Measuring Implementation in Schools:
LEVELS OF USE

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Acknowledgments

We would like to acknowledge the assistance of several of our colleagues in the Concerns-Based Adoption Model Project in the 1970s: Beulah Newlove, who contributed significantly to the development of the Levels of Use interview procedure; the late Bill Rutherford, an author of the original manual; and the late Susan Loucks-Horsley, who provided valuable content and spent many hours conducting LoU interviews and analyzing the data.

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Foreword

SEDL is pleased to publish a reprint of the manuals describing the use of the three dimensions of the Concerns-Based Adoption Model (CBAM). All three manuals have been updated and given a new title. Each manual will be available individually, but also as a set under the title *Measuring Implementation in Schools: Using the Tools of the Concerns-Based Adoption Model.*

The title of this series may appear at first to be a misnomer. How does one "measure implementation"? Implementation is a complex process or set of processes. Researchers have proposed many models and explanations of the implementation process based on variables such as the nature of the understanding and autonomy of the implementing individuals—their capacity or their will to make changes. Other explanations focus on the clarity with which the reform policy describes outcomes, processes, and consequences. All of these models attempt to portray what accounts for successes and failures during the process of policy implementation such as standards-based education reforms.

Measuring the process of implementation is tantamount to measuring a journey. Indeed, the developers of the Concerns-Based Adoption Model have compared implementation to a journey across a chasm. In change implementation, there is a chasm between adoption of new practices and their implementation which will result in improved student outcomes. It is impossible for teachers to make a leap across the chasm; instead there is an implementation bridge, which is crossed as practice is changed and reforms are implemented. An implementation researcher certainly can't measure the journey across the bridge. But one can measure many things related to that journey: the distance from one bank to the other, the length of the bridge, and the number of steps and time it takes to reach the peak of the bridge or to cross the bridge. An evaluator can estimate how many people are needed to take the journey; she can describe how they organize to pack, navigate and choose the route, correct their course, and complete the journey. And in the end, the measurements will help us see what happened during the course of the journey; we can understand how we came to begin and complete the journey and arrive where we planned.

If "implementation as a journey" is a metaphor, the notion of taking measure of aspects of that journey is an extension of that conceptual metaphor. It reminds us of some important qualities of the process of implementing educational change: it is dynamic, it is difficult, its success or failure is affected by many interdependent factors and variables, many of which we still know little about. And it provides the framework in which to consider some of the tools we might take to make that journey more memorable and productive. The various dimensions of the Concerns-Based Adoption Model (CBAM) provide some of those tools.

Scope of the Revision of the CBAM Manuals

Purpose and Intended Audiences

The CBAM conceptual framework, data collection tools, and model for considering implementation are among the most important contributions to research on the process of change in education in the past 30 years. During those years, observers of school improvement have documented movements from "effective schools," to "school restructuring," to "systemic reform," to "standards-based reform and accountability." How we think about implementation has also evolved from thinking about the success of an implementation process as a function of one teacher and one curriculum, to thinking about it as a function of an instructional group—a team or a faculty. Though CBAM was developed during an era when introducing single innovations was a prevalent way to improve teaching and learning, the model continues to inform education reform today. The refined CBAM manuals accomplish the following: (a) present the constructs of the model; (b) update the knowledge base; and (c) support appropriate applications of the CBAM through appropriate use of the CBAM tools to assess the implementation of innovations in school settings.

The new generation of CBAM materials is aimed primarily at researchers charged with measuring the implementation of a new practice or innovation in a school setting. By "researchers" we mean university researchers, program evaluators, and change facilitators who are gathering data to assess, describe, evaluate, or monitor the implementation of change. Evaluators, administrators, and other staff members can use the CBAM tools formatively to track how they are implementing particular reform initiatives.

Implementation researchers may also use the CBAM tools to build knowledge about how teachers make sense of reform policies and resulting innovations. Reviewing data gathered using all three tools helps them add to the implementation literature to refine what is known about how teachers' cognition, affect, and sense of their situation helps them make sense of and interpret policy reforms. Their ability to do that sense making is critical to their implementation of an instructional innovation. The CBAM tools used in an integrative way can help researchers add to the implementation knowledge base.

A third audience includes administrators, teachers, and change leaders who are charged with implementing and sustaining change in a school or across a district. Faculty and other staff members can use the CBAM tools to clarify the components of complex reforms. Administrators can use them to collect data that will help them determine what modifications to make or what types of support they need to provide—more resources, professional development for teachers, or tutoring for students—to improve and sustain implementation of a standards-based reform.

Parameters of the Updates

The principal authors, who were among the original CBAM developers, identified the following parameters for refining the selected materials in each volume: (a) incorporate most recent advances in methodologies; (b) use approachable, accessible language that represents the depth and rigor of the

knowledge base about CBAM for an evaluation audience yet is instructional for the practitioner user; (c) explicitly discuss the strengths and limitations of the updates of this version, especially in discussion of most recent statistical analyses; (d) update literature review for each construct and include explicit descriptions of research design, methodologies, and source and year of publication; and (e) include recent examples of application of the model or one of the CBAM tools, focusing especially on assessing the progress of implementation processes.

Structure of Volumes

Each of the three CBAM dimensions is described in a separate volume, *Measuring Implementation in Schools: The Stages of Concern Questionnaire; Measuring Implementation in Schools: Levels of Use;* and *Measuring Implementation in Schools: Innovation Configurations.* The three volumes contain similar or redundant information so that each volume can stand alone as a CBAM reference. All three volumes are structured as follows:

Foreword
Preface
Introduction
  Describe CBAM constructs
  Describe relationship of the tools to each other
Example applications and scoring measures
Literature review
  Narrative
  Summary chart: author/reference/findings
Resources
References

Each CBAM dimension has a unique tool, with specific traits and strengths as a tool. The Stages of Concern (SoC) Questionnaire is a quantitative instrument that measures what a teacher or user is feeling about an innovation. The Levels of Use (LoU) Interview is a focused interview protocol that measures teachers' actions in eight behavioral profiles along a continuum of use. The Innovation Configurations (IC) Map is a verbal description of the components of an innovation; it describes what individuals will be doing as they are implementing each component, with variations of practice from poor to ideal. Likewise, each volume has its own particular characteristics, modifications to the structure, and specific resources.

Finally, a supplemental resource in video format is available on the SEDL website at www.sedl.org/cbam/videos/cgi? The video includes an overview of the CBAM constructs as they may be applied to assessment of implementation of standards-based reform and accountability initiatives. The video features interviews with Dr. Gene Hall, Dr. Shirley Hord, and Dr. Archie George, three of the original CBAM developers and principal authors of this revised series.

SEDL appreciates the support of the Institute of Education Sciences for this revision of CBAM tools. We are also grateful for the assistance and support of our colleagues who reviewed drafts of these manuals: David Marsh, University of Southern California; Kay Persichitte, University of Wyoming; Sharon Boutwell, Spring Branch ISD; and D'Ette Cowan, Ann Neeley, and Ed Tobia, SEDL. Our expectation is that evaluators, researchers, and practitioners will use the new generation of CBAM manuals to assess the implementation of reform initiatives with the goal of improving education for all learners.

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SEDL

October 2005

Preface

The Concerns-Based Adoption Model (CBAM) was developed in the 1970s at the University of Texas's Research and Development Center for Teacher Education. The founding construct in the CBAM, as is reflected in the model's name, was Stages of Concern About an Innovation. The CBAM research team drew on Frances Fuller's seminal work studying teacher-education students' concerns about teaching. Based on my work as an external change agent and my observations and reflections recorded in field notes, it was a logical extrapolation to hypothesize that a similar concerns dynamic was present for people experiencing change. This hypothesis led to the now well-established CBAM diagnostic dimension called the Stages of Concern (SoC) About an Innovation.

The Levels of Use (LoU) diagnostic dimension emerged directly from my life experiences, and again from my fieldwork and notes. I credit Dick Wallace and Bill Dossett with having had the skills and persistence to pull the LoU ideas out of my head. As a result, in the original statement of the Concerns-Based Adoption Model (CBAM) (Hall, Wallace, & Dossett, 1973), SoC and LoU were proposed as the original two diagnostic dimensions of the model.

