation of the innovation.

° The Validation Committee should take no further action
  until such time that the applicant brings evidence to
  the committee that specified developmental activities
  (for example, an additional field test) have been
  carried out in regard to the product or practice. At
  such a time, the investigator would support validation
  of the innovation.

° The Validation Committee should support validation
  of the innovation.

In the event that the applicant and the investigator cannot
reach mutual agreement on recommendations to the committee, the
applicant may file an appeal to the committee within two weeks
of the original investigation requesting a second investigation.

Validation Committee Action - The investigator will send copies of
the report to each member of the Validation Committee and to the
applicant, and schedule a meeting (or conference call if that is more
practical) of the committee. The committee will hear any final
arguments for or against validation from the applicant and/or the
investigator. The Validation Committee will make its recommendations
on validation using normal decision making rules. In cases of
approval, the Validation Committee will direct the applicant to
submit the validation documents to the Teacher Corps Washington
Dissemination Unit for program review prior to submission to the JDRP.

C. Guidelines

The applicant will be allowed to withdraw an innovation from consideration at any point in the validation process.

The applicant will be responsible for preparing all descriptive material in regard to the innovative product or practice.

The selection of an advocate or advocate team by the Validation Committee may take into account the following factors:

°   Preferences of the applicant, especially for a
    resource person to serve with a project director.

°   Equitable distribution of the advocacy workload
    among the other project directors.

°   The individual director's desire to serve as
    advocate for a given validation effort.

°   Background or experience in the technical areas
    which are related to the innovation to be vali-
    dated.

If no director is willing to serve as an advocate for a given validation request, the Validation Committee will select an impartial investigation group from its own members or other available sources.

The selection of the Validation Agent by the Validation Committee may involve consideration of the following factors:

°   Qualifications in the technical areas related to
    the innovation to be validated. Acceptable evidence
    might be publications, research, reports, and/or
    recommendations of persons in responsible educational
    positions.

°   Availability in terms of scheduling and fees that
    are not beyond project budget limitations.

°   Whether or not the agent has had any involvement in
    the development of the innovation to be validated.

°   Whether or not the agent is an employee of the in-
    stitution of higher education or local educational
    agency which sponsors the applicant's Teacher Corps
    project.

The selection of the Validation Committee may be done as follows:

° Project directors will share with nearby projects
  the name(s) and background(s) of project directors,
  deans, and other project staff personnel of the
  SEAs and LEAs with expertise and interest in
  serving on validation committees.

° Applicants will consult the roster of candidates
  (and accompanying background data) and invite in-
  dividuals to serve on a Validation Committee to
  review particular products or practices.

The validation documents submitted to the Teacher Corps Washington
Dissemination Unit will include the completed form for submitting
materials to JDRP, and may include the Investigation Report and
other documentation of the Validation Committee.

D. Resources for Validation

The appendices contain information that may be useful in conducting
a project validation:

Topic	Handbook Section	Pages
Criteria	Appendix A. Operational Definitions of NIE Criteria	51-58
Format	Appendix C. Specimen JDRP Submission	65-75

The JDRP and IVP process are described in detail in the following:

Tallmadge, G. Kasten. The Joint Dissemination Review Panel Ideabook.
    U. S. Department of Health, Education and Welfare: Office of
    Education and the National Institute of Education, October 1977.
    Available from ERIC, ED 148 329, or from the Superintendent of
    Documents, Government Printing Office (GPO), Washington, DC 20202,
    Stock #017-080-01824-1; $3.00 prepaid).

Hinze, William. Sharing Educational Success: A Handbook for Validation
    of Educational Practices. (Revised Edition, GPO 861 549). (Copies
    may be requested from Dr. William H. Hinze, National Diffusion
    Network, Room 631, Transpoint Building, Washington, DC 20202).

The documentation of a Teacher Corps project's experience with the JDRP is in:

Nagel, Thomas. A Teacher Corps Case Study: The National Validation of
    SIGMA. Teacher Corps Developmental Training Activities, University
    Nebraska at Omaha, 1980.

See also the list of publications on page 15 (above) for additional materials.

E.   JDRP Format

FORMAT AND INSTRUCTIONS FOR SUBMITTING MATERIALS*
TO THE JOINT DISSEMINATION REVIEW PANEL

The outline on the following pages displays the format
that should be used for submitting materials to the Joint
Dissemination Review Panel. Under each major heading are
specifications for the kinds of information that should be
included.

In order to be convincing, the evaluation need not be
a strict experimental design, although this type of evidence
is desirable. However, there should be some kind of high-
quality, objective, methodologically sound, quantitative
evidence demonstrating that the intervention in question was
effective and superior to other, more commonly used methods or
approaches, and that the observed effects were caused by the
intervention.

The total length of each submission, including all de-
scriptive material, tables, etc., should not exceed ten pages.
Ten pages is a maximum; less lengthy presentations are definitely
acceptable and encouraged. The evidence needs to be convincing,
not necessarily lengthy. Some of the strongest arguments are
brief, concise, and to the point.

While brevity is a virtue, the materials should include all
the information the panel will need to make its decision. All
submissions should follow the format by using the headings shown,
and should cover all the points mentioned in the instructions
under each heading. The points under each heading should be pre-
sented in the order most convenient and logical for the intervention
being documented, not necessarily in the same order as in these
instructions.

_____

* Ideabook, Tallmadge, 1977.

FORMAT FOR SUBMITTING MATERIALS
TO THE JOINT DISSEMINATION REVIEW PANEL

PROGRAM AREA: (e.g., Title III, reading, career education,
    environmental education, education for the handicapped)

I.   INTERVENTION TITLE, LOCATION:

Specify the title of the intervention and the
location for which evidence of effectiveness is
being submitted.

II.   DEVELOPED BY:

Indicate who developed the intervention originally,
even if this happened at a different site than the
one for which evidence of effectiveness is being
presented.

III.   SOURCE AND LEVEL OF FUNDING:

List all funding sources for the intervention at the
location for which evidence of effectiveness is pre-
sented and, for each source, list the amount of funds
(see Figure 1 for an example).

IV.   YEARS OF INTERVENTION DEVELOPMENT:

Indicate the year or years during which the inter-
vention was originally developed or tested.

V.   BRIEF DESCRIPTION OF INTERVENTION:

Briefly describe the intervention for which claims
of effectiveness are being made. The description
should cover at least the following points:

What is the intervention?
What are its objectives?
What claims of effectiveness are being made?
What is the context in which it operates?
Who are the intended users and beneficiaries?
What are the characteristics of the groups on which
    the intervention was developed and tested?
What are the salient features of the intervention?
What are the costs for adoption and maintenance of
    the intervention?

VI.   EVIDENCE OF EFFECTIVENESS:

Describe the evidence of effectiveness for the inter-
vention. This section should deal with each of the
following points, although not necessarily in the same
order:

Interpretability of measures: Evidence that the
quantitative measures are reliable and valid indi-
cators of the effects claimed.

Credibility of evidence: Who collected and analyzed
the data, what assurances are there that the findings
are objective?

Evidence of impact: What is the evidence that some-
thing happened? What are the effects claimed for the
intervention?

Evidence of statistical reliability of the effects:
What is the evidence that the effects happened often
enough and with sufficient reliability to be likely
to happen again under similar circumstances?

Evidence that the effects are educationally meaningful:
What is the evidence that the effects are large enough,
powerful enough, or important enough to be educationally
meaningful, regardless of their statistical significance?

Evidence that the effects are attributable to the inter-
vention: Can alternative explanations such as practice
effects, maturation, selection of superior treatment
groups, etc., be ruled out?

Evidence of generalizability to the populations for which
the product or practice is intended: Evidence that the
product or practice has been tested widely enough and
under sufficiently diverse circumstances to give assurance
that the effects claimed may be similar when the product
or practice is used elsewhere for the populations intended.

Source and Level of Funding of Intervention		
	INSTALLATION (Non-recurring Costs	SUBSEQUENT YEARS (Recurring Costs)
Personnel		
Personnel Training		
Equipment & Materials		
Consumables		
Other Costs* - Specify:		
_____		
_____		
_____		
TOTAL		
* E.g., transportation, technical assistance, public relations, etc.		

Figure 1.   An illustration of a table shell for
            showing costs.

