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ABSTRACT

Vocational education research and development (R&D) product evaluations are difficult to conduct for several reasons, such as the many types of R&D products, the multiple users of the products with different goals for evaluation, the limited time available, and the high cost. In order to meet these challenges, an internal evaluation team at the National Center for Research in Vocational Education developed a conceptual framework for evaluating R&D product impact. The conceptual framework was a linear model with five stages: development, distribution, implementation, utilization, and effects. Two different types of impact criteria were presented in the framework: formative and summative. A more specific model was created to measure product impact. The formative criteria that were addressed in this model were user orientation, support systems, and integrated utilization; and the summative criteria were user satisfaction and individual growth. A modeling approach known as structural equation modeling can be used to determine the degree to which the proposed model actually represents the R&D product impact phenomenon in the population. LISREL, an acronym for linear structural relationships, is a computer program developed to analyze structural equation models. The results of a LISREL analysis will give evidence of the fit of the model in the population and the fit of individual parameters. LISREL possesses a number of features that bring enormous potential for analyzing other vocational education R&D phenomena. (References on LISREL are included in the report.) (KC)

AN APPLICATION OF MODELING TO VOCATIONAL EDUCATION R&D PRODUCT EVALUATION

Debra DeVore Bragg and William L. Hull

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AN APPLICATION OF MODELING TO VOCATIONAL EDUCATION R&D PRODUCT EVALUATION

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The evaluation of research and development (R&D) products has been a highly specialized endeavor conducted primarily by federal agencies, federally-sponsored research centers and some state departments of education. Some individuals who have conducted R&D product evaluations have found their evaluation responsibilities frustrating, yet usually challenging. The necessity for understanding the impact of R&D products has perpetuated evaluation efforts in spite of the complexity involved in designing and conducting impact evaluations. Even though the approaches to conducting impact evaluation of R&D products have been widely debated, diverse approaches have revealed benefits of R&D product use. Impact evaluations have provided evidence of accountability as well as change in R&D product users.

This presentation was designed to illustrate an approach to evaluating the impact of vocational education R&D products by utilizing structural equation modeling. The objectives for the presentation were:

(1) to describe the complexity of designing and conducting impact evaluation for R&D products,

(2) to describe the R&D conceptual framework,

(3) to apply LISREL to an R&D product impact model, and

(4) to summarize the strengths and weaknesses of LISREL.

The Complexity of R&D Product Impact Evaluation

There are several reasons why R&D product impact evaluations have been difficult to conduct. First, there are a number of types of R&D products. These R&D products range from information papers to curriculum guides to student handbooks. The varying features of these R&D products have made comparisons among R&D products difficult and clouded the expectations of evaluators. In addition, there are multiple users of R&D products. Some R&D products developed by The National Center for Research in Vocational Education (NCRVE), for instance, have been used by such diverse types of organizations as international educational organizations, community colleges, local school boards and junior high schools. Certainly, the goals of these users differed. It was necessary to determine the individual user's goals in order to evaluate the effectiveness of R&D products. Furthermore, different stakeholders such as R&D product sponsors, administrators and developers held different expectations for product use. For example, R&D product sponsors have been concerned with the frequency of use or spread of various R&D products, while R&D product developers were more concerned with intensity of use within specific organizations.

There were additional constraints placed upon R&D product evaluators. First, typically the time to conduct an evaluation was not limitless. A political mandate to determine the impact of R&D products sometimes prompted the onset of an impact evaluation too early. Furthermore, the cost of conducting R&D product evaluation has been high. The cost of collecting data has usually increased as methodology has increasingly involved personal contact. Normally case studies have been more expensive to conduct than mail surveys. In order to ascertain individual goals of R&D product users, personal contact with R&D product users was necessary. Finally, some evaluators have advocated the use of naturalistic inquiry for R&D product evaluations because of the diversity of R&D products, differing individual goals, and varying roles and organizations of users. These evaluators have found that more rigorous approaches such as quasi-experimental or experimental designs have placed unrealistic controls on R&D product users.

R&D Conceptual Framework

Many evaluators of R&D products have searched for general guidelines to assist them in conducting practical, appropriate and useful R&D product impact evaluations. In order to address this problem, an internal evaluation team at NCRVE developed a conceptual framework for evaluating R&D product impact. The conceptual framework was developed to maximize the use of practical evaluation methods to address program improvement as well as impact. The evaluation team was committed to the following:

- using multiple sources of data
- accepting interwoven, and sometimes conflicting, program goals.
- looking for accountability as well as effects data.