In the early 1970s, we were fortunate to obtain financial support and substantive guidance from the professionals in the then U.S. Office of Education and later National Institute of Education to conduct a set of 2-year verification studies. The study questions were as follows:

1. Does the Stages of Concern About an Innovation construct exist, and can it be measured?
2. Does the Levels of Use of the Innovation construct exist, and can it be measured?
3. What are the relationships between SoC and LoU?

The CBAM research team, which included Archie George, Shirley Hord, Leslie Huling, Susan Loucks, Beulah Newlove, William Rutherford, Suzanne Stiegelbauer, several graduate students, and me, worked long and hard to develop prototype measures and to design a set of longitudinal studies, with cross-sectional samples, to answer the study questions.

As each of us returned from the first data collection trips, we emphatically pointed out a new problem. People in different settings would say that they were using the innovation, but this was true in name only. In each school or university (we conducted studies in both contexts), the operational form of the innovation was significantly different. For example, what was being done under the name of team teaching in Plano, Texas, was different than what was being done in Lincoln, Nebraska, and both of these forms differed from what teachers were doing as teaming in eastern Massachusetts. These observations led to the establishment of the third CBAM diagnostic dimension—Innovation Configurations (IC).

Each CBAM diagnostic dimension was carefully defined, and purposefully built measurement procedures were established. Each has been the subject of verification studies and now is widely used in implementation assessment, evaluation, research, professional development, and change facilitation applications. Also, each diagnostic dimension has been applied in many types of settings and in many countries.

This is one of three manuals—for SoC, LoU, and IC—updated by SEDL. The manuals provide the basic information needed to use each diagnostic dimension. The constructs are defined, the measurement methodologies described, and examples of appropriate applications presented. However, prospective users of these diagnostic dimensions must assume responsibility for learning more about the Concerns-Based Adoption Model and its dimensions, going beyond the quick survey included in each of the manuals (see Hall & Hord, 1987, 2001, 2006, for more in-depth discussions of CBAM). As one of our colleagues in the New Mexico Department of Education observed about Stages of Concern: "CBAM constructs are deceptively simple. It is like an onion where you can understand it at one level and when you peel off the outer layer there is more to learn and understand inside." For this reason, we ask that you contact the authors or SEDL to learn about becoming qualified to use one or more of the CBAM diagnostic dimensions. You will find that we are very willing to be of assistance. This is the only way that all of us can be assured that the data collected by others are reliable and valid and that the interpretations are accurate.

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October 2005

Chapter One
Introduction to the Concerns-Based Adoption Model and the Levels of Use

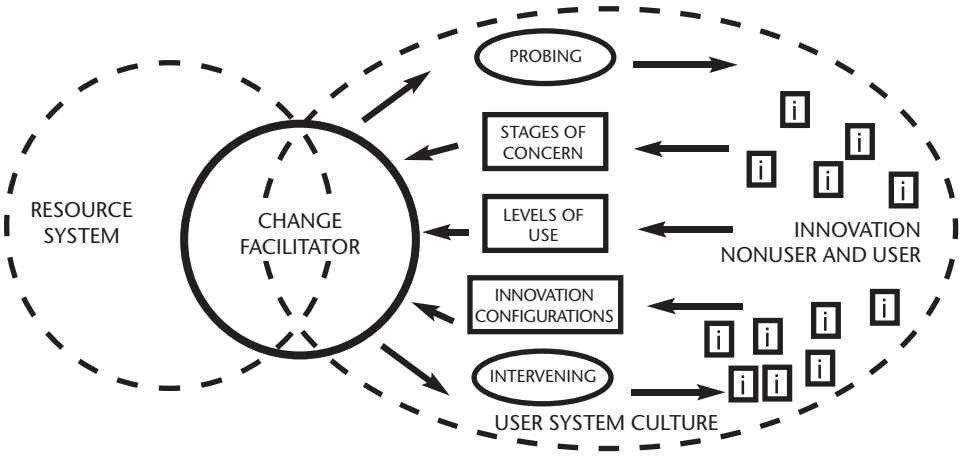
The Levels of Use (LoU) is one of three diagnostic dimensions of the Concerns-Based Adoption Model (CBAM). The CBAM evolved out of the work of Frances Fuller (1969) and others in response to the innovation focus approach to educational change common in the diffusion and adoption era of the 1960s and 1970s. Within this conception of a school change process, best practice was presented in terms of discrete innovations or programs, usually developed by an external source and presented to teachers and schools as a packaged product. Theoretically, teachers had to just adopt the innovation (whether it was a product, curriculum, set of strategies, or entire program that included multiple innovations) to achieve the desired outcome promoted by the developer(s) of the innovation.* Needless to say, in most cases the promised outcomes did not occur, at least not in the same way they did at the original site of development of the innovation.

Staff at the Research and Development Center for Teacher Education (R&DCTE) at the University of Texas at Austin began to investigate what happened when individuals were asked to change their practices or adopt an innovation. This research resulted in the Concerns-Based Adoption Model (Hall, Wallace, & Dossett, 1973) and further development of its diagnostic dimensions. The CBAM research team believed that change begins with the individual, usually the teacher or faculty member, and focused its early efforts on understanding what happens to teachers and university faculty when presented with a change. The model is a framework designed to help change facilitators identify the special needs of individuals involved in the change process and address those needs appropriately based on the information gathered through the model's diagnostic dimensions. It also provides researchers and evaluators with constructs and tools for measuring the extent of implementation.

Stages of Concern (SoC), as it evolved, became the hallmark of CBAM work. It provided a framework for understanding the personal side of the change process from the individual's point of view. The other diagnostic dimensions of CBAM—Levels of Use and Innovation Configurations—emerged developmentally as ongoing research was conducted on the change and adoption process (Hord, Rutherford, Huling, & Hall, 1987). Whereas SoC addresses the affective aspects of change, such as people's reactions, feelings, perceptions, and attitudes, LoU focuses on behaviors and shows how users are acting with respect to a specific change. Together, the SoC and LoU provide a powerful description of the dynamics of an individual involved in change, one dimension focusing on feelings, the other on behaviors. Each member of an organization will have his or her own Stages of Concern about and Level of Use of a particular innovation. Innovation Configurations (IC) does not focus on the individual; rather it addresses what the innovation or change actually looks like as it is made operational by each implementer.

* Note that throughout the manual, the term *innovation* is used. This term was selected to represent whatever change or reform is being implemented.

Figure 1.1. The Concerns-Based Adoption Model



The CBAM and the Current Era of Reform and Accountability

Current uses of the CBAM model are as diverse as are the innovations to which its parts might be applied. The foundational development period for CBAM materials, based on research and testing applications, occurred from the mid-1970s to the mid-1980s, ending when the Research and Development Center for Teacher Education was closed and the core research team moved on to other research and academic organizations. During this early phase of active development of CBAM materials, an international cadre of CBAM practitioners and researchers emerged. These practitioners became trained in the model and disseminated it to a range of school, organizational, and university settings. As a result, CBAM tools have been commonly used in federally sponsored research projects, dissertation research, evaluations, and change programs.

Since the initial development of CBAM, our conception of school reform has evolved from the diffusion and adoption era to one of systemic reform. The earlier era presented best practice in terms of discrete innovations or programs developed by an external source and presented to teachers as a packaged product. The movement toward systemic reform was strengthened in 2001 when the national agenda—as reauthorized in the Elementary and Secondary Education Act, or the No Child Left Behind Act—mandated a range of policy strategies. These included a focus on high academic standards and standards-based assessments, school choice, strong charter school laws, improvement of teacher content knowledge and certification, higher pay for teachers, more funding for instruction, and increased level of parent involvement in schools.

While the policy intent was to give autonomy to the states, districts, and schools, the federal government prescribed accountability measures—including standardized testing and consequences for failing to make Adequate Yearly Progress, for example. The components of this new accountability include the tenets of standards-based reform.

Due to this evolution of systemic reform, improvement is no longer viewed as the introduction of a single innovation as it was when CBAM was developed. Innovations are more complex, with multiple components, and include reform programs that span schools, districts, and even entire states.