JDRP Criteria for Judging Effectiveness

The Joint Dissemination Review Panel has received requests for
a statement of the "cutting points" on the criteria used in
reviewing projects. The Panel has been unwilling to set forth
precise specifications. The decision as to whether the evidence
of effectiveness on any particular product or practice justifies
use of Federal funds to promote dissemination is not automatic
or mechanical. This decision involves judgment about the educa-
tional signifcance of the claimed effect and the credibility of
the evidence supporting the claimed results. A decision that
the evidence is not convincing is usually not due to a single
fatal flaw, but to a failure of plausibility on several criteria.

The Panel believes that setting up highly specific standards
relating to educational significance (e.g., the importance,
number, magnitude, durability, and consistency of positive
effects and their comparative advantage) and credibility of the
supporting evidence (e.g., objectivity, reliability, validity,
generalizability and causal nature of the data) would degrade
rather than improve the review process. The Panel has felt, for
example, that it would be irresponsible to assert that projects
achieving a gain of 1.0 grade equivalent units should be accepted
while a gain of 0.9 grade equivalent units should be rejected; or
that a sample size of, say, 50 is acceptable, whereas a sample
size of 49 is not.

It is because a complex judgment on plausibility is required--one
that takes into account all of the evidence--that the Joint
Dissemination Review Panel is needed. Past experience indicates
that leaving the judgment of what is acceptable up to each Educa-
tion Division program produces variable and questionable results.
On the other hand, developing a manual of boiler-plate standards
would entail the arbitrariness cited above.

Some Guidance

All this may be true, but acknowledging it may not provide the
guidance which Education Division program staffs need in order
to identify products or practices which have a high likelihood
of being approved.

The purpose of this section is to set forth in a general way,
but in greater detail than is furnished in the Form for Submitting
Materials in the Joint Dissemination Review Panel, the kinds of
criteria the Panel uses in assessing the effectiveness of the
products or practices submitted to it. This should provide program
staffs with better guidance for selecting potential exemplary
materials and methods, and for preparing submissions to the Panel.

Many of the products and practices submitted to the Panel
have been in the area of compensatory education, environmental
education, reading, mathematics, bilingual education, and other
similar areas of cognitive achievement or affective gain in
individual elementary and secondary students. The criteria
discussed below as illustrative relate mainly to these kinds of
submission.

Perhaps the best way of making clear the kinds of criteria the
Panel uses in reaching its judgments on effectiveness is to
set forth a series of general, common-sense questions. The
questions focus on three issues: (1) Is there evidence that
anything important happened that is consistent with the stated
claims? (2) Is there evidence that what happened is generali-
zable? and (3) Can this credibly be attributed to the product
or practice?

1. How well did the learners perform before they were subject
   to the product or practice in question, and how well did
   they perform after experiencing it? As an example, are
   there measures taken before and after the learners experi-
   enced the innovation which show that they gained or improved?

2. Are the gains statistically reliable?

3. If there is evidence of change or improvement, is the gain
   large enough to be meaningful? That is, is it large enough
   to be both statistically reliable and educationally signi-
   ficant? Many submissions show apparent before-after mean
   changes in the expected direction, but they are either not
   statistically reliable or, even if statistically reliable,
   are too small in size to constitute meaningful educational
   improvement judged against commonly available experience.

4. Is there evidence that the improvements registered by the
   product or practice are stable and generalizable to other
   school settings? Or does it appear that they may be the
   result of special characteristics of the particular group
   of students who happened to use the product or practice when
   it was evaluated, or the unusual competence of the teacher
   who used it? These considerations are acute when the
   number of learners is small or where there is only a single
   use of the product, i.e., where the evidence is based on
   one teacher and one classroom. Thus, it is desirable, when
   the number of cases is small, for there to have been multiple
   replications of the practice (e.g., different classrooms,
   different teachers, different schools, or different years).

5. Once it has been established that there have been gains, that they are large enough to be statistically and educationally meaningful, and that they are generalizable beyond the originating site, the central question remains: Can we be reasonably confident that the gains can be attributed to the innovation described in the normal maturation, to the regular education process, or to other special factors which may be affecting the students? In order to provide some kind of answer to this crucially important question, submissions to the Panel should include some measure or estimate of what would have happened to the students if they had not been using the product or practice. One of the best ways to do this usually, is through a control group, but the Panel has approved many projects which did not include a control group because the evidence of effectiveness contained some other persuasive measure or estimate of the effects on non-treatment. For example, comparisons of recent gains with previous year's scores or national norms often provide persuasive evidence that unusually large gains recorded can reasonably be attributed to the product or practice. Another example is time series comparisons against a baseline time period. In many cases, however, simple before-after data on the user groups are likely to be ambiguous when there are no parallel data on a comparable, untreated control group.

The idea is to provide evidence ruling out rival hypotheses (factors which may be responsible for producing the effects attributed to the product or practice). Examples of rival hypotheses are:

* maturation--psychological or physiological changes in the users.

* history--events or administrative procedures which occurred in addition to the product or practice.

* selection/differential attrition--when comparison groups are unequal on the relevant measures at the beginning (due to selection) or at the end (due to differential attrition).

* statistical regression--e.g., when groups which are selected for their initial extreme scores on a given measure fall closer to their population mean score on retesting with the same measure.

* test effects--increases in test scores due to the learning that results from frequent use of the same test, or to teaching to the test.

These are the main criteria by which the Panel tries to
assess the evidence of effectiveness presented for products
or practices. It is not possible to specify the precise point
on any of these criteria which categorically differentiates
acceptable from un-acceptable submissions. Using all these
criteria and examining all the evidence,the Panel tries to render
judgments which, on one hand, will screen out those submissions
whose evidence of effectiveness is not strong enough to support
a federally funded dissemination effort, and on the other, will
insure that those products and practices where there is such
evidence, get moved into a wider process of dissemination which
ultimately can improve education.

Other Kinds of Outcomes

It was noted above that these illustrations apply most appropri-
ately to innovations directed at improving the achievement of
elementary school and secondary school children. The illustrations
discussed above would in many cases be quite inappropriate. The
Education Division carries out a much wider variety of educational
activities. Some activities seek to change attitudes or impart
information. Others are aimed at bringing about changes in insti-
tutional procedures, at persuading state and local governments
to adopt certain techniques, or at altering the ways in which state
or local monies are spent. Still others seek to expand the pool
of competent educational practitioners through innovations in
inservice or inservice training.

In all these cases, quite different outcome measures and evidence
of effectiveness will be required. However, the same general logic
implicit in the questions liste above apply to these products and
practices as well: Is there persuasive, objective evidence that
things are different after using the product or practice than they
were before? And can we be reasonably confident that any such
changes or improvements noted can be attributed to the effects of
the innovation described rather than to something else?

Prereview Concerns

JDRP's primary responsibility is to judge the effectiveness of
submitted products or practices. But prereviews before presenta-
tions to the Panel also serve as an additional opportunity to
assure that other screening criteria which are the responsibili-
ties of the Education Division's programs are met. As discussed
in the first two sections of this paper, the Panel is concerned
that the products or practices whose effectiveness is to be
reviewed are clearly identified, that common implementation
problems are described, and that full start-up and operating
costs are presented so that schools interested in selecting the
innovation will do so without misunderstanding its costs. Other
federal concerns include social fairness and possible harm to
users. All of these must prereviewed by program offices.

Many other concerns for "good" products have been suggested.
These include the conceptual soundness of the product or
practice, the quality of the developmental process, acceptance
by educators, the uniqueness of the submissions, how profes-
sional the materials look, and enthusiasm of parents and
students.

The Panel regards these considerations as important. Program
offices are encouraged to prereview project submissions to
the Panel on all such criteria. Nonetheless, the Panel's sole
function is to review only one category of criteria that may
be considered before dissemination: evidence of effectiveness.
This may be considered a fairly large task by itself. Adopters
should recognize, however, that JDRP only decides whether
persuasive evidence of effectiveness consistent with the claims
and goals has been presented. The product does not have a
"universal seal of approval" from the federal government: this
is not the Panel's function.