The conceptual framework drew heavily on two bodies of literature (1) program evaluation and (2) change theory, especially the literature on diffusion of innovations. The conceptual framework was needed to help design impact evaluations in a cost effective and efficient manner. The primary goal of the conceptual framework was to present criteria which could be used to determine the likelihood of impact occurring based upon the degree to which quality, distribution, implementation and use of R&D products had occurred. Furthermore, the conceptual framework combined the goals of providing evidence to improve educational programs and document change.

An evaluation team at NCRVE at The Ohio State University developed a conceptual framework to aid in estimating the impact of R&D products. This framework evolved over a five year period, 1978-82, as evaluations were conducted in a series of studies on vocational education R&D products. The central data base for constructing this framework was obt ned through impact studies of 28 selected state-developed and NCRVE products. Both qualitative and quantative data were collected through case studies and surveys. An extensive review of the diffusion literature revealed 267 impact studies of educational innovations.

After the framework was developed, it was reviewed by participants in the fifth nationwide Vocational Education Dissemination and Utilization Conference, and revised. Since that conference, the framework and criteria have been reviewed by nine experts in dissemination and evaluation establishing its content validity. Three important assumptions made in the development of the framework were:

(1) New ideas could be packaged in a transportable format for use in diverse settings.

(2) The primary output from a funded R&D project, normally a R&D product, was the most usable vehicle for tracing

effects of the project.

(3) Accountability was the driving force behind most impact studies.

The conceptual framework for measuring the impact of R&D products was a linear model with five stages; development, distribution, implementation, utilization and effects (Figure 1). These five stages depicted the logical flow of product development to program improvement. The importance of viewing program improvement as an interactive and cyclical process was represented by the dotted feedback line in the figure.

A conceptual framework illustrating the five stages and criteria were provided through figure 2. The conceptual framework presented two different types of impact criteria; formative and summative. Criteria inherent in the first four stages of the conceptual framework were considered to be formative impact criteria. The primary purpose of evaluations conducted during these stages was to enhance the impact potential of the R&D product. Effects criteria were considered summative. The model hypothesized that an R&D product that was systemically developed, strategically disseminated, selectively implemented and used in an integrated manner was more likely to result in greater impact than a product which did not meet these criteria (Hull, Adams and Bragg, 1983).

Briefly, the stages were defined to clarify the intent of the conceptual framework. (The definitions of the R&D impact criteria were presented in Appendix A.) Development referred to the way the R&D product was produced. It was essential that R&D products be high in

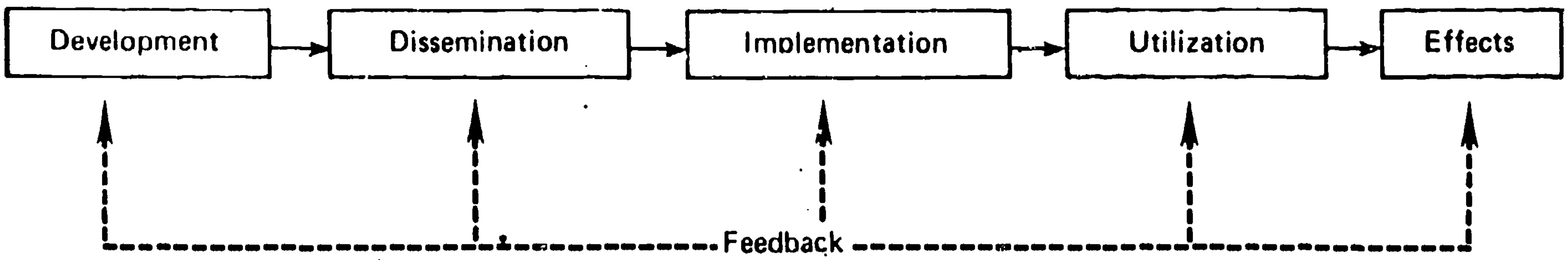

Figure 1. R&D PROGRAM IMPROVEMENT STAGES

DEVELOPMENT	DISTRIBUTION	IMPLEMENTATION	UTILIZATION
Systematic Development	Strategic Dissemination	Sequential Implementation	Multiple Patterns
High Quality	Multiple Channels	Support Systems	Integrated Utilization
User Orientation	Widespread Dissemination	Cost Feasibility	Time on Task
FORMATIVE			

EFFECTS
USER SATISFACTION
INDIVIDUAL GROWTH
ORGANIZATIONAL CHANGE
SOCIETAL CONTRIBUTIONS
SUMMATIVE

Figure 2. R&D Impact Criteria

quality, as evidenced through scholarship, to have impact. In addition, it was critical that the R&D product be relevant to the needs of the potential adoption site.