Instituting more complex reforms at multiple levels means that local implementation of education reform often is more difficult than it was in the past. However, the teacher's role in implementing reform is still key. Though researchers have deepened the knowledge base of reform implementation over the past 30 years, much is still unknown about how an implementing teacher understands or interprets a policy (Spillane, Reiser, & Reimer, 2002). The individual's own cognition, beliefs, and context or social situation all contribute to an ability to make sense of a policy. Teachers and administrators must be able to understand what is expected of them and they must be able to envision what standards look like in their classrooms. They must consistently make best and highest use of the instructional strategies and assessments to sustain these reforms for improved student and system performance. Even whole-school reform efforts will fail to produce results if the individual teachers do not implement the expected practices. Evaluators, researchers, facilitators, or school administrators who are charged with monitoring the implementation of standards-based reforms also need tools that will help them define the components of complex initiatives. For these reasons, the Concerns-Based Adoption Model, with its focus on the individual and on the innovations being implemented, continues to be a useful tool in measuring implementation.

The CBAM dimensions—SoC, LoU, and IC—give evaluators, researchers, and administrators flexible tools they can use to begin to assess, monitor, and better understand aspects of the implementation process. The CBAM dimensions are interrelated in that they describe affective and behavioral domains. District or school staff members charged with monitoring implementation can use the CBAM tools, such as Innovation Configurations, to begin to construct scales by which they can determine what is measurable within a single reform that has many variations, such as a statewide reading program. They can use Levels of Use and IC to develop logic maps to clarify the goals, outcomes, and impacts of an approach, program, or strategy. Change leaders can use the tools to monitor and facilitate change, while administrators and their staff members can use the CBAM tools formatively to generate data and information they can analyze to make modifications that support the implementation and sustainability of an instructional reform.

Levels of Use in Research and Evaluation Studies

Like the other dimensions of CBAM, Levels of Use continues to be a critical variable in research and evaluation studies. A component of research methodology that has been somewhat neglected is understanding and systematically addressing the importance of documenting the extent of implementation. If the new package, instructional strategy, schoolwide reform, or technology has not been implemented, then the expected increases in student outcomes are not likely to occur. All too often it appears that researchers and evaluators have paid limited attention to implementation. They have rigor and precision

in measuring student outcomes while trusting sampling designs to control for implementation.

The failure to document the extent of implementation at the individual level places great risk on any study, no matter how well designed. As discussed in Chapter 5, CBAM studies consistently document the necessity of measuring the extent of implementation in both treatment and control/comparison groups. These studies regularly document that both groups will be composed of significant proportions of users and nonusers. Without knowing this, many studies conclude with the finding of "no significant differences" when in fact there are favorable differences that are masked by the heterogeneity of the two groups.

At the most basic level, researchers need to know if each individual identified in the treatment group is in fact using the program, practice, or strategy. They need to be equally certain that individuals in the comparison or control group are not using the treatment. There is great risk in assuming that group assignment, presence or absence of participation in training, or provision of materials equates to use/nonuse. Levels of Use studies over the last 30 years have regularly documented that the assumption of use/nonuse does not hold up. Both groups typically will have a mix of users and nonusers. The validity of this important assumption should not be left to chance. Use/nonuse must be determined for each individual within each treatment or control group. The LoU construct provides the conceptual tool for examining the use/nonuse question. The construct is generic in that it does not have to be redefined for different innovations and can be used in organizations other than schools and school districts. Thus Levels of Use can be used to assess use/nonuse with teachers, assembly line workers, teams, and whole organizations. The Level definitions stay the same.

LoU offers important information for researchers and evaluators in another way. Traditionally, using a program or practice has been viewed as dichotomous. The teacher either uses the approach or does not. As is explicit in the name and as will be explained in this manual, Levels of Use breaks use and nonuse into several levels. There are a number of important implications for research and evaluation studies from viewing use in terms of levels—one of the most important being related to LoU III Mechanical Use. All too frequently, summative evaluation studies are conducted with first-time users of the innovation. LoU studies regularly document that most first-time users will be at LoU III Mechanical Use. These individuals are disjointed in their use, have a short-term focus to their planning, and cannot predict the typical mistakes that their students will make. When LoU is considered in summative studies, it becomes clear that LoU III Mechanical Use individuals should not be included. Only higher levels should be included to determine the effectiveness of an innovation. This important implication for researchers and evaluators will be made clearer upon reading further in this manual.

Chapter Two
Description of the Levels of Use

As described in the previous chapter, Levels of Use is a behavioral phenomenon. It does not deal with attitudes, emotions, or feelings. It also does not deal with the quality of the innovation. Instead, LoU presents behavioral profiles of eight different approaches to using an innovation. The focus is on what an individual or group is doing or not doing. Each profile describes a very different set of actions and related understandings about the innovation and its use. Because LoU is based on behavior, it has been possible to develop operational definitions of

Table 2.1. Levels of Use of the Innovation

0	Nonuse: State in which the user has little or no knowledge of the innovation, has no involvement with the innovation, and is doing nothing toward becoming involved.
I	Orientation: State in which the user has acquired or is acquiring information about the innovation and/or has explored or is exploring its value orientation and its demands upon the user and the user system.
II	Preparation: State in which the user is preparing for first use of the innovation.
III	Mechanical Use: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.
IVA	Routine: Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.
IVB	Refinement: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.
V	Integration: State in which the user is combining own efforts to use the innovation with the related activities of colleagues to achieve a collective effect on clients within their common sphere of influence.
VI	Renewal: State in which the user reevaluates the quality of use of the innovation, seeks major modifications or alternatives to the present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.

each Level. This is one of the few times when it is not only possible but important to define the phenomenon in behavioral terms. The overall definition is as follows:

> Levels of Use are distinct states that represent observably different types of behavior and patterns of innovation use as exhibited by individuals and groups. These Levels characterize a user's development in acquiring new skills and varying use of the innovation. Each Level encompasses a range of behaviors.

Just as the overall definition has been stated in terms of behaviors, so is each Level. The operational definitions of each Level are presented in Table 2.1. Note that each description addresses behaviors and approaches that can be observed. It is imperative that in working with LoU there is no mention of the emotional or affective aspects of change. That is the function of the Stages of Concern diagnostic dimension, which is discussed fully in *Measuring Implementation in Schools: The Stages of Concern Questionnaire* (2006).

LoU Decision Points

Another important step in the development of the definitions of LoU was to define the Decision Points that distinguish each Level (see Table 2.2). Each LoU is conceived as independent of the others. Although the Levels appear to be logically sequenced, each must be viewed as discrete and independent. Each Decision Point provides a primary behavioral indicator that is unique to one LoU. Comparing behaviors to the Decision Points provides a direct way to describe and determine each of the Levels. The Decision Points also become the primary guide to the sequence and flow of the LoU interview.

In short, each Decision Point identifies a key behavior distinguishing that LoU from the others. The Level definitions and Decision Points make it possible to clearly distinguish each behavioral profile or categorical pattern of use.

It may seem odd that there are two LoU IV designations. In the original hypothesized presentation of LoU (Hall, Wallace, & Dossett, 1973), one Level IV, called "Independent," was described. When the verification studies were launched, the researchers returned from the first round of interviewing and reported that there were a number of individuals beyond LoU III but they were not making client-oriented changes. At that point, the interview protocol was standardized, so we decided to split Level IV into IVA Routine and IVB Refinement. We now know that in stratified samples of users, the biggest proportion will likely be at LoU IVA Routine.

Each of the Levels of Use and Decision Points will be discussed in more detail in the section "Rating Overall Level of Use," which begins on page 11.

LoU Categories

Once the definitions of each LoU emerged, the CBAM research team was confronted with a major dilemma: We had to develop a measurement procedure. It seemed this should have been easy, because we had operational definitions. The problem was complicated, however, because each LoU represented a profile or cumulative pattern of actions. Another problem was that the Level definitions would

Table 2.2. Levels of Use of the Innovation With Decision Points

LoU 0 Nonuse: State in which the user has little or no knowledge of the innovation, has no involvement with the innovation, and is doing nothing toward becoming involved.
Decision Point A: Takes action to learn more detailed information about the innovation.
LoU I Orientation: State in which the user has acquired or is acquiring information about the innovation and/or has explored or is exploring its value orientation and its demands upon the user and the user system.
Decision Point B: Makes a decision to use the innovation by establishing a time to begin.
LoU II Preparation: State in which the user is preparing for first use of the innovation.
Decision Point C: Makes user-oriented changes.
LoU III Mechanical Use: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.
Decision Point D-1: Establishes a routine pattern of use.
LoU IVA Routine: Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.
Decision Point D-2: Changes use of the innovation in order to increase client outcomes, based on formal or informal evaluation.
LoU IVB Refinement: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.
Decision Point E: Initiates changes in use of the innovation for the benefit of clients, based on input from and in coordination with colleagues.
LoU V Integration: State in which the user is combining own efforts to use the innovation with the related activities of colleagues to achieve a collective effect on clients within their common sphere of influence.
Decision Point F: Begins exploring alternatives or major modifications to the innovation presently in use.
LoU VI Renewal: State in which the user reevaluates the quality of use of the innovation, seeks major modifications or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.

provide us with only one data point: the overall Level. For reliability estimates, subpoints that would be indicative of each Level were needed.