APPENDIX A

OPERATIONAL DEFINITIONS OF NIE CRITERIA

FOR REVIEWING EDUCATIONAL PRODUCTS
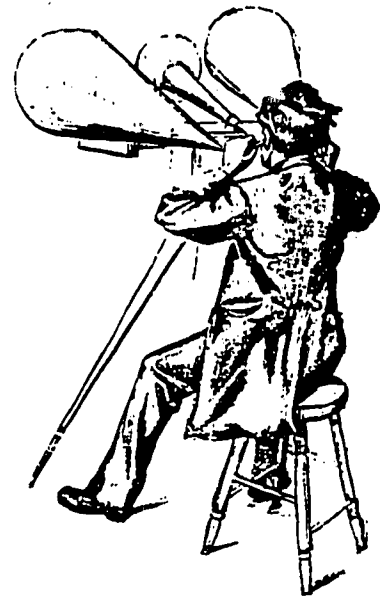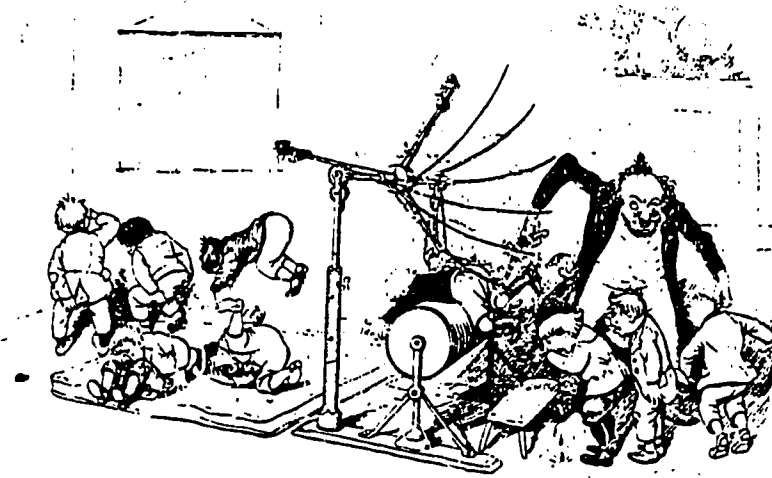
Operational Definitions of Criteria*

The term "criteria" has been used in the study to denote the standards, guides, rules and issues of concern of decision-makers used in the process of reviewing and selecting instructional products. Operational definitions of criteria should identify the connotations of the term criteria, i.e., the parameters, usages and functions. It should be possible to determine what is and is not included in a criterion on the basis of its operational definition, and thus, to make a decision as to whether that criterion is or is not met by the product.

The constraints noted in a previous section of the chapter were intended to preclude the possibility of operationally defining criteria in such a way as to ensure their general acceptability. The criteria can be defined only as they are used in the product review instrument of this study.

Desirability

Need

Schermer (1975, p. 4) defines "need" for a product as ". . . the social and educational significance of the . . . product, the size of the target group, and the priorities of the reviewing agency." This definition is applicable in the present study.

Demand

Demand will mean that there is evidence that the product was developed as a result of consumer-identified (as opposed to sponsor/developer-identified) need and request. In reviewing the product, the scope and universality of the product should be considered.

Demand will also mean that the product has high marketability as evidenced by the dissemination and diffusion of the product. Consumers are willing to purchase the product.

Appropriateness to Users

Appropriateness for the user is the degree to which the product meets the needs of learners/users in terms of the product's instructional intent, its match with the age, grade and ability level of the target group, how well it integrates with the on-going instructional program, and the extent of its compatibility with the general educational objectives of the local setting.

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* Clark, Carolyn. Report on a Codification and Analysis of Assurances, Claims and Evidence to Support Claims in NIE Sponsored Educational Products, 1975. U.S. Department of Health, Education and Welfare: National Institute of Education, October, 1976.

Appropriateness to Community

Appropriateness for the community is the degree to which the product is compatible with the instructional, social, moral and spiritual values of the local community. Issues such as citizenship, patriotism, respect for the free enterprise system, respect for authority, etc., may be considered among these values.

In the desirability cluster, two of the criteria--need for the product and appropriateness to users--seem essential and may outweigh issues related to appropriateness to the community if, should controversy arise, it can be shown that need and user appropriateness are met by the product better than anything else available on the market. Demand, as defined here, is least essential and can only be valued in conjunction with at least one other criterion.

Practicality

Cost

Cost of the product must be judged on the basis of available resources of the decision-maker, the relationship between cost and effectiveness of the product, and the advantages of the product when compared with similar other products. Costs are interrelated with other criteria such as training, availability, durability and replicability of the product. Costs depend also upon per student use.

Ease of Use

Ease of use is evaluated in terms of the clarity and specificity of tasks associated with implementation of the product for teachers and learners; the interrelationship of the product with other learning and instructional tasks and programs; and the satisfaction realized by users of the product under normal instructional conditions.

Training Requirements

Consideration of the training requirements of the product should include the cost in personnel time and availability, the relationship of the need for training to the quality of implementation, and the independence of the training program from the developer or other external agents.

Preparation Time

Preparation time, i.e., time required outside the classroom or other instructional setting, for grading, setting up activities, managing equipment, etc., should be minimal, and should not detract from time scheduled for other prep-time responsibilities of the implementer.

Availability

Availability of the materials, equipment or training necessary for implementation of the product must be assessed in terms of the ability of developers or publisher to meet user delivery deadlines, to replace or repair failing materials or equipment, and to adhere to agreed upon costs and quality of the product.

Durability

Durability of the product is defined by Coller (1976) as the extent to which the product has continuance, in the sense of not soon becoming obsolete, sturdiness in the sense of enduring hard use, and perpetuality in the sense of being easy to update so that it has lasting utility.

Support Staff

The need for support staff, such as clerks or paraprofessionals, has implications for cost, training and ease of use of the product, and should be assessed in terms of current staff resources and the relationship of staffing to implementability of the product.

Adaptability

Adaptability is defined by Coller (1976) as the extent to which the product can be easily changed to fit better the institutional conditions of the consumer without losing any of its essential qualities and/or effectiveness.

Replicability

Replicability is the extent to which the user must adhere to strict implementation standards in order to achieve the intended outcomes of the product; and the extent to which it is possible to achieve those outcomes without the participation or intervention of the developer or other external agent.

In the practicality cluster, the most essential criterion is the cost of the product and concomitant issues of training, durability, availability and adaptability.

Social Fairness

For purposes of the study, the social fairness product review criteria relate to the qualities of the product in terms of fairness, balance and/or affirmative treatment of women and minorities. These features of the product can best be assessed by careful review of the product itself, though information about the product can provide basic screening guidelines. Characteristics to be reviewed are the use of language when referring to races, nationalities, religions, the sexes and so forth.

Intrinsic Qualities

Choice and Accuracy of Content

Content issues require careful product examination. Content issues include issues previously addressed under desirability, such as the appropriateness of the materials for the target group's age, grade and ability levels. The reviewer is concerned about the breadth of the content in terms of its currency. Content issues include the treatment of current social, technological and scientific developments as they relate to the specific subject matter.

Instructional Methods

The instructional method should account for individual learner differences as well as be appropriate to the content. The method of instruction should allow easy implementation as well as adaptation. The scope and sequence of the materials should be clear, as should be the learning tasks. Evaluation procedures to be used by students should be clearly defined.

Educational Principles/Philosophy/Value Orientation of the Product

This criterion is one which may be of more interest to the community than to the students. It is an important criterion when screening or reviewing products for classroom use. For purposes of the study, the criterion will be documented rather than evaluated.

Clarity of Objectives

It is useful to have clearly stated instructional objectives from the developer/producer. The task of determining the appropriateness of the product to the setting is aided when the objectives are clearly stated. The objectives of the product will related to choice of content and appropriateness of the instructional design.

Aesthetic Appeal

This criterion covers issues of the physical quality of the product, the format, design and typology as well as the use of language, grammar and sentence structure. The aesthetic appeal issue should reflect the opinions and attitudes of students about using the product.

Developmental Design

This criterion relates to instructional methods, objectives and aesthetic appeal of the product. The design of the product should reflect care in the development of the content without calling attention to the design itself.

The social fairness and intrinsic qualities criteria both require examination of the product itself or careful documentation of the outcomes of usage, as in evaluation reports or learner verification and revision procedures. Judgments about these two clusters should be made on as much "hard" data as possible.

Learner/User Effects

For this criteria cluster, the reviewer must rely on data from external sources initially, since the product has not been used previously in the particular setting. Sources of such data include user reports, product catalogs and brochures from developers and publishers, or sponsors, etc. Ideally, a costly product is pilot-tested in a setting comparable to that of the intended users.

Under the learning effects cluster, unintended positive or negative side effects should be evaluated as well as the intended cognitive, affective, psycho-social, or psycho-motor effects. Integral to the examination of effects of the product is the analysis of the data describing these effects.