Distribution, the second stage, was clearly an important stage in the program improvement process. Distribution could occur through several means, including R&D product developer sponsored dissemination through targeted mailings. Distribution through a number of channels including dissemination of promotional materials, R&D product catalogs or conference presentations was necessary to obtain widespread acceptance. Typically, dissemination was the responsibility of the sponsoring agency since other users had few incentives to distribute R&D products beyond their organization. However, secondary distribution was measured when it occurred.

Implementation bridged the gap between learning about the innovation and trying it. The process of incorporating an innovation into an organization was very complex. Fullan and Pomfret (1977), in their review of curriculum implementation studies, identified the following factors influencing effective implementation:

(1) characteristics of the innovation, such as its complexity;

(2) strategies of implementation dealing with resource support, timing, and feedback mechanisms;

(3) characteristics of the adopting units, such as their demographics and ability to solve problems; and

(4) political characteristics of the adopting unit such as incentive systems, the role of evaluation, and political complexity.

Utilization of a R&D product must have occurred prior to evaluation of effects. An important concept analogous to utilization was sustained use. Causal models constructed by Crandall, Bauchner, Loucks and Schmidt (1982) showed that teacher commitment and elapsed time (i.e., the length of time the teacher has been using the innovation) were significant predictors of change in practice. There were several levels of use of an R&D product (Hall and Loucks, 1977). Only parts of a product may have been used or the product may have been used for only a short time period. Furthermore, a product may have been modified as it was used so that a fairly new innovation had evolved. These levels of use must be identified to determine the extent that impact could be attributed to use of the original R&D product or to modified R&D products.

The final stage of the conceptual framework was the effects stage. Measuring the effects of a R&D product constituted a search for visible changes as a result of use. Impact could have occurred in subtle and individualized ways or occurred for society as a whole. Certainly, individualized changes have been more readily measured than changes in society. Impact upon society has been extremely difficult to measure due to the inability to limit the benefits of a publicly developed and distributed R&D product to only certain members of society. Thus, the benefits have typically been so diverse and widely dispersed that they have been difficult to identify.

The R&D Product Impact Model and LISREL

Thus far, the conceptual framework has been developed based upon an extensive literature base, an impact evaluation data base, and the knowledge and expertise of an NCRVE evaluation team. In addition, the conceptual framework has been reviewed by other experts to establish content validity. Yet, an important question still remains, "how could the R&D conceptual framework be used to measure the impact of vocational education R&D products?"

The conceptual framework represented a general model identifying the criteria necessary to measure R&D product impact in diverse settings and with different types of products, programs and people. Yet, the conceptual framework contained a cumbersome number of criteria to build into an R&D product impact evaluation model. In addition, the proposed relationships among criteria and the formative and summative stages were untested.

In order to evaluate the conceptual framework and establish its utility for R&D product impact evaluation, a more parsimonious model was designed. The criteria which were addressed in the model were three formative criteria which were user orientation, support systems and integrated utilization; and two summative criteria which were user satisfaction and individual growth (Figure 3).

This model proposed that to the extent formative criteria had been met, there was increased likelihood users were satisfied with the product and individual growth had occurred. The model hypothesized the following relationships among criteria:

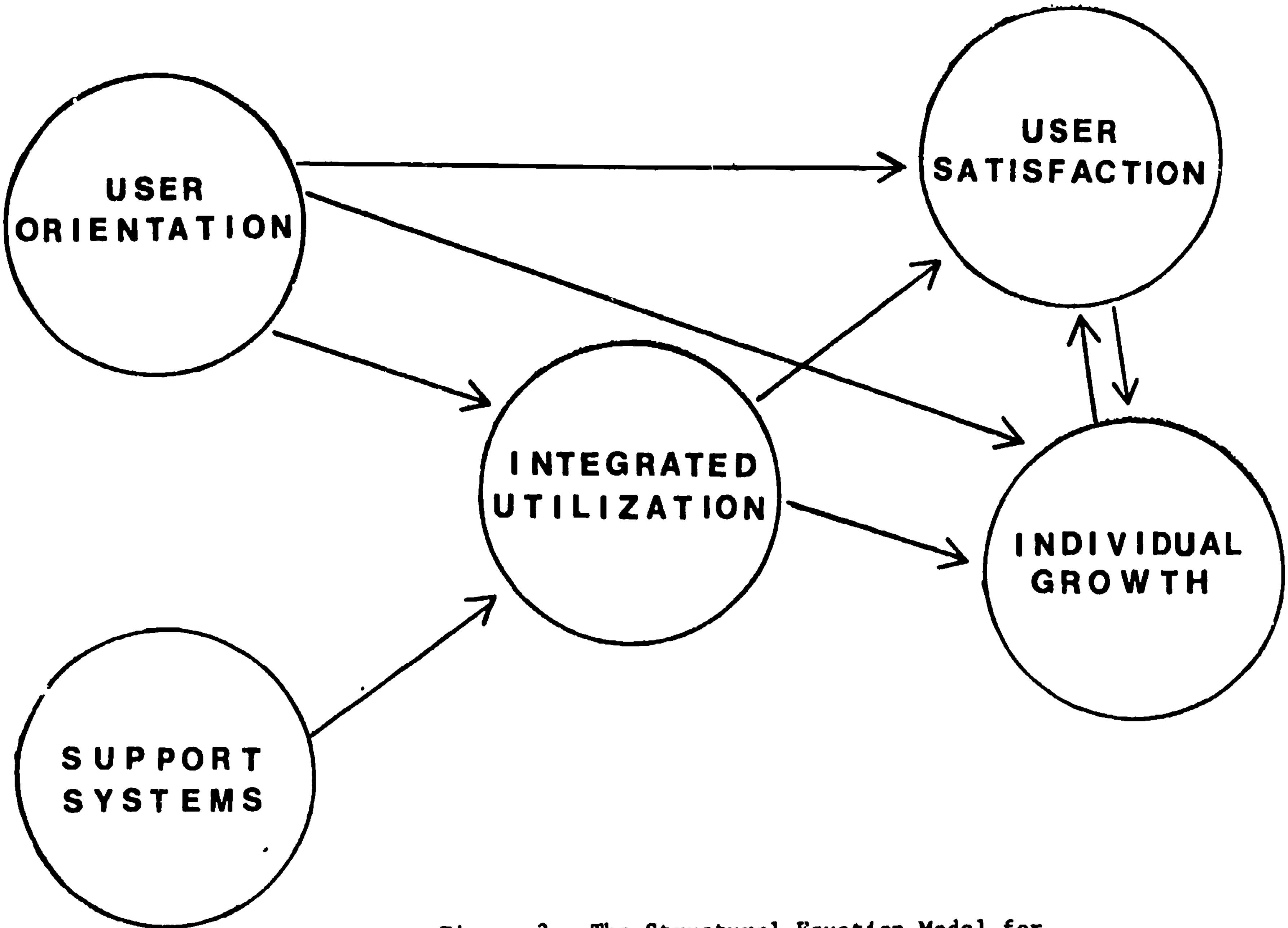

Figure 3. The Structural Equation Model for the R&D Product Impact Model

(1) The R&D product which was user oriented influenced user satisfaction and individual growth. In addition, user oriented R&D products influenced integrated utilization which, in turn, influenced user satisfaction and individual growth.

(2) Support systems influenced integrated utilization which, in turn, influenced user satisfaction and individual growth. Support systems did not directly influence user satisfaction and individual growth.

(3) User satisfaction influenced individual growth and individual growth influenced user satisfaction.

More specifically, the model hypothesized that the more R&D products were developed with the involvement of relevant user audiences through reviews and field testing, the more likely R&D products would be integrated into routine use within an organization and then influence the satisfication of users and change in user's knowledge, skills and/or attitudes. Previous research has supported this premise as well as other aspects of the model. Hood and Blackwell (1976) and Seiber (1981) found that products developed with input from local educators and products containing relevant information were more likely to be used. In addition, the more R&D products were user oriented, the more likely R&D products were to directly influence the satisfaction of users and directly influence individual growth.