The CBAM team also became aware of the importance of understanding that LoU is not limited to those moments of the day when the individual is operating the innovation. Much of use is consumed in preparation, planning, and reflection after use. For example, use behaviors of a teacher who is implementing a new instructional strategy are not limited to the part of the class day when the lesson is delivered to students. Preparatory work includes studying the instructor's guide, developing the lesson plan, organizing the required materials, perhaps practicing what the students will do, and anticipating what will happen as the lesson unfolds. There also are the post-lesson pickup, review, and planning for the next lesson. All of these out-of-classroom behaviors are part of using the innovation and addressed in Levels of Use.

To determine subpoints that would reflect each LoU, the CBAM team brainstormed a list of behavioral indicators. Once we had a large list of possible indicators, the whole team rated each in terms of the Level it would indicate. In the end we had identified and reliably agreed on more than 800 indicators. This caused another problem: There were too many indicators of each Level to use at any one time.

We studied the hundreds of indicators and explored different ways of grouping them. The breakthrough was to classify the indicators into seven Categories:

- Knowledge
- Acquiring Information

LoU in the Field

The following descriptions provide brief examples of teacher behavior at each Level of Use in the implementation of interim assessments in literacy:

LoU 0 Nonuse: When asked, Mary states that she does not know anything about interim assessments. She has not talked with anyone about it/them and has no plans to do so. Yes, it was mentioned at a faculty meeting, but she didn't pay any attention.

LoU I Orientation: Jose attended a workshop on the importance of using interim assessments. He has not decided to include interim assessments in his teaching, but he is thinking about it. He has talked with his department chair and one of his colleagues.

LoU II Preparation: In Betsey's school the principal has decided that all teachers will do interim assessments. Betsey has bought two books about interim assessments and found several useful sites on the Web. These sites have provided several assessments that she thinks she can use. They have helped her prepare to start using interim assessments next term.

LoU III Mechanical Use: Greg is spending at least 2 hours every weekend developing interim assessments to use in the coming week. Some of his assessments have worked, but several have been confusing to his students. He has had to rework those plus build the new ones for the subsequent week. He also developed some that he never had time to use.

LoU IVA Routine: Adele is using interim assessments the same way this year that she did last year. She has a bank of them and can pull out the most appropriate ones to use as she goes along. She sees them as important to knowing what her students understand. She finds that her assessments correlate well with how her students do on the state tests.

LoU IVB Refinement: Jeff has compiled the data from the assessments that he used last term. He sees that some of his students consistently perform lower, but he believes they really have learned the material. As he has checked into it, he has seen a pattern: those students who do not read as well are not performing as well on his interim assessments. He now is going to develop and try some assessments that do not rely on reading.

LoU V Integration: In the fall Fran and Joan decided to use the same interim assessments with their freshman English classes. They are now able to compare how well students are learning the benchmarks. Fran's students were not doing as well as Joan's in two areas. So this term she is using Joan's lesson plans to see if her students will do better.

LoU VI Renewal: Chancellor has used interim assessments and found that they really help with student understanding and his knowing how each student is progressing. Now he is looking into a computerized system that will administer the tests, keep each student's record, and compile a class profile.

- Sharing
- Assessing
- Planning
- Status Reporting
- Performing

These provided seven subpoints for rating each LoU, with example indicators of each. Curiously, all but one of the Categories deals with observable behaviors. The Knowledge Category is different, in that it deals with understanding about the innovation, how to use it, and its effects.

The Categories represent subparts of each LoU. In total they define each LoU. In addition to representing more detailed description of a part of LoU, they make it possible to have multiple data points for determining LoU. Each category can be rated separately and then the combinations of ratings can be used to determine the overall LoU. It needs to be noted, however, that determining the overall LoU is not done by simply adding or averaging the Category ratings. The overall assessment is determined through a holistic view of the Categories along with full consideration of rating of behaviors that are indicative of a certain Decision Point.

The Categories are discussed briefly in the next section. See appendix C for a more in-depth description of the Categories at each Level of Use.

The LoU Chart

The definitions of each Level, the Decision Points, and the Categories provide a comprehensive operational definition of Levels of Use. We combined these into one large table that has come to be known as "The LoU Chart" (see the

chart on pages 72-73, titled "Appendix E: The Levels of Use (LoU) of the Innovation." Once the Levels, Decision Points, and Categories are understood, the key to understanding and determining a rating is the description that occurs at each of the Level and Category intersections in the LoU Chart.

For example, the cell at the intersection of LoU IVB Refinement and the Knowledge Category states:

> Knows cognitive and affective effects of the innovation on clients and ways for increasing impact on clients.

Applying this description to using a standards-based education approach would mean that the teacher could describe what his/her students have been learning using the standards and benchmarks. The teacher also could describe the types of student learning that would result from using different instructional strategies. The Knowledge Category does not describe what the person is doing; rather, it focuses on the amount and types of knowledge and understanding about the innovation.

As another example, the intersection of LoU I Orientation and the Planning Category states:

> Plans to gather necessary information and resources as needed to make a decision for or against use of the innovation.

This person has not made a decision to use the innovation (Decision Point B), but is considering use and planning to look for information.

The behaviors that are described at each intersection in the LoU Chart are derived by combining the description of a Category, a Level, and the related Decision Point. In total, the LoU Chart describes eight patterns, i.e., levels, of behavior that can be identified, described, and reliably measured. Each LoU represents a different approach to using an innovation.

Again, each LoU can be described in terms of the types of behaviors represented at the intersections in the chart of each Category with a particular Level. For example, at the intersection of the Planning Category and LoU III Mechanical Use, individuals will be organizing for tomorrow and have few ideas about what will happen farther out in time. The changes they are making will be based primarily on their needs (Decision Point C), rather than on what will increase client outcomes (Decision Point D-2). As another example, a user at LoU V Integration will be making plans to coordinate his or her use with a colleague user in order to increase student outcomes.

Although there is a logic to the Category definitions across a Level, it should not be assumed that each individual will be rated straight across a Level. We regularly observe that individuals will have a preponderance of ratings at one Level, but will vary in some of the Categories. This pattern provides useful diagnostic information for those responsible for facilitating implementation. For example, an individual who is rated LoU IVA Routine overall, but is rated IVB in Assessing and Planning, is likely getting ready to make some sort of student-oriented change in the use of the innovation. This could mean that certain types of resources or training needs can be anticipated. Noting these Category variations in an evaluation report could be very helpful to staff developers or administrators as they plan their next steps.

The LoU construct has a number of other interesting elements. For example, only the Performing Category describes direct use of the innovation. All of the other Categories describe behaviors that are a part of using an innovation but mainly occur outside the moments of actual performance. This idea has important implications not only for assessing implementation, but also for training and coaching. For example, the content for professional development could focus on the logistics of "planning" for use with the LoU III user, or on the methods of assessing student learning for the LoU IVB user.

One of the other important ideas embedded in the LoU Chart can be seen in the Knowledge Category. As has been strongly emphasized in all publications and descriptions, LoU is a behavioral phenomenon. However, the Knowledge Category also is constructivist in nature. As one reads down the chart from LoU 0 Nonuse, each Knowledge Category description reflects an increasingly complex schema of understanding in relation to using the innovation. In other words, becoming skilled in using an innovation requires a great deal of learning.