Evidence of Product Effectiveness

This criteria cluster addresses the issue of determining the effects realized and expected of products as well as assessing the credibility of the evidence provided to document the product's effectiveness.

Coller (1976) defines effectiveness as follows:

> To determine the relative desirability of the product/
> process in terms of the nature of effects, in respect
> to sum of effects and quality of effects; potency of
> effects, and meaningfulness of effects; cost/effectiveness,
> in respect to the ratio of the magnitude of effects to
> real costs, and interactive effects or, those effects that
> occur where the product/process comes into contact with a
> moderating variable.

In other words, in assessing effects the reviewer must consider the nature of the effects, i.e., the cognitive, psychomotor, social and affective effects, realized by the product; the objectives sought by the user in selecting the product; the cost related to achieving the effects; the duration of the effects and the interactive effects.

Schermer presents the following criteria for assessing effectiveness: 1) strength of the effect, i.e., how well does the product meet its stated goals and objectives; 2) long term effects such as impact and retention of learned matter; 3) comprehensiveness or number of effects, 4) scope of the effect, i.e., how widely does the effect reach; 5) comparative effectiveness in terms of competitive products or alternative methods of achieving the user's objectives; and 6) efficiency of the use of learners' time. (Schermer, 1975, pp. 54-56.)

With these compatible criteria in mind, the product review instrument of the study will examine the kinds of outcomes intended by the product in terms of cognitive, affective, social and psychomotor effects; document the kinds of tools, procedures and strategies used by developers to establish the nature and level of their effects; and judge on the basis of the data provided whether the results achieved under test conditions are generalizable to other target groups, whether they can be attributed to the product as opposed to other intervening variables, and whether the results have been objectively measured.

Careful Product Development

Design/Development Procedures

The criteria in this cluster relate to developer/publisher and sponsor responsibilities for using their expertise to develop quality products for use in the education market. Design/development procedures should be of such quality as to ensure their effectiveness to users. While methodology of research, development and evaluation in a linear progression may not be relevant to the consumer in terms of know-how, nor to developers in terms of time and resource constraints, the fundamental issues of adequate conceptualization and design of the product remain important. The intrinsic qualities of the product depend upon it. Data from developers about the procedures they have employed should be used by reviewers as an effective gage of the adequacy of the product design.

Formative and Summative Evaluation

The present study will document the evaluation activities of products included in the study. Formative evaluation will include formal and informal data-gathering which provides feedback to developers for the purpose of improving products. Summative evaluation is conducted by the developer, the sponsor, the publisher or the consumer after the product has been completed and out of the hands of the developer. Data from such evaluations should provide information about the use of the product under normal field conditions, i.e., about the generalizability of the product.

Learner Verification and Revision

In some places LVR has become a requirement for the adoption of products. The product review instrument will document the number of R&D products which have undergone that process.

Expert Reviewers

This criterion is included to determine whether the product has undergone a technical review using outside, qualified experts to judge the quality of the product during the formative stage of development.

Independent Evaluation

Like summative evaluation, this criterion assesses what has been learned about the product from persons other than the developer.

The issues under careful product development are included to document the kinds of procedures being used to determine the effectiveness of lab and center products. Few users have demonstrated an interest in the process of product development; however they are concerned with the outcomes. Developmental procedures are mainly of concern to developers and their sponsors.

APPENDIX B

CRITERIA FOR SUBMISSION OF EDUCATIONAL MATERIALS

TO

EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) CLEARINGHOUSES

GUIDELINES AND RATING SCALE FOR EVALUATING DOCUMENTS

Attached is a 10-point rating scale used by the Clearinghouse director to evaluate and decide the disposition of documents acquired by the Clearinghouse. The rating scale also assists potential contributors in selecting documents for submission to the Clearinghouse. The rating scale is based on three principal criteria: *appropriateness, accessibility,* and *significance.*

The first of these, *appropriateness,* is dealt with in the ERIC/CEM scope-note:

We define educational management to include all aspects of the administration, governance, and structure of public and private educational organizations at the elementary and secondary levels and the provision of facilities for their operation. We intend to acquire relevant documents and journal articles that bear upon the theory of practice of administration and governance and that are generated from the fields of educational, public, and business administration and from the humanities and the social and behavioral sciences.

Topics covered include social, technological, political, and legal context of the organization; state and federal programs and policies; methods and varieties or organizations, including various grade organizations, traditional and alternative schools, and re-scheduled school year plans; the tasks and processes of administration, encompassing policy development and long-range planning, finance, business management, law, public relations, staff personnel administration (e.g., collective bargaining, evaluation, affirmative action), pupil personnel administration, conflict management, curriculum development, computer applications (e.g., data processing, simulation models), and quantitative methods (e.g., operations research, systems analysis) physical environment, including facility planning and design, construction, equipment and furnishings, and maintenance; and preservice and inservice preparation of administrators.

The Clearinghouse seeks for its collection not only typical research reports with their hypotheses, procedures, and findings, but also published and unpublished conference papers, speeches, essays, curriculum guides or studies, announcements of research in progress, interim project reports, books, bibliographies, and other works of value for school administrators, professors, researchers, and the public.

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*ERIC Clearinghouse on Educational Management, University of Oregon, Eugene, OR.

The second criterion, *accessibility*, must be considered at almost every level of the rating scale. One of ERIC's primary objectives is to make high quality material widely available as soon as possible. For a number of reasons, much good material remains unpublished, or is published in local or state journals with limited distribution, or is not published for several months, even years following completion. Submission of materials to the Clearinghouse to be distributed through the ERIC Document Reproduction Service (EDRS) is one solution to this problem in the field of educational administration. The Clearinghouse also obtains for its local files all relevant materials that are widely disseminated through traditional channels. These documents are annotated and indexed at the Clearinghouse and provide a resource pool for the preparing of its information analysis products.

Significance cannot, of course, be measured quantitatively without a much more sophisticated and detailed apparatus than is available. However, it can be recognized; the director uses his experience and substantive expertise to assign rankings to these documents.

Rating Scale for Evaluating Documents*

1. *Reroute* to another clearinghouse. Not relevant to the domain of this Clearinghouse.

2. *Reject.* Materials of nonprofessional standard, appearing careless, naive, or the like; or an inhouse report so limited in scope or application that it would not be of interest to anyone outside the author's school, district, or state.

3. *Reject.* Personal reminiscences, abstract generalities, or the like. Perhaps entertaining, but contains little information.

4. *Reject.* Although not really a good piece of work, it does have s me features (e.g., procedures, data) which could be of value to later researchers.

5. *Reject.* Good work, but nothing new; a replication of previous well-known work; findings reinforce those of prior research.

6. *Reject.* Good work, but the topic is of interest only to certain highly specialized members of the profession.

7. *Reject.* Very good and of wide interest, but appearing in a high-visibility journal (i.e., a journal of high national circulation presumably available to the majority of school administrators or professors).

8. *Accept for RIE.* Good. Although a replication of previous work, findings differ from the earlier ones, or reinforce them for a different population. Low visibility.

9. *Accept for RIE.* A major new research project and/or a major contribution to thought or knowledge of the field, but not yet published in a high-visibility journal.

10. *Accept for RIE.* Because of its broad significance, this material should get the widest possible dissemination.

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*"Documents" include not only the research projects, but also conference papers, speeches, essays, curriculum guides and studies, research or progress analyses, books, bibliographies, and other works of value to school administrators, professors, researchers, and the public.

SUBMITTING DOCUMENTS FOR INPUT TO ERIC - SOME GUIDELINES FOR AUTHORS

The ERIC system is designed to collect, index, and microfilm educational documents of use to teachers, administrators, researchers, and scholars. Many of the documents are not available from any source other than the ERIC system. The documents come in many different sizes, formats, and forms, from Ditto and Xerox copies to printed material. In dealing with the wide variety of documents which are submitted to the system, various reproduction problems are met which limit the readability and value of a number of these documents. In some cases, documents cannot be accepted into the system because of these reproducibility problems.