Furthermore, the more support systems in the form of personnel, information and financial resources available when R&D products were implemented, the more likely R&D products would be used routinely within an organization and, in turn, influence the satisfaction of users and growth of knowledge, attitudes and/or skills of individuals. Support systems would not be expected to directly influence user satisfaction and individual growth. Support resources were important for implementation of a R&D product but not necessarily apparent when a R&D product was used. A R&D product user was satisfied or changed as a result of using the product, not by the support system. Berman and Pauly (1975) found that without support personnel and physical resources, teachers have frequently reported problems when implementing products. Berman and McLaughlin (1978) indicated the importance of support personnel as change agents to improve implementation.

Integrated utilization was the intensive and pervasive incorporation of R&D products into organizational routine. The more R&D products were integrated into use in an organization, the more R&D products would influence user satisfaction and individual growth. Crandall et al. (1982) described the importance of integrated utilization as evidenced by teacher commitment to a R&D product. Seiber (1981) described R&D product ownership as a powerful incentive for change.

Finally, an individual that was satisfied with a R&D product was more likely to experience growth in knowledge, attitudes and/or skills than a dissatisfied product user. Furthermore, when individuals experienced growth, they were likely to attribute that change to use of the R&D product and be satisfied.

A modeling approach, developed in recent years, known as structural equation modeling can be used to determine the degree to which the proposed model actually represented the R&D product impact phenomenon in the population. LISREL, an acronym for linear structural relationships, is a computer program developed by Joreskog during the 1970's to analyze structural equation models (Joreskog and Sorbum, 1983). LISREL has been praised highly by researchers and statisticians in the social science fields as a significant advancement which may enable researchers to study more complex phenomena than was previously possible.

LISREL is unique from other modeling approaches, such as path analysis, since it enables analysis of causal structure among hypothetical constructs, also referred to as latent variables. LISREL is based on maximum-likelihood statistical theory rather than the least squares statistical theory on which linear regression is based. However, like other modeling approaches, LISREL may be used to test causal linkages among variables by using data usually collected through non-experimental designs. The use of LISREL demands a priori theory regarding the relationships among variables. Based on theory, LISREL can test the causal linkages among latent and manifest variables. LISREL is predicated on a confirmatory approach and is definately not intended to be used in an exploratory manner! Without a priori theory, even though a model may have been tested and appeared tenable, a researcher can say little about the meaningfulness of the relationships among variables.

The model shown in figure 3 is referred to as the structural equation model. The one-way arrows between two variables in the model indicated a postulated direct influence of one variable on another. Unlike path analysis, LISREL can handle a nonrecursive model illustrated by the two arrows between user satisfaction and individual growth. This nonrecursive model implies user satisfaction directly influences individual growth and individual growth directly influences user satisfaction.

The structural equation model refers to relationships among exogenous and endogenous variables. The exogenous variables in this model were user orientation and support systems and the endogenous variables were integrated utilization, user satisfaction and individual growth. Exogenous variables are independent variables, or can be thought of as causes, and assumed to be determined by causes outside the model. In contrast, endogenous variables are explained by other exogenous or endogenous variables. These endogenous variables can be thought of as effects, or dependent variables.

As stated previously, LISREL has the capability of examining the relationships among latent variables, rather than only observed variables as occurs with path analysis. This second feature of LISREL allows the incorporation of the measurement model which specifies the relationships between latent and measured variabies, also referred to as manifest variables. The measurement model is comparable to common factor analysis. Figure 4 illustrates the incorporation of both the structural equation model and the measurement model. Latent variables are traditionally shown in circles while manifest variables are placed in boxes. The error terms corresponding to each manifest and latent variable have been ommitted so the model is easier to visualize.