Rating Overall Level of Use

The Levels of Use Chart provides a framework for describing individuals in the process of adopting innovations. By nature, a "framework" does not and cannot provide all of the information necessary for making decisions about individuals. This section discusses each LoU and Decision Point and provides insight as to how the Decision Points and Categories help determine LoU. Each Level of Use represents a particular behavioral profile or pattern of use. The sequence of LoU is logical, but there is no guarantee that an individual will move through all Levels in a lock-step developmental fashion. This is one reason that LoU interviewers are trained not to base their rating on the amount of time and experience the interviewee has had with the innovation. Each LoU is viewed as dependent.

This does not mean, however, that there is not a general pattern to movement across the Levels of Use. Our analyses indicate that if a change process unfolds well, most individuals will move in sequence from LoU 0 Nonuse to LoU IVA Routine. After this point, a number of movements are likely, including staying at LoU IVA, moving to LoU IVB Refinement, or moving back to LoU III Mechanical Use, such as when refinement is attempted.

It should be noted that individuals continually make adjustments with respect to their use of innovations, but often these adjustments are not enough to change their overall LoU. The following examples suggest the range that may be seen at each Level of Use by describing individuals at the extremes of each LoU.

LoU 0 Nonuse

LoU 0 Nonuse may include persons who have never heard of the innovation but may also include the person who has acquired knowledge of the innovation but is not otherwise involved with or considering use of the innovation.

It is entirely possible and even likely that there will be people in a particular school or other organization at Level 0 even when there are others at the school or organization who are active users of an innovation or actively implementing a reform. Those at LoU 0 are not using the innovation for whatever reason, have no plans to use it, and are not thinking about

the innovation. Past users who are no longer active with the innovation might also be rated an overall LoU 0.

Typical responses for those at LoU 0 might be similar to the following:

- I don't foresee learning anything about it in the near future. I have too many other things to do.
- I'm really not looking for anything new right now.
- I have no plans to use the innovation.
- I've heard of it, but right now I'm not interested in learning anything more about it.

LoU I Orientation

According to Decision Point A, the person at LoU I must be actively initiating the accumulation of knowledge or must have done so within the last 3 months.

Users who are at LoU I Orientation may range from the person who has recently acquired information and is beginning to explore the implications of use of the innovation to the person who has had much exposure (perhaps through reading, workshops, observation, or coursework), has analyzed potentials, and is deciding whether to use the innovation. It should be noted that having general knowledge about an innovation does not automatically place an individual at LoU I. The LoU I person is seeking information about the innovation (LoU I, Acquiring Information Category) or has acquired information within the last 3 months. The user is also considering the pros and cons of using the innovation (LoU I, Assessing Category). Therefore to be at LoU I Orientation, the user should be at least LoU I in the Knowledge, Assessing, and Acquiring Information Categories.

Typical responses for individuals at LoU I include the following:

- I've set aside time every week for studying materials about the innovation and I am talking to people about the possibility of using it.
- I'm looking at materials pertaining to the innovation and considering using it sometime in the future.
- I've attended the workshop and observed other teachers who are using the innovation.

LoU II Preparation

According to Decision Point B, the individual becomes LoU II when and only when a date or time to begin using the innovation has been established. This includes an intention to begin implementing an innovation at a certain date if contingencies beyond the individual's control do not delay use. Decision Point B holds whether the motivation is intrinsic or extrinsic, as seen in these statements:

- If I teach the course next fall, I'm going to use the innovation. (Intrinsic)
- I don't want to use the innovation, but the powers that be have decreed that I must beginning next semester. (Extrinsic)

Individuals who are LoU II range from the person who intends to begin innovation implementation at a certain time, but knows little about what is required to begin implementation, to the person who is ready to begin use after having actively prepared for use across the Categories. Here are typical responses for individuals at LoU II:

- I'm looking through all of these materials, attending workshops, and getting organized to implement the innovation.
- I'm going to start using the innovation next semester.

- Since I'll be using the innovation in September, right now I'm identifying what I'll need and when I should begin to set things up.

LoU III Mechanical Use

According to Decision Point C, changes (if any) and use of an innovation are dominated by user needs.

Individuals at LoU III include the person who is using survival tactics and is almost overwhelmed by the task of actively implementing the innovation. This person rarely plans for more than a day or week at a time. LoU III also includes the person who is more efficient and less uncertain while using the innovation, but is still making changes to make his or her role easier.

Changes evident at LoU III are most often logistical or managerial and are for the primary purpose of easing the pressures and requirements of use of the innovation on the user. Detailed planning is rarely more than short-term. LoU III users are not always very articulate about their use of the innovation. In fact, raters sometimes wonder whether the LoU III user has told them anything. Although it was mentioned earlier in this manual that users in the first cycle of use are often at LoU III, it cannot be assumed that because a person is in the first cycle of use that he or she will be at LoU III.

Typical responses of an individual at LoU III may be similar to these listed below:

- Most of my time is spent organizing materials and keeping things going as smoothly as possible every day.
- I'm not really sure what I'll be doing later this year or what the effects of the innovation will be. There still seem to be a lot of problems to work out.
- I'm planning every night for what I will do the next day. I know in general what I'll do next month but have not made detailed arrangements.
- I spend most of my time with colleagues trying to get things organized so the innovation can be more effective with the students.

LoU IVA Routine

According to Decision Point D-1, in order to be considered LoU IVA, a routine pattern of use is established.

Individuals at LoU IVA range from the user who is settled into a routine with virtually no change in use to the user who, even though highly concerned about students, varies use only as a part of an established way of doing things.

The lack of change is the key to LoU IVA, but it is important to note that there should be no value judgment applied to this LoU. A user may be at IVA as a result of having recently made a high-quality change and waiting for a year to see what the effects are. On the other hand, the IVA user may not have changed or thought of changing use of the innovation for many years. These users have different qualities of use, but they are both at LoU IVA.

One class of changes can be made by LoU IVA users without affecting their LoU: these are routine changes that are made on a regular basis, that the user has made before and will make again. These changes may be for the benefit of the user or the students, but as long as they are a part of the regular pattern of use, the user is at LoU IVA.

Typical responses from an individual at LoU IVA include these:

- This year has worked out beautifully. I'm sure there will be a few changes next year, but basically I will use it the same as this year.
- The students adjusted so nicely to the innovation, I haven't felt like I've needed to make many changes.
- We've done evaluation, but all the feedback has been good, so we really have not made any changes.
- This is the second year I've used the science modules. I use them as they are written, and they work fine in my classes.

LoU IVB Refinement

Decision Point D-2 indicates that changing use of the innovation is based on formal or informal evaluation in order to increase student outcomes. According to this Decision Point, the individual must be involved with student-oriented change to be at LoU IVB. The individual must have made a change recently (within 3 months), be actively planning for a change, be in the process of changing, or be in the process of evaluating a change with respect to use of the innovation.

Persons at LoU IVB may range from the user who is assessing use and actively collecting detailed information for the purpose of making changes to benefit students to the user who is continuously in the process of evaluating and changing the use of the innovation to benefit students.

At LoU IVB the motivation for a change is important in that the changes are made primarily to increase benefit to students. A person can be at LoU IVB when some changes have been made to benefit himself or herself if and only if changes have also been made to increase impact on students. The user at this level is aware of the effects of the innovation on students and may be collecting this information through observation, interaction with students, or formal evaluation of innovation use. Whatever the source, this information is used to change innovation use to improve student outcomes.

An individual at LoU IVB may have responses similar to these:

- I'm trying to find out from books and workshop sessions how I can combat this effect *(describes particular effect)* that the innovation seems to be having on students.
- I discuss some of the things that seem to be working best with my students and also the things I'm changing that aren't as effective as I would like.
- I recently developed a more detailed assessment instrument to gain more specific information from students to see where I need to change my use of the innovation.

LoU V Integration

Decision Point E indicates that the individual initiates changes in use of the innovation based on input from and in coordination with what colleagues are doing. In order to arrive at LoU V, the individual must reach beyond his or her own use of the innovation to work with others for the purpose of increasing student outcomes. If the individual has always worked with other users, i.e., if the original innovation adoption "unit" involves a team or group, the individual must reach beyond this original group for LoU V to be achieved.