Input to the system must be carefully monitored if a reasonable quality of document readability is to be maintained. A few basic fundamentals, if applied, can substantially enhance the overall quality and usefulness of the ERIC data base. Document producers, authors, and those submitting materials to ERIC, are advised to keep in mind the following principles:

1. PAPER

    a. Weight of paper should conform as nearly as possible to that usually acceptable in business typewritten media. Medium weight bond or reproduction paper stock of 16 to 20 pounds is ideal. Use of onion-skin and other flimsy or transparent types of paper should be avoided.

    b. Color of paper should preferably be white or a light tint, but should not include the darker shades or solid colors such as red, purple, orange, brown, blue, etc. Colored papers that reduce the contrast between the print and the background will not microfilm well.

    c. Size of paper is ideal when it is 8-1/2 x 11 inches. Larger sizes and foldouts will often create the need to make overlapping, multiple images of each page, with resultant viewing difficulties for the reader.

2. TEXT

    Text of a document should be oriented, whenever possible, parallel to the short dimension of the paper.

3. TYPE SIZE

    To insure acceptable reproduction in both microfiche and hard copy, minimum type size should be 6-point type. In this size type, the height of the lower case letter "e" is approximately 1.6 millimeters. This is about the thickness of a five-cent piece. The type font of a standard typewriter, pica or elite, is well above the minimum acceptable size. Extremely narrow lines in drawings or type do not reproduce well and should be avoided.

4. <u>TYPE DENSITY</u>

It is important that the density or "blackness" of the type be as great
as possible. Original copies rather than copies should be submitted.
In some cases, where the typewriter ribbon is old, even an original copy
may be faint and may not reproduce well. In this special case, a Xerox
copy may improve the type density. Purple "Dittos," colored inks, and
blueprints, in general, will not reproduce satisfactorily.

5. <u>APPENDIX MATERIALS</u>

Because appendix materials are frequently reproduced from other sources,
care should be taken to see that these materials are legible and meet
the standards discussed above. If appendix materials are marginal,
consideration should be given to omitting the questionable material.

APPENDIX C

SPECIMEN JDRP SUBMISSION:

San Diego State University Teacher Corps Project

SYSTEM FOR INDIVIDUALLY GUIDING MASTERY ATTAINMENT

(SIGMA)

Approved by the JDRP on 8 May 1979

PROGRAM AREA: Teacher Corps — Competency-Based Teacher Education

PROJECT TITLE: SIGMA — System for Individually Guiding Mastery Attainment
San Diego State University, San Diego, California

DEVELOPED BY: Staffs of Cycle VI and VIII — Teachers Corps Projects

SOURCE AND LEVEL OF FUNDING: (The following are IHE budget totals only.)
U.S.O.E. Teacher Corps Cycle VI $219,482
U.S.O.E. Teacher Corps Cycle VIII $260,414

YEARS OF INTERVENTION DEVELOPMENT:
The development and field-testing period was 1971 through 1975.

BRIEF DESCRIPTION OF INTERVENTION:
The objective of this intervention was to develop, field-test, and evaluate a 31 credit hour, two semester, competency-based, preservice elementary teacher education program. The program was to be individualized through modules (learning packages), personalized, team taught, and organized by flow charted competencies rather than courses.

Context and Students Served:
San Diego State University is a large urban university where most students do not live on campus. The Department of Elementary Education is the largest of seven departments in the College of Education and employs approximately 40 full-time faculty. While there are a growing number of minority students in elementary education, the great majority are white, middle class females. Student teaching experiences are arranged so that each candidate is placed at least once in a racially or ethnically different environment.

Program Description:
The content objectives of the SIGMA program are the same as those approved by the California State Commission for Teacher Preparation and Licensing for all other elementary credential sequences at San Diego State University. However, the organization and delivery of instruction is radically different. The content emphasis is not identified as course work, but flow-charted into a skills development sequence intended for the most part to impart generic teaching skills transferable to all settings. The selection and sequencing of these skills requires that the content be highly integrated, not only horizontally, but vertically between skill strands to establish prerequisites and interrelationships.

Objectives generated from the identification of skill areas are of four types: knowledge, performance, consequence, and affective. A concerted effort is maintained to demand actual performance in realistic teaching situations. Since decisions on program development are made as a faculty team, duplications or omissions of content such as might be found in a typical series of courses are eliminated.

Modules are used to individualize the program so that students move through the skill development strands at their own pace. Each module incorporates six characteristics:
1) behaviorally stated objectives including terminal behavior, assessment conditions, and criterion level;
2) behaviorally stated prerequisites for each module;
3) a preassessment based on the objectives;
4) a variety of learning alternatives teaching to each objective;
5) a postassessment based on the objectives; and
6) a provision for remediation if exit criterion is not met on any objective.[1]

This instructional delivery system utilizes 28 modules in the fall semester and 15 in the spring semester, and enables the student to attain objectives in a variety of skill areas. The student, through conferences and small group meetings, is assisted by instructors to successfully complete the module requirements. Each student is assigned to an on-site classroom in which the performance required by each module is evaluated in a realistic educational setting. A concurrent seminar is conducted throughout each semester to provide continuity and large group interaction, and to allow for further instructor input as needed.

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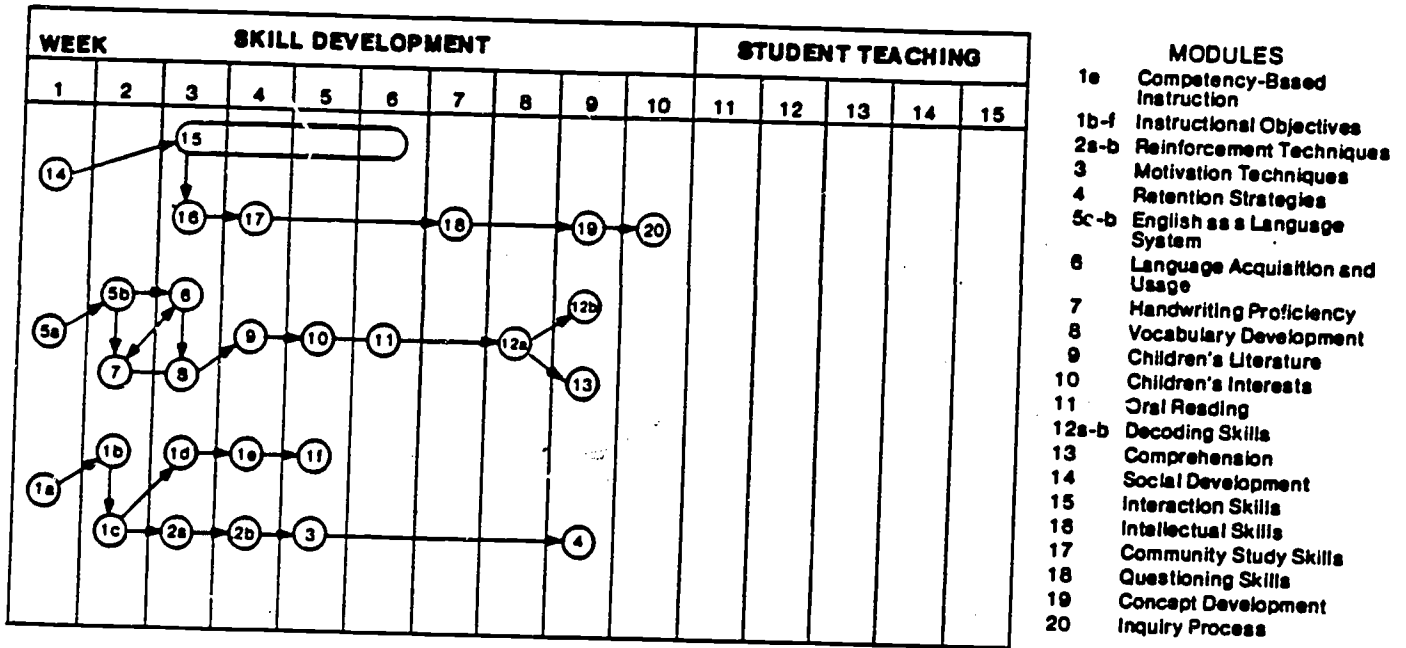The following figures depict the module sequence in each of the semesters of SIGMA.