Kerlinger (1979) pointed tc the need to utilize multiple indicators

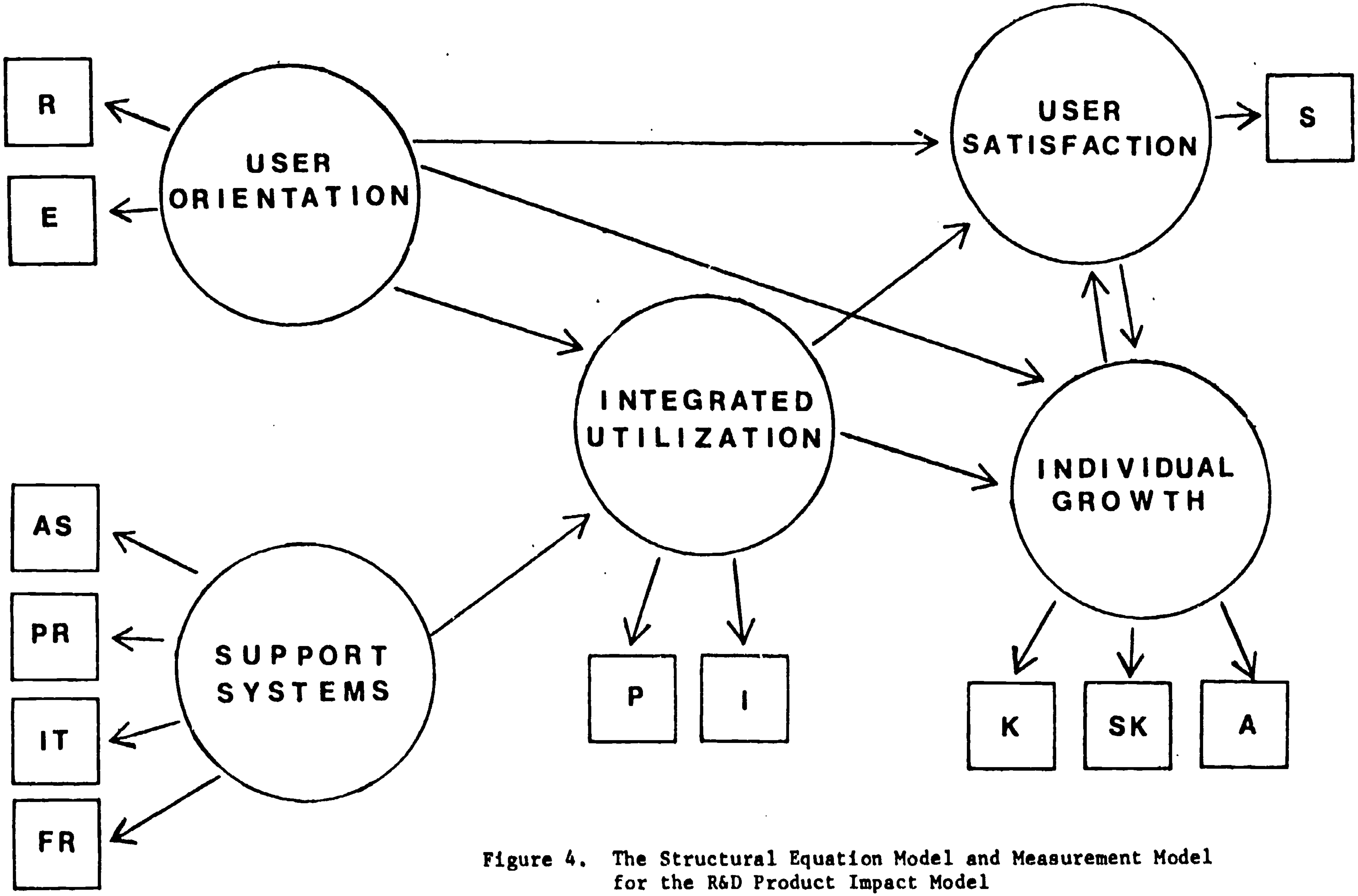

Figure 4. The Structural Equation Model and Measurement Model for the R&D Product Impact Model

to deal with reliability problems obtained during measurement. He continued by describing the complexity and indirect nature of many measurement procedures. Analytical approaches such as path analysis were limited since they did not possess the capability to incorporate multiple indicators or latent variables into the model. Most analytical approaches developed prior to LISREL assumed variables were measured without error. Pedhazer (1982) described measures in socal and behavior science as moderately reliable, at best. Furthermore, he explained that it was unrealistic to expect single indicators to capture the validity and reliability of the complex constructs typically studied in the social and behavioral sciences.

Certainly, given the complexity of measuring R&D product impact, there was a need to carefully plan indicators for each summative and formative criteria. By incorporating the use of multiple data sources, the following indicators were identified for each formative criterion. Two indicators were identified for user orientation which were relevance to the needs of the user and ease-of-use of the product. The four indicators of support systems were administrative support, physical resources, inservice training, and financial support. Two indicators were identified for integrated utilization which were the pervasiveness and intensity of use of the R&D product. The indicator of user satisfaction was an overall measure of satisfaction. Finally, based on the nature of the R&D product, a general assessment of the knowledge, skills or attitude was obtained.