Those at LoU V range from the user who is exploring with others how to increase the impact of the innovation on students within their common sphere of influence to the user who systematically

initiates and executes plans to integrate his or her use of the innovation with others' use to increase impact of this innovation on their mutual students. LoU V requires that collaboration be for the purpose of increasing client impact through the use of the innovation; it cannot be just sharing for the convenience or benefit of the users. Collaborators must be concerned about students within a common sphere of influence. This means that the changes that are made collectively with respect to the innovation and the activities that are pursued must benefit the students of all collaborators. A user who is simply disseminating information about an innovation is not collaborating to benefit his or her students and cannot be considered an LoU V.

Typical responses of individuals at LoU V may be as follows:

- We have increased our original group from two to three because we discovered our students can profit from more coordination of use.
- Not everyone has all the skills needed to make the best use of this innovation when it comes to relevance for students. For that reason, I've been working with another teacher for two years, and recently a third teacher began working with us.

LoU VI Renewal

According to Decision Point F, an individual progresses to LoU VI when he or she begins exploring alternatives or major modifications to the innovation presently in use. The user must be considering major changes in the innovation or replacing the innovation for the purpose of increasing student outcomes. There must be informed and realistic consideration of alternatives rather than unrealistic dreams or hopes.

Persons at LoU VI range from the person who expresses interest in learning of other resources and innovations that could be used as a basis for making major changes to or replacing use of the innovation to the person who searches for and appraises other resources and innovations that might be added to or used to replace the present innovation or to significantly broaden its impact.

The person at LoU VI is searching, exploring, evaluating, and making concrete plans for change. Once a major change is operationalized, the individual is probably at a different LoU with respect to the innovation; if the innovation is replaced, the individual is a past user. If a major change in innovation use is initiated, the user will likely shift back to a lower LoU such as III or IVB. The size of the change differentiates a person at LoU VI from a person at LoU IVB. An LoU VI change involves major restructuring or replacement of the innovation; an LoU IVB change is made within the structure of current use of the innovation. Expanding current use does not signify an LoU VI change.

Typical responses from an individual at LoU VI include the following:

- I am still interested in the innovation and using it with modifications. Frankly, I'm reading, talking, and even doing a little research to see whether some other innovation might be better for the students.
- Innovations come and go, as may the one I am currently using. I am beginning to see evidence here and other places within the state that several other innovations may be more effective with special needs students.

Chapter Three
Measuring Levels of Use

Figuring out how to measure LoU in a way that would be reliable and valid, as well as affordable, was a major challenge. *Paper-and-pencil measures would not, and cannot, work.* LoU is a behavioral phenomenon. Paper-and-pencil surveys work well for affective variables, but not for variables that must be observed. To measure an operationally defined phenomenon, it is necessary to document behaviors.

The research team decided the best way to assess LoU would be to use some sort of qualitative methodology. However, it would be too expensive to employ full-time ethnographers to follow the users or nonusers around all day and document all of their behaviors that would be reflective of LoU. A more economical method was needed.

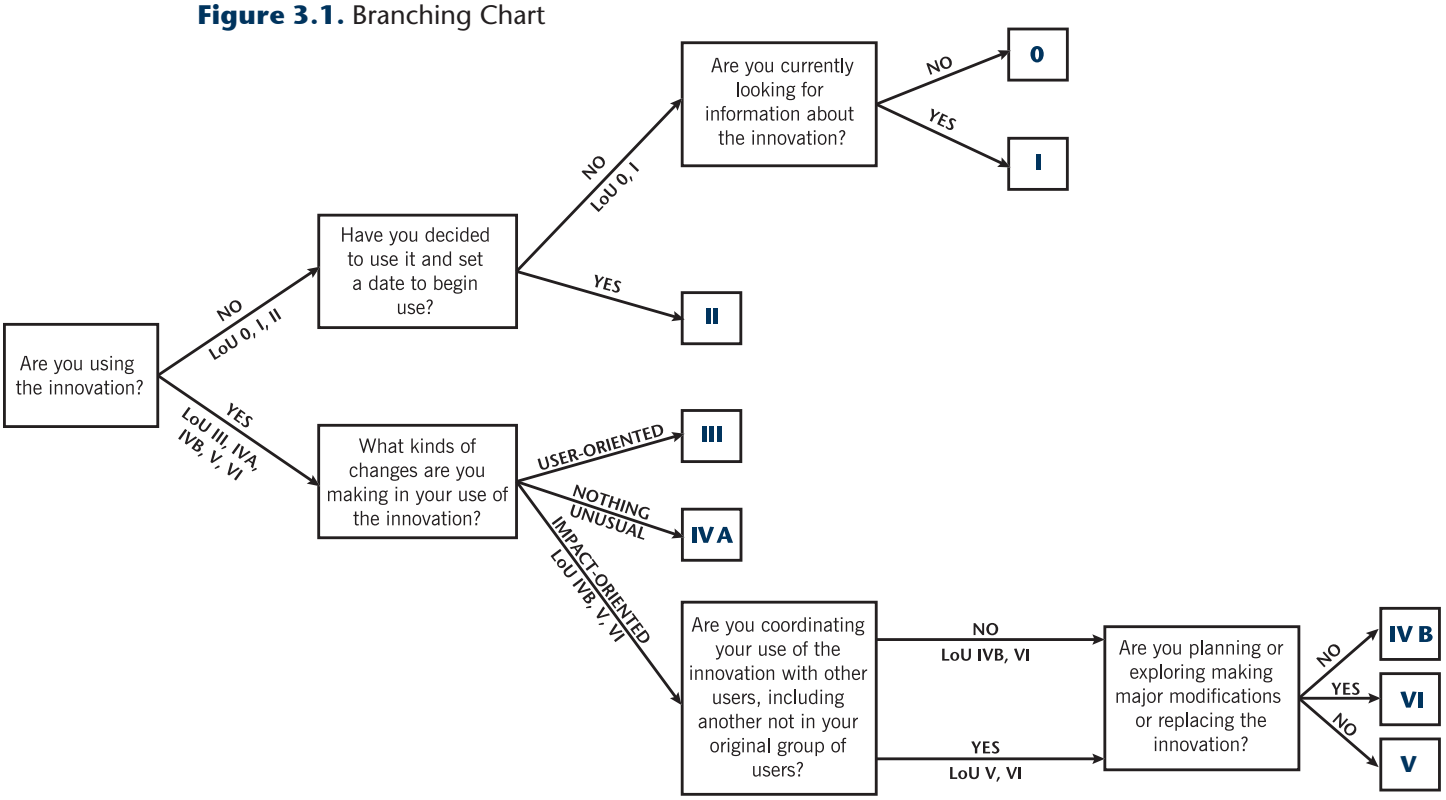
We turned to work by Foster and Nixon (1975), who identified a number of different interview methods, such as "structured interviews." One strategy that they described was the "focused interview." Paper-and-pencil questionnaires typically ask respondents to self-rate in relation to whatever the construct may be. In the case of LoU, this would mean that they would have to first understand the Levels and then be able to distinguish between them. Even when the questionnaire items draw these types of distinctions, they are too nuanced for typical respondents to reliably and validly rate themselves. The strength of the focused-interview procedure is that the interviewer seeks specific examples of the interviewee's current behaviors. The trained LoU interviewer knows how to follow up and probe further to make sure that the reported behaviors are explained sufficiently for rating purposes. The paper-and-pencil approach does not allow for probing, clarifications, and seeking additional examples of behaviors. The focused interview was the solution to our LoU measurement dilemma.

The LoU focused interview uses a branching technique, and depending on what the interviewee says, the interviewer asks questions from a particular branch of the protocol. Because LoU is an operationally defined phenomenon, in terms of Levels, Decision Points, and the Categories, the perfect conceptual pieces were there to design a focused interview. The Decision Points provided the basic branches for the LoU interview (see Figure 3.1).

The LoU Interview Protocol

The LoU interview is organized around the Decision Points and the branching format. The basic interview protocol is presented in appendix A. *These questions must be asked for each branch taken during the interview.* The interview begins by asking in an open-ended way whether the interviewee sees him- or herself as a user or nonuser. The interviewer does a "configuration hunt" at the beginning. Prior to interviewing, three to five basic requirements or components needed for classification as a "user" must have been determined. The LoU interviewer then begins the interview with questions regarding the extent to which each of these components is

Figure 3.1. Branching Chart



being implemented by the interviewee. It helps to have developed at least a rudimentary Innovation Configuration (IC) Map for this part of the LoU interview (Hord, Stiegelbauer, Hall, & George, 2005). The first decision branch in the LoU interview is to decide whether the interviewee meets the basic criteria to be a user, regardless of the Level.