FIGURE 1
Flow Chart for Skill Development and Student Teaching - First Semester   (15 Weeks)
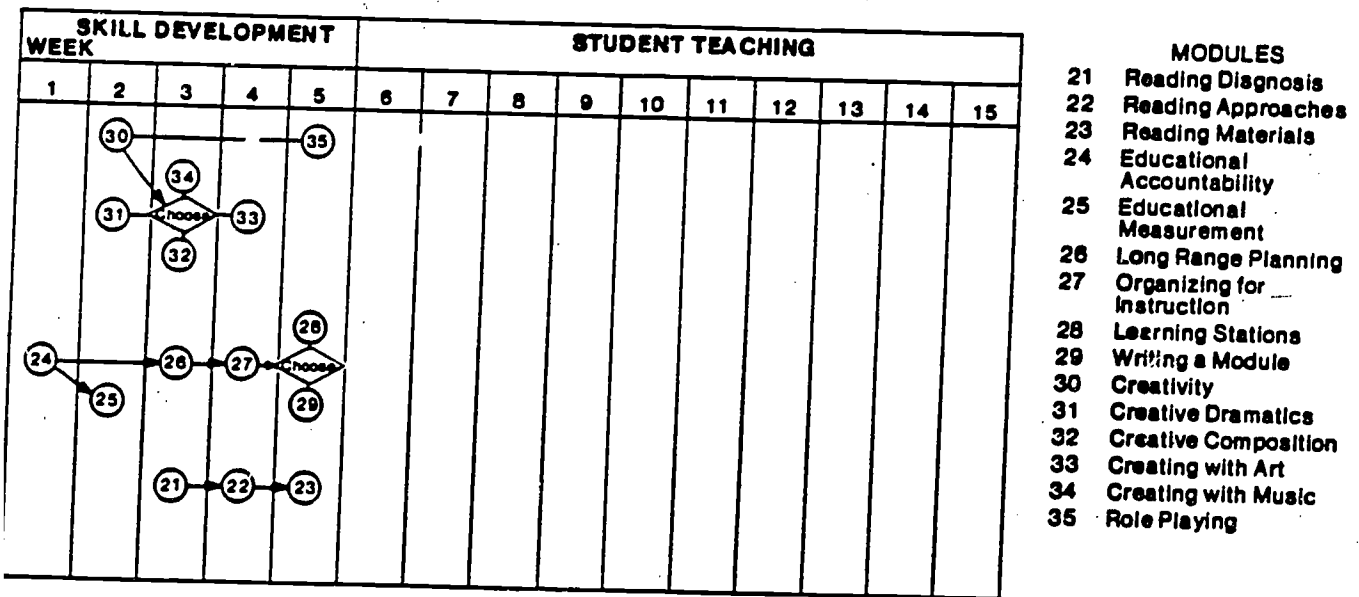

FIGURE 2
Flow Chart for Skill Development and Student Teaching — Second Semester (15 Weeks)

The method and organizational system when compared to the normal programs requires a number of modifications in the roles of all participants. The students are required to assume much more responsibility for their own learning; the university instructor is relieved of much of the task of information delivery and becomes a manager, counselor, and facilitator; the cooperating classroom teacher becomes pivotal in providing opportunities for classroom experiences which help students bridge from theory to practice. The highly personalized approach to instruction and the creation of a noncompetitive learning environment results in the development of cooperative group behaviors. The positive group feeling creates an esprit de corps that keeps motivation high during the entire year.[2]

Organizational structures chosen to deliver the model involve a campus-based learning center and field-based laboratory. Campus facilities were provided in the form of an Individualized Study Center (ISC) to support the model with print, audio, and video media.[3] The SIGMA faculty team normally consists of five university faculty who work with a group of about 30-35 student teachers all year and are responsible for all skill development requirements and on-site supervision.

Criterion-referenced assessments based on behaviorally stated objectives are used to evaluate student teachers. The criteria stress attainment of mastery, and modules provide for remediation in order to reach that level. Should a student not attain mastery he/she is provided with the opportunity to remediate the specific weakness which the instructor diagnoses. In most instances, all that the student needs in order to achieve mastery is more time to study or practice. If remediation is still needed at the end of a semester, the student is given a grade of "Incomplete."

Evaluation of full-time student teaching is highly correlated with the modular part of the program. During the first semester's field experience, each student is evaluated on the ability to integrate the previously developed competencies into his/her performance while working with a group of children. During the second semester, full-time field experience, each student and cooperating teacher identifies the objectives that the student will try to accomplish with the children in the assigned classroom. The student develops and negotiates a contract with the cooperating teacher and university supervisor which specifies certain desired consequences from working with the children. The final evaluation is based on the student's demonstrated effectiveness in fulfilling this accountability contract.

In order to make SIGMA a regenerative program, responsive to students and changing perspectives, both summative and formative data are collected periodically.

EVIDENCE OF EFFECTIVENESS:

In the 1974-1975 school year Donald F. Enos collected data on the SIGMA program and a control group, and in 1975-1976 he did a follow-up study of employed graduates of both programs, analyzed data, and documented the results.[4] He was assisted with data collection from time to time by graduate students from San Diego State. However, none of those involved in conducting the research were at any time involved with the development or implementation of the SIGMA program. Additionally, no member of the SIGMA faculty team or any other faculty or students were involved with the specification of hypotheses, data collection, analysis, or reporting results and conclusions.

The SIGMA program (N=33) was conducted by three faculty plus two student teaching supervisors while the control group program (N=40) was run by twelve faculty and six supervisors. The treatment for the control group was the regular instructional program in elementary education consisting of a foundations course and several methods courses in a variety of subject areas. The number of credit hours in each program was equal. Control group students were taught mostly through lecture and discussion, and evaluations were of a norm-referenced variety.

It was not possible, because of administrative constraints, to randomly assign student teachers to the two programs, but it is believed that the groups were comparable since students were not selected especially for either program. All were enrolled on the basis of the regular registration procedure used by the Department of Elementary Education. Additionally, no significant differences were found when comparisons of pre-enrollment interview ratings, GPAs, or numbers of men and women were made for the two programs. It should also be noted that students were observed to be more reluctant to enter the SIGMA program since it was an unknown and, in fact, the SIGMA block was the last to fill at registration out of a total of eight blocks available. As a result, it is believed that the two groups of students were as equivalent as they would have been had it been possible to make random assignments.

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Claims of Effectiveness:

Evidence of effectiveness will be presented in four areas. When compared with a control group, the SIGMA program:

1. Demonstrates a significantly greater level of student knowledge on an examination of the competencies approved for elementary education at San Diego State University by the California Commission for Teacher Preparation and Licensing.

2. Demonstrates significantly better student teacher verbal interaction with children as measured by Reciprocal Category System, both during the certification programs and in a follow-up study of employed graduates.

3. Demonstrates significantly more use of individualized instruction by student teachers when working with children as measured by the Descriptive Observational Record for Individualized Instruction and the Individualized Instruction Inventory, both during the certification programs and in a follow-up study of employed graduates.

4. Demonstrates significantly higher ratings of student teacher performance by the children taught as measured by the Student Evaluation of Teacher Instrument, II, both during the certification programs and in a follow-up study of employed graduates.

Claim of Effectiveness 1: When compared with a control group, the SIGMA program demonstrates a significantly greater level of student knowledge on an examination of the competencies approved for elementary education at San Diego State University by the California Commission for Teacher Preparation and Licensing.

In order to assess student knowledge in both SIGMA and control groups, an examination was developed by Dr. Donald Enos from the program objectives contained in the Department of Elementary Education Program approved by the California State Commission For Teacher Preparation and Licensing. All of the various block programs within the department are directed to teach to these same objectives. Kuder-Richardson formula 21 reliability was found to be 0.79 for the exam.

A significant difference favoring SIGMA was found between the two groups on this examination at the .001 level for both the fall and spring semester. A significant difference at the .001 level was also found on the composite analysis for the 1974-1975 academic year (see Table I). The SIGMA student teachers were able to demonstrate significantly greater attainment of the objectives specified in the Department of Elementary Education's approved program.

TABLE I
Results for
Student Knowledge Assessment of Teacher Education

SEMESTER	SIGMA (N = 33) MEAN	SD	RTE (N = 40) MEAN	SD	df	t
Fall	11.91	2.01	5.50	2.72	71	11.25*
Spring	10.33	2.99	6.95	4.41	71	3.52*
Year	22.24	3.88	12.85	5.37	71	11.89*

*Significant difference in favor of SIGMA at the .001 level.

Claim of Effectiveness 2: When compared with a control group, the SIGMA Program demonstrates significantly better student teacher verbal interaction with children as measured by the Reciprocal Category System, both during the certification programs and in a follow-up study of employed graduates.