Several of the indicators would be measured through surveys of R&D

product users. (Appendix B contains examples of survey items for the indicators of three latent variables.) For example, R&D product users could rate from poor to excellent the quality of the product on relevance and ease of use. A second example would be to obtain an estimate of R&D product users about the amount of time devoted to inservice training during implementation of the R&D product.

Once a theory has been developed, the structural equation model and measurement model have been specified, and data have been collected, the researcher is ready to analyze data. The data are input for analysis by LISREL in the form of a correlation or covariance matrix among all the manifest variables. In addition, the researcher specifies the relationships among variables for the structural equation model and measurement model through eight matrices, rather than entering the raw data as would occur when using other social science statistical packages such as SAS or SPSS. A basic understanding of matrix algebra is necessary to use LISREL. However, once matrix algebra has been mastered, LISREL represents a fairly simple analysis procedure to use.

The results of a LISREL analysis will give the researcher evidence of the fit of the model in the population and the fit of individual parameters. Each element entered into the eight matrices, representing the relationships among variables in the population, is a parameter. The test statistic for the overall model and parameters is chi-square. Chi-square is an extremely powerful test statistic for LISREL models, partly because of its relationship to sample size. As the sample size increases, chi-square is more likely to be significant and thus, the model is more likely to be rejected. So, since models are usually tested with large sample sizes, the models are usually rejected. Certainly, this is a sticky problem and researchers need to be aware of a number of other descriptive statistics, discussed by Bentler and Bonett (1980), to assess the fit of the model.

In summary, the R&D product impact model has illustrated the basic components of LISREL which were the structural equation model and the measurement model. Certainly, manifest variables were needed to deal with the error of measurement of the hypothetical constructs in the R&D product impact model such as user orientation and integrated utilization. LISREL, based on maximum-likelihood statistical theory, would be used to test the fit of the proposed model in the population, based on a sample of R&D product users. This paper has only touched upon the ways to use LISREL to test general models. For example, the R&D product impact model could be tested simultaneously with R&D product users representing different roles and organizations. However, caution has been made about the direct relationship between chi-square and sample size. A list of selected LISREL references has been provided for those researchers who are interested in pursuing LISREL in the future. In addition, the final section of this paper highlights some of the strengths and weaknesses of LISREL not previously discussed.

Strengths and Weaknesses of LISREL

LISREL possesses a number of features which bring enormous potential for analyzing other vocational education R&D phenomena. Some of the strengths of LISREL are:

(1) LISREL is a general modeling approach that can be used to do path analysis, multiple linear regression, common factor analysis as well as structural equation modeling.

(2) LISREL represents a confirmatory approach (i.e. hypothesis testing) and thus, represents a rigorous approach to model testing.

(3) LISREL allows the testing of general models to:
   (a) determine whether or not the models hold in the population,
   (b) compare the fit of a general model across different populations, and
   (c) determine the fit of competing general models.

(4) LISREL forces the researcher to think through the theory under investigation including the relationships among variables. When using LISREL it is equally as important to specify missing paths as to specify existing paths.

(5) LISREL can analyze models with correlated residuals (i.e. panel longitudinal data) and non-recursive models (i.e. user sa tisfaction and individual growth in the R&D product impact model).

(6) LISREL can analyze categorical and continuous exogenous variables enabling the researcher to collect data through qualitative and quantitative methods.

(7) General models can be modified, and the modifications tested, when the changes in the model are consistent with the a priori theory and are conducted in a systematic manner.

Some of the weaknesses of LISREL are the following:

(1) LISREL requires a very large sample size, however a large sample size virtually guarantees that the model will be rejected.

(2) LISREL can not analyze correlated relationships among endogenous variables, however LISREL can analyze correlation among exogenous variables. This restriction, however, limits the theories that can be tested with LISREL. A general model being developed by Bentler and Weeks will have the capability to analyze an even greater

variety of relationships among variables than LISREL (MacCallum, 1984).

(3) LISREL users must be very cautious when modifying models because modifications can easily bring about an exploratory rather than a confirmatory approach. When this occurs, inferential statistics can no longer be applied since the researcher may be captilizing on chance. The LISREL literature related to modification of models should be reviewed prior to attempting to modify a model.

(4) LISREL is expensive because of computer time and data collection with multiple indicators and large sample sizes.