Once it is established that the person is or is not a user of the innovation, the appropriate branches are followed and the appropriate LoU interview questions *must be asked. All of these questions need to be asked as stated in the LoU interview.* No creative paraphrasing is permitted. *Ask these questions as stated.*

The creative challenge for the LoU interviewer is in developing appropriate questions to obtain behavioral information related to each Category. This is the part of the interview that we call *probing*. In LoU interviewer training, heavy emphasis is placed on learning how to probe to obtain examples of behaviors related to each Category and the appropriate Decision Point.

Reliability and Validity of LoU Interviews

Once the CBAM team developed the LoU interview, another problem had to be addressed. Using an interview to measure a phenomenon is suspect in the research community. This was particularly true back in the 1970s, when the positivist paradigm for research was dominant. There was a tendency to see interviews as self reporting, rather than the information being "objective." Information obtained from an independent source can be assumed to be more accurate, whereas there is a concern that interviewees can be biased in their reporting. This problem necessitated a targeted study to

test and verify the LoU interview as a reliable and valid way to measure LoU. The results of this study are included in an article, published in the *American Educational Research Journal*, titled "A Developmental Model for Determining Whether the Treatment Is Actually Implemented" (Hall & Loucks, 1977, pp. 267–268):

> A validity study of the LoU Interview procedure was conducted using an ethnographic methodology. This approach was selected since it would provide a broad base of qualitative data collection during both in-class and out-of-class time. Forty-five junior high school teachers in two school systems were interviewed in relation to their use/nonuse of the Intermediate Science Curriculum Improvement Study (ISCS). Based on the LoU Interview ratings, seventeen teachers representing a stratified sample including all LoU Levels were selected for ethnographic observation. Ethnographers spent one full day with each teacher, from the time the teacher arrived at school to the time s/he departed. Using the operational definitions of the LoU as guidelines, the ethnographers took extensive notes on the in-class and out-of-class behaviors and interactions of the teachers in relation to their science teaching. At the end of the day, the ethnographers assigned an LoU rating to the teachers and developed a set of written protocols.
>
> Two major comparisons of the data were made as estimates of the validity of the LoU Interview: 1) the ethnographer's LoU rating of the teacher was compared with the consensus LoU Interview rating, and 2) the consensus ratings of the independent readers of the protocols were compared with the consensus LoU Interview rating.
> The correlation coefficient determined for the first comparison was .98, clearly indicating that, for this sample, the focused interview ratings were consistent with a full day's direct observation of the teacher's use/nonuse of the innovation of ISCS. The coefficient for the second comparison was .65.

LoU interviewer reliability in this study, as well as in all others, is checked by having a sample of interviews rated by a second qualified rater. Various types of agreement coefficients can be calculated, but percent agreement is the strongest indicator of reliability. Because LoU is a categorical rather than a continuous variable, ratings are either right or wrong. The rater either identifies the correct Level, or the rating is incorrect. In studies, if there is not agreement between the interviewer and a rater, then a third rating is done.

Establishing LoU Interviewer Reliability

Two standard procedures have been used to measure the reliability of LoU ratings. The first provides a "percent agreement" for each rater and an overall group of raters; the second provides the traditional Cronbach's alpha coefficient. Because the Cronbach alpha is familiar to researchers, this measure is preferred when publishing the results of studies. These procedures are useful for training purposes as well as for providing an index of reliability during conduct of a study. In addition to providing numerical indications of reliability, these procedures invariably lead to valuable discussions among the raters after they see how others rated interviews with which they are familiar.

To illustrate these techniques, imagine a group of nine individuals has been trained to conduct LoU interviews and to rate each interviewed teacher. Near the end of training, each of these potential researchers has conducted several LoU interviews with actual teachers who have been selected to represent a range of experience with the innovation under consideration. One taped interview from each of the nine trainees has been selected at random for the reliability test, plus one additional interview to bring the total to ten. We recommend ten ratings to be the minimum in order to get an accurate estimate of reliability. All nine interviewers then rated each tape and assigned an overall Level of Use to each teacher. The resulting data are shown in Table 3.1 below.

The first recommended analysis consists of computing the pair-wise agreements of ratings between each of the raters. For example, Joe, Kay, and Phil each rated teacher 1814 as LoU I. Thus, Joe, Kay, and Phil had two agreements each out of a possible eight, resulting in a 25% agreement score. The other six raters all agreed with each other, so each has five agreements of the possible eight, resulting in a 63% agreement score. These are calculated for each LoU interview, resulting in the scores seen in Table 3.2.

Note that in Table 3.2 an overall percent agreement has been calculated for each LoU interview and rater. Thus, this procedure provides an estimate of the skill of each person according to both interview skills and rating skills, as well

Table 3.1. Levels of Use Ratings for Reliability Estimates

		Raters of the Level of Use Interviews								
Teacher ID	**Interviewer**	**Joe**	**Ron**	**Mike**	**Sue**	**Mary**	**Bill**	**Kay**	**Ginger**	**Phil**
1814	Joe	I	II	II	II	II	II	I	II	I
3242	Joe	IVB	IVA	IVB	IVA	IVA	IVB	IVA	IVA	IVA
1954	Ron	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA
4118	Mike	IVB	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA
9842	Sue	III	III	III	III	III	III	III	III	III
2657	Mary	V	V	V	V	V	IVB	V	V	V
4611	Bill	IVA	III	III	III	III	III	III	III	IVA
5629	Kay	III	IVA	III	IVA	IVA	IVA	IVA	IVA	IVA
9878	Ginger	V	IVB	IVB	IVB	IVB	IVB	IVB	IVB	V
0671	Phil	III	III	IVA	III	III	III	III	III	III

*Note: Ratings in bold indicate the rating of an individual's own interview.

Table 3.2. Percent Agreement Between Raters Based on All Possible Pair-Wise Comparisons

		Raters of the Level of Use Interviews									
Teacher ID	Interviewer	Joe	Ron	Mike	Sue	Mary	Bill	Kay	Ginger	Phil	Overall*
1814	Joe	I	II	II	II	II	II	I	II	I	50
3242	Joe	IVB	IVA	IVB	IVA	IVA	IVB	IVA	IVA	IVA	50
1954	Ron	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA	100
4118	Mike	IVB	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA	78
9842	Sue	III	III	III	III	III	III	III	III	III	100
2657	Mary	V	V	V	V	V	IVB	V	V	V	78
4611	Bill	IVA	III	III	III	III	III	III	III	IVA	61
5629	Kay	III	IVA	III	IVA	IVA	IVA	IVA	IVA	IVA	61
9878	Ginger	V	IVB	IVB	IVB	IVB	IVB	IVB	IVB	V	61
0671	Phil	III	III	IVA	III	III	III	III	III	III	78
	Overall**	46	81	63	81	81	69	78	81	65	72

*Percent Agreement for LoU Interview
**Percent Agreement With LoU Raters

as a summary estimate of the group agreement. In this hypothetical example, the overall rating agreement estimate was 72%, which is representative of teams trained over the years. Notice that Joe has the lowest scores on both his interview and ratings of others' interviews. Ron and Sue seem to have conducted excellent interviews, eliciting information allowing the other raters to all agree on their teachers' Level of Use. Ron, Sue, Mary, and Ginger had the highest average agreements on their ratings, at 81%, and Kay was close with 78%. On the other hand, Joe had only 46% agreement with others on his ratings. Both his tapes appear to be difficult to rate reliably, with an average 50% agreement across the nine raters. Thus, Joe appears to need more training regarding both interview and ratings skills. Mike, Bill, and Phil have better scores, between 60% and 70%, but each has room for improvement. A single analysis is not definitive, of course. One also needs to keep in mind that some teachers are difficult to rate because their answers are not consistent from one question to another even when they are questioned by highly skilled interviewers.