The importance of good verbal interaction between teachers and students is widely recognized as important in producing a positively reinforcing environment in terms of attitudes and expectations. Studies by Flanders and others have shown significant gains in pupil achievement after working in a positive verbal climate. A summary of the research evidence by Amidon and Hough[5] finds that several reports show essentially the same thing — teachers who are more "indirect" in the Flanders system (i.e., accept feelings, praise or encourage, accept ideas, and ask questions), have students who learn more and like school better.

4

The *Reciprocal Category System* for verbal interaction analysis was developed by Richard Ober.[6] This system was used to code verbal interaction into the following five categories: a) Warm/Cool Ratio, b) Acceptance/ Correction Ratio, c) Elicit/Initiate Ratio, d) Children's Talk/Student Teacher Talk Ratio, and e) Acceptance/ Rejection Ratio. Inter-rater reliability was found to be .91 before data collection began.

Significant differences favoring the SIGMA Program were found in 17 out of 20 Chi Square tests of data on verbal interaction as measured by the *Reciprocal Category System* (see Table II). The student teachers of the SIGMA program were able to demonstrate significantly better verbal interaction with children than were student teachers in the RTE program. The differences noted were as follows:

1. The ability to provide for and personally utilize more positive reinforcement and the elimination of tension within the classroom.
2. The ability to provide a more accepting classroom atmosphere and to facilitate the development of more positive feelings within the children.
3. The ability to provide increased opportunities for children to present unsolicited facts, information, and opinions during the instructional process.
4. The ability to facilitate the children's interactions within the classroom.

TABLE II
Results for Verbal Interaction
Measured by the Reciprocal Category System

Category	Measurement Period	Ratio Achieved SIGMA	RTE	x^2	df
Warm/Cool	Year '74—'75	5.43	0.55	381.68*	1
	Fall '74	4.12	2.62	4.07**	1
	Spring '75	7.03	0.25	432.92*	1
	Follow-up '75	45.60	0.25	123.16*	1
Accept/Correct	Year '74—'75	9.73	2.11	277.18*	1
	Fall '74	8.95	1.91	158.35*	1
	Spring '75	10.61	2.52	100.39*	1
	Follow-up '75	13.33	1.03	73.58*	1
Elicit/Initiate	Year '74—'75	1.01	.79	74.46*	1
	Fall '74	1.35	1.21	2.26	1
	Spring '75	.85	.51	81.67*	1
	Follow-up '75	.68	.82	1.93	1
Student Teacher Talks/ Children Talk	Year '74—'75	1.22	1.95	533.17*	1
	Fall '74	1.44	1.91	98.48*	1
	Spring '75	1.05	1.98	506.67*	1
	Follow-up '75	1.19	1.31	1.57	1
Acceptance/Rejection	Year '74—'75	9.80	1.89	585.39*	1
	Fall '74	9.01	2.94	132.84*	1
	Spring '75	10.72	1.08	586.33*	1
	Follow-up '75	44.23	1.02	222.21*	1

* Significant difference in favor of SIGMA at the .001 level.
** Significant difference in favor of SIGMA at the .05 level.

As noted above, a follow-up study of graduates of both programs was done during fall 1975. Only six of the 40 RTE program graduates and 12 of the 33 SIGMA graduates had found employment by that time. Results from such a small sample cannot be conclusive; however, they can provide some indication as to whether or not the findings of the year-long study are maintained. It is believed that the follow-up study results help to support the validity of the conclusions of the basic study.

Claim of Effectiveness 3: When compared with a control group, the SIGMA program demonatratea significantly more use of individualized instruction by student teachers when working with children aa measured by the Deacriptive Observational Record for Individualized Instruction and the Individualized Instruction Inventory, both during the certification programs and in a follow-up study of employed graduates.

It had been the intention of the SIGMA developers to model a type of individualized Instruction which would be emulated by student teachers in their work with children. The competency-based Instructional approach ia a particular type of Mastery Learning, and reviewa of research on Maatery Learning by Block[7] and others have shown dramatic achievement gaina by puplis. In summary, Therese M. Herman[8] concludea that research with individualized instruction of all kinds clearly demonstrates that many students who use it learn at least aa well, sometimes better, and often, though not always, more quickly than they learn with other kinds of inatruction.

The instruments chosen to assess atudent teachers' degree of individualizing were the *Descriptive Observational Record for Individualization of Instruction (DORII)* by Ban Harris and Ken McIntyre and the *Individualization of Instruction Inventory* (III) by Betty Coody and Ben Harris.[9] These instrumenta grouped data into the following factors: a) Intra-Claaa Grouping, b) Variety of Materials, c) Pupil Autonomy, d) Differentiated Assignments, and e) Tutoring. Inter-observer reliability was found to be .89 before data collection began.

Significant differences at the .001 level were found for individualization of instruction measured by DOR II and III in all but the categories of Intra-Class Grouping and Variety of Materiaia for the fall semester, 1974 (see Table III). The SIGMA program provided an increased number of training techniques for the atudent teachers In individualizing instruction within the classroom. The SIGMA program student teachers provided more flexibility and direct, task-oriented situationa for children; a wider variety of available materials throughout the classroom; and greater pupil participation in planning, self-direction, leadership in groups, and individual activities. The SIGMA program student teachers also provided greater challenges in children's assignments, as well as relationship of the assignments to diagnosed learning needs, and tutoring of individuals with learning problems.

TABLE III
Results of Individualization of Instruction
Measured by DOR II and III

Category	Measurement Period	SIGMA Mean	SD	RTE Mean	SD	df	t
Intra-Class Grouping	Year '74—'75	19.12	1.74	17.36	1.89	71	4.07*
	Fall '74	18.57	2.37	18.37	2.16	71	1.75
	Spring '75	19.67	2.82	16.35	3.01	71	4.78*
	Follow-up '75	22.30	1.43	17.00	2.12	12	7.46*
Variety of Materials	Year '74—'75	17.91	1.51	14.95	1.33	71	8.93*
	Fall '74	16.58	2.09	16.45	2.05	71	0.26
	Spring '75	19.24	2.32	13.45	1.78	71	12.06*
	Follow-up '75	21.70	1.87	16.00	1.87	12	7.22*
Pupil Autcnomy	Year '74—'75	17.33	1.59	15.15	1.33	71	6.39*
	Fall '74	17.24	2.11	15.35	1.63	71	4.33*
	Spring '75	17.42	2.69	15.03	1.88	71	4.46*
	Follow-up '75	20.30	0.82	15.80	1.48	12	10.00*
Differentiated Assignments	Year '74—'75	18.48	1.47	15.08	1.43	71	9.89*
	Fall '74	17.39	1.87	15.75	1.72	71	3.91*
	Spring '75	19.45	2.62	14.40	1.99	71	9.34*
	Follow-up '75	21.70	1.41	16.25	3.03	12	6.19*
Tutoring	Year '74—'75	17.94	1.89	14.30	1.73	71	8.53*
	Fall '74	17.97	3.01	15.08	2.02	71	4.90*
	Spring '75	17.91	2.72	13.55	2.43	71	7.23*
	Follow-up '75	20.60	2.00	15.00	1.56	12	7.00*
Total Individualization of Instruction	Year '74—'75	90.73	6.91	76.76	5.88	71	9.26*
	Fall '74	87.76	9.84	81.13	7.24	71	3.31*
	Spring '75	93.69	10.96	72.77	9.49	71	8.74*
	Follow-up '75	106.90	4.91	80.00	9.11	12	9.71*

* *Significant difference in favor of SIGMA at .001 level.*

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While the sample size for the follow-up study is small, it does provide results consistent with those found during the earlier periods of student teaching.

Claim of Effectiveness 4: When compared with a control group, the SIGMA program demonstrates significantly higher ratings of student teacher performance by the children taught, as measured by the Student Evaluation of Teacher Instrument, II, both during the certification programs and in a follow-up study of employed graduates.

Students' attitudes toward their teacher are often used in the profession as one index of teaching effectiveness. However, according to Getzels and Jackson, research provides mixed support for a direct link between pupil attitudes and outcome measures such as achievement.[10] Even so, it is believed to be both sensible and desirable for a teacher to strive toward being liked by pupils as long as instruction quality is not sacrificed.

The instrument selected to sample childrens' attitudes was *Student Evaluation of Teacher Instrument II (SETII)* by Ruth Haak, Douglas Kleiber and Robert Peck.[11] Children's attitudes toward their student teacher were sampled for each of the following factors: a) Interactional Competence, b) Rapport, c) Stimulating, Interactive Style, d) Unreasonable Negativity, and e) Fosterance of Self-Esteem. Published reliabilities indicate that r = .75 for kindergarten, t = .82 for grades 1—3, and r = .78 for grades 4—6.