(5) LISREL is not as user-friendly as other social science statistical packages such as SAS and SPSS. Error messages are not as explicit as those provided by SAS or SPSS. It is easy to unknowingly specify the elements in the eight matrices incorrectly and thus, test a different model than the researcher had intended.

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APPENDIX A

The Criteria Defined

Systematic development. A systematic process should be followed in developing R&D products. An ideal process would include conducting research and needs assessment/task analysis; reviewing relevant knowledge and practice; building a conceptual framework; sequencing development; conducting testing and revision cycles; disseminating the product; implementing the product; and evaluating the results.

High quality. Products should reflect scholarship, be useful, communicate clearly, be marketable, and be free of biases. Content should be accurate, up-to-date, focused on essentials, and complete.

User orientation. Representatives of relevant audiences should be identified and involved in designing, testing, and using innovations. Primary audiences should receive priority in dissemination efforts. The resulting product should contain practical information organized in an easy-to-use format.

Strategic distribution. Cost-effective strategies for distributing an R&D product should be devised on the basis of the characteristics of potential users, site-specific factors, and features of the product itself. Distribution should reach opinion leaders and influential organizations in the external environment.

Multiple channels. More than one channel for conveying information about products should be used. Communication should include mass media (e.g., brochures sent out by mail) and interpersonal channels (e.g., technical assistance). Normally, information duplication and overlap are assets rather than liabilities during the distribution stage.

Widespread distribution. Products should reach appropriate users. Thus, distribution to individuals in different roles, in diverse settings, and in many geographic areas may be necessary. Secondary distribution through workshops, reprints, libraries, the ERIC system, and so on should be encouraged.

Sequential implementation. The introduction of products should be sequenced to meet the needs and unique characteristics of an adopting site. Often potential users need to be introduced to segments of the product to avoid total rejection of the intervention.

Support systems. Support systems necessary for encouraging the full use of a product should be operational at the time of implementation. These systems are of three types: personal resources (e.g., administrative endorsement or site personnel endorsement), information resources (e.g., training in the use of support materials and procedures), and physical resources (e.g., dollars, supplies, and equipment).

Cost feasibility. Information describing the product's resource requirements should allow quick and easy estimates of the costs likely to be incurred by an adopting unit.

Multiple patterns of use. A product's use patterns will vary according to the conditions, intensity level, frequency, and extent of use. The users' setting, role, and demographic characteristics create the conditions for different types of use. Multiple patterns of use and secondary use of R&D by other than the primary user audience should be encouraged.

Time on task. An R&D product should be used frequently enough and long enough for its use to become an integral part of current practice. The audience's time in actually using the product should be maximized.

Integrated use. Use of a product should be intensive and pervasive throughout the organization. To accomplish this goal, personal commitment is required within the organization at all levels to institutionalize the product into organizational routines.

User satisfaction. The R&D product and its implementation should meet users' expectations and result in a positive user attitude toward the product. User satisfaction may be indicated by product advocacy or by creative adaptations.

Individual growth. Products should contribute to changes in an individual's attitude, knowledge, or performance.

Organizational change. R&D products should contribute to beneficial changes in the user's organizational policy, programs, practices, or structure. Beneficial changes may also include cost and time savings over current practice.

Societal contributions. R&D products should contribute new and significant information with the potential to advance knowledge, improve current practice, or influence social systems.

APPENDIX B*

User Orientation

How would you rate the quality of the innovation on the following criteria? (One rating per criteria.)

Criteria	Not Applicable	Poor	Fair	Good	Very Good	Excellent
Relevance to my needs	0	1	2	3	4	5
Ease of use	0	1	2	3	4	5

Support Systems

To what extent were adequate support systems available for implementing the innovation?

	ADEQUACY				
TYPE OF SUPPORT	Not at All		To Some Extent		To a Great Extent
Administrative endorsement	1	2	3	4	5
Personnel involved	1	2	3	4	5
Support material	1	2	3	4	5
Training	1	2	3	4	5
Funds	1	2	3	4	5
Equipment	1	2	3	4	5
Supplies	1	2	3	4	5

Pervasiveness/Integrated Utilization

Record the amount of classroom time (in person-days, 8 hours = 1 day) you spent actually using different sections of the innovation during the past year.

	Jan. 1 - March 31	April 1 - June 30	July 1 - Sept. 30	Oct. 1 - Dec. 31	TOTAL PERSON-DAYS
Section I					
Section II					
•					
Section N					

* See Hull, Adams and Bragg (1983) for additional survey items.