The second procedure that has been applied to LoU ratings to estimate reliability involves converting each LoU rating to a numeric value and then applying a traditional analysis for estimating Cronbach's alpha. The authors recognize that LoU is far from an the interval scale; these numerical conversions were chosen to capture primarily the order of the

Table 3.3. Cronbach's Alpha Coefficients Based on Reliability Rating Procedure

Rater	Correlation With Total	Alpha if Deleted
Joe	.911	.989
Ron	.980	.985
Mike	.868	.989
Sue	.980	.985
Mary	.980	.985
Bill	.960	.986
Kay	.985	.985
Ginger	.980	.985
Phil	.942	.987

ratings according to the underlying theory of developmental sequence. The conversion is straightforward: LoU 0, I, II, and III are 0, 1, 2, and 3. LoU IVA becomes 4, while IVB is converted to 4.5. LoU V and VI are converted to 5 and 6.

After this conversion, the data set can be analyzed as though each rater were a different "variable." The results of application of this procedure to the LoU data in Table 3.2 are seen in Table 3.3. For this data set, the overall alpha would be .988. While this is an unusually high alpha coefficient, due to the wide range of Levels of Use in the sample as well as the accuracy of the raters, high alpha coefficients using this procedure are not unusual. The Level of Use rating system tends to produce highly reliable ratings when the interviews are properly conducted and the raters well trained. Notice in Table 3.3 that Mike is identified as the least accurate rater, with Joe and Phil progressively higher. These are not in the same order as with the previous procedure, because percent agreement is not sensitive to "how far off" the ratings are from the others, while this procedure does take that into consideration.

LoU Interviewer Training and Certification

Becoming a qualified and skilled LoU interviewer requires study, training, and practice. The various documents and descriptions in this manual provide only a rudimentary introduction. The book *Measuring Levels of Use of the Innovation: A Manual for Trainers, Interviewers, and Raters* (Loucks, Newlove, & Hall, 1975) is a useful study guide. However, even in combination, these print resources do not replace formal training. The basic steps for becoming certified are outlined in Table 3.4. Certified LoU interviewers' expertise includes the following:

1. They understand and have internalized the construct of Levels of Use as defined in the LoU Chart.
2. They can conduct LoU interviews using the branching format, the required basic questions, and appropriate probes.
3. They are able to rate LoU interviews reliably.

LoU Interviewing Mechanics

Over the years, we have learned a lot about conducting LoU interviews. The following are some of the more salient points:

1. LoU interviews should be audio recorded. This provides a record of the interview and permits a second rating for reliability checks. We have not found that audio recording is a threat to most interviewees, assuming that the LoU interviewer does an effective job of introducing the need and requesting interviewee permission.
2. The LoU interviewer must rate all Categories and give the overall rating on the LoU Rating Sheet (appendix B) for each interview. The interviewer has the first-hand information and therefore should be the best rater, especially compared to the second rater, who has only the audio recording. Typically, LoU interviews take less than 30 minutes.
3. It is imperative to have determined in advance a set of criteria (three to five components) for making the use/nonuse decision.
4. The Decision Points are key to determining overall LoU.

In summary, to maintain the validity of the LoU instrument, it is essential that the researcher maintain the strict standards identified in this manual. Interviews should be conducted by a trained LoU interviewer and recorded either

Table 3.4. Steps in Certification for Levels of Use Interviewing

Certification for Levels of Use interviewing requires meeting criteria for both carrying out and rating interviews. Steps for certification include the following:	
1	Training in Levels of Use interviewing by attending a scheduled 3-day training workshop conducted by a CBAM-certified trainer.
2	During the training workshop, rating of three of seven tapes selected by the trainer as part of a seven-tape set of "reliability" tapes (the remaining four will be rated after interviewing skills have been established).
3	Following the workshop, conducting a number of interviews to gain skill, and selecting two (one for a user and one for a nonuser) to submit to the trainer for critiquing and feedback. Minimum criteria for "use" are included and the LoU rating sheets are attached. The purpose of these two interview tapes is to demonstrate interviewing capability: establishing rapport (comfort) with the interviewee, and using the LoU interview questions and probes to gain sufficient information for rating the tapes.
4	Submitting additional tapes if required by the trainer to improve either interviewing or rating skills.
5	Rating the last four "reliability" tapes, which together with the rating of the first three tapes are used to establish a reliability score. To establish adequate interrater reliability, the rater must agree with the trainer ratings of the same tapes 57% of the time.

on tape or digitally, so that evaluation of the interview can be completed after the interview and not during the interview, and will be available for a second rating and review at a later date. The interview protocol should provide the basis for the interview and should be supported with appropriate, open-ended, probing questions. Keep in mind the following questions when gathering information about changes made in implementation: (a) Why? (b) What? (c) When? and (d) What plans? Every effort should be made not to lead the interviewee; *the interviewer must keep questions focused on what the subject is doing with the innovation at the present time.*

There are many more practicalities and rating rules that are acquired only through participating in LoU interviewer training and becoming fully certified. All of these resources—the LoU Chart, training, and rating rules—are what result in reliability and validity in using a focused-interview procedure to measure an operationally defined construct. There can be no guarantee that data collected without these steps are indeed reliable and valid information about Levels of Use.

Chapter Four
LoU Applications

Levels of Use can be applied to a number of different purposes, which are discussed below.

LoU is a generic construct, so the procedures and the findings can be applied across innovations.

The construct can be applied to any innovation or initiative without changing definitions or the interview protocol. The only requirement is that the use/nonuse criteria be established and that the interviewers understand the innovation or program. An additional advantage is that, if useful, LoU information can be aggregated across innovations.

LoU can be used to assess use/nonuse in experimental, treatment/control, and control-group studies.

In the field of education, one way of evaluating implementation of a new program or innovation is to identify treatment and control groups. The treatment group receives the new program, process, procedure, or equipment. Often there is training in use of the innovation for members of the treatment group. The control group receives neither the materials nor the training. Following installation of the materials, program, procedure, or system, typically there is an effort to measure outcomes. The general expectation is that there will be higher outcomes in the treatment group. However, this finding is rare. Most often the evaluation study reports "no significant differences in outcomes."

There are a number of potentially precarious assumptions with this classic treatment/control-group approach. For example, all too often there is an unfortunate assumption that everyone in the treatment group uses the innovation. In the first such application of LoU, Loucks (1975) found in one major school district evaluation study that only 80% of the teachers in the treatment schools were using the innovation. In addition, she found that nearly 40% of the teachers in the control-group schools were also using the innovation. The two sets of schools had been matched in terms of demographic variables, and the treatment schools had had three years of implementation support. The school district evaluators had assumed two sets of subjects without checking at the individual level. Random assignment of subjects does not make these assumptions any less risky. The only way to know for sure that the treatment group is composed of users and that the control group has no users is to assess the LoU of each individual in *both* groups.

The LoU construct introduces another risk: Use is not dichotomous. The treatment or control-group design assumes that there are only two categories of subjects: those who use the innovation and those who do not. Instead, the LoU construct shifts the perspective from one of either use or nonuse to one that encompasses multiple approaches to using the innovation. LoU identifies three behavioral profiles of nonusers and five profiles of users.

LoU represents one way to document the progress each individual has made in implementing change.

In the CBAM perspective, change is assumed to be a process, not an event. When there are study questions related to the influence and effectiveness of innovations, the established research design is to identify two groups—treatment and control (if randomly assigned), or treatment and comparison (when assignments are based on controllable variables). The problems with this approach have been addressed above.

Rather than selecting two groups that are artificially assigned, in the CBAM approach individuals are assigned based on where they are naturally. The Implementation Bridge metaphor addresses this approach. Rather than each individual being assigned to one of two groups, a priori, in the CBAM method each individual is assigned in terms of how far he or she has moved across the Implementation Bridge (Hall et al., 1999). Levels of Use provides a useful way to determine this placement. Once individuals are assigned an LoU, the relative effects of their efforts on outcomes can be correlated.

Levels of Use can be applied to innovation bundles.

Many of the early LoU studies were done with single innovations. This was done in order to reduce the variance that large innovations and innovation bundles might introduce. An unfortunate inference from those early studies has been that LoU does not apply to large innovations and innovation bundles. In fact LoU can be applied in large-scale change efforts, such as Comprehensive School Reform. The same definitions, Categories, and Decision Points apply. Rather than interviewing for a single innovation, the protocol addresses use of the bundle. In these studies it will be more important to incorporate Innovation Configuration