Each student teacher's overall performance was rated by the children they had worked with using the SETII. A grand total of 2,019 children rated the SIGMA student teachers and 2,248 children rated the student teachers in the control group. For the spring semester and the composite analysis for the 1974-1975 academic year, significant differences were consistently found favoring the SIGMA program except for the kindergarten classes (see Table IV).

Only one significant difference in favor of the RTE program was found ("Unreasonable Negativity," fall semester, grades 1-3). Subsequent investigation and analysis reversed that finding in the spring semester, 1975, and again in the follow-up study during the fall semester 1975. These analyses suggested that the SIGMA program provided better opportunities for the student teachers to be understood by the children in the classroom.

When examining Table IV, the null hypothesis must be accepted for the fall semester because there is a consistent pattern of no significant difference in children's ratings of student teacher performance. However, during the measurement periods of spring 1975 and follow-up 1975, significant differences in ratings of the children were observed favoring the SIGMA program student teachers in the areas of stimulating, interactive style, rapport, interactional competence, unreasonable negativity, and the fosterance of self-esteem.

Controls for Internal Validity:

Threats to the internal validity of the study were controlled as follows:

1. *History Effect:* SIGMA AND RTE programs were conducted in the same time period and thus were subject to the same external forces.
2. *Maturation Effect:* The use of a control group helps to limit any possible maturation effect, but there is a possibility of a Hawthorne Effect. However, the SIGMA program consists of a year of very hard, full-time work; and this combined with the results of the follow-up study tend to make it appear unlikely that a Hawthorne Effect was operating.
3. *Testing Effect:* If there were any testing effect it would have worked equally on each program group.
4. *Instrumentation:* Reliability and validity for instruments and observers were substantiated and/or maintained at high levels.
5. *Statistical Regression:* No student teachers were selected for their extreme scores.
6. *Mortality:* No students were lost from either SIGMA or the RTE program groups.
7. *Selection Effect:* Since random assignment of students to each program was not possible, there is a chance of a selection effect, but as was noted earlier students did not differ significantly in interview ratings, GPA, or numbers of men and women. Students chose the program they wished, and SIGMA was the last program to fill at registration. Due to these circumstances it is believed the groups were equivalent.
8. *Selection-Maturation Interaction:* It is believed this was controlled as noted in numbers 2 and 7 above.

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TABLE IV
Results of Student Evaluation of Teacher Instrument II

Factor	Measurement Period	Grade	SIGMA Mean	SIGMA SD	RTE Mean	RTE SD	df	t
Stimulating, Interactive Style	Year '74—'75	K	9.61	0.37	10.17	0.84	24	2.24***
	Fall '74	K	10.17	0.39	9.97	0.58	11	0.89
	Spring '75	K	9.72	0.35	10.61	0.63	10	3.91**
	Follow-up '75	K	9.49	0.13	*No teachers at this level*			
	Year '74—'75	1-3	9.64	0.50	10.52	0.76	58	7.38*
	Fall '74	1-3	9.87	0.63	10.23	0.76	26	1.45
	Spring '75	1-3	9.46	0.28	10.75	0.75	14.37	5.96*
	Follow-up '75	1-3	9.36	0.14	10.58	0.41	6	8.13*
Development of Rapport	Year '74—'75	4-6	5.47	0.37	5.92	0.64	70	5.12*
	Fall '74	4-6	5.59	0.41	5.76	0.63	30.89	1.03
	Spring '75	4-6	5.28	0.17	6.03	0.63	27.16	5.34*
	Follow-up '75	4-8	5.02	0.02	6.77	2.60	2	125.00*
Interactional Competence	Year '74—'75	4-6	4.43	0.25	4.69	0.45	70	4.29*
	Fall '74	4-6	4.53	0.24	4.57	0.50	25.72	0.35
	Spring '75	4-8	4.27	0.18	4.78	0.36	33.17	5.47*
	Follow-up '75	4-8	4.09	0.01	4.94	2.22	2	70.83*
Unreasonable Negativity	Year '74—'75	K	9.32	0.69	8.86	1.11	24	1.65
	Fall '74	K	7.98	0.48	8.78	1.35	11	1.58
	Spring '75	K	9.66	0.10	8.96	0.64	3.07	2.17
	Follow-up '75	K	9.80	0.03	*No teachers at this level*			
	Year '74—'75	1-3	9.34	0.46	8.86	0.96	58	3.51*
	Fall '74	1-3	8.91	0.37	9.47	0.41	26	3.83†
	Spring '75	1-3	9.68	0.17	8.18	1.01	12.49	5.28*
	Follow-up '75	1-3	9.91	0.08	8.70	0.42	6	8.07*
	Year '74—'75	4-8	9.40	0.51	8.94	0.75	70	4.21*
	Fall '74	4-8	9.28	0.45	9 25	0.74	29.29	0.17
	Spring '75	4-6	9.58	0.58	8.81	0.74	34	3.21**
	Follow-up '75	4-8	9.68	0.34	7.97	2.82	2	19.88**
Fosterance of Self-Esteem	Year '74—'75	K	6.67	0.33	6.84	0.72	24	1.10
	Fall '74	K	7.15	0.21	6.78	0.53	11	1.87
	Spring '75	K	6.55	0.26	7.05	0.57	3.63	1.67
	Follow-up '75	K	6.39	0.04	*No teachers at this level*			
	Year '74—'75	1-3	6.62	0.24	7.09	0.22	58	5.33*
	Fall '74	1-3	6.98	0.54	6.88	0.52	26	0.50
	Spring '75	1-3	6.34	0.19	7.24	0.38	16.28	7.65*
	Follow-up '75	1-3	6.29	0.10	7.40	0.08	6	20.94*
	Year '74—'75	4-6	6.97	0.44	7.52	0.60	70	4.46*
	Fall '74	4-6	7.33	0.61	7.23	0.00	37	0.47
	Spring '75	4-8	6.41	0.28	7.65	0.75	30.75	7.11*
	Follow-up '75	4-8	6.42	0.34	8.90	2.98	2	27.87**

* *Significant difference in favor of SIGMA at .001 level.*
** *Significant difference in favor of SIGMA at .01 level.*
*** *Significant difference in favor of SIGMA at .05 level.*
† *Significant difference in favor of RTE at .001 level.*

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Costs for Adoption and Maintenance:
In 1976 costs were as follows:[4]

PERSONNEL	INSTALLATION	SUBSEQUENT YEARS
1. Training Consultants	$1,225	0
2. Faculty Team	9,618	Same as Regular Program
3. ISC Supervisor	4,625	$9,250
INDIVIDUALIZED STUDY CENTER		
1. Facility Development		
a. Furniture	3,500	0
b. AV Equipment	4,250	250
c. Remodeling	4,000	0
2. Software for Modules	$3,062	150
CONSUMABLES - 35 sets of modules for students	412	Paid by Student Fee
TOTALS	$30,692	$9,650

CONCLUSIONS:

The Enos study has presented very strong support for the effectiveness of the SIGMA program and establishes it clearly as a viable alternative to regular programs of elementary teacher preparation. The study has demonstrated that student teachers completing the SIGMA program obtained the following benefits compared with student teachers completing the regular program:

1. Significantly greater knowledge about teaching and learning,
2. Significantly better verbal interaction with children,
3. Significantly greater use of individualized instruction, and
4. Significantly higher ratings of their performance from children they taught.

The outcomes of this study seem to be consistent with those being achieved with Mastery Learning in a variety of other subject matter areas.[7] Additionally, SIGMA appears to be generalizable and disseminable. It is believed that the dissemination to adopters should include careful counseling and training, systematic assembly of modular components, preparation of an Individualized Study Center, and follow-up visits from consultants. All of these requirements appear to be realistically feasible for dissemination and implementation at other sites in IHEs, LEAs, or even some county or state offices should such desire to credential preservice elementary teachers. Since most of the competencies are generic in nature, no conflict is anticipated with state laws; however, states may have additional requirements beyond SIGMA which could be handled in a traditional manner.

It is believed that SIGMA is a disseminable program which has been successful in raising the quality of new teachers entering the profession, while at the same time providing a model for teachers to emulate in working with children.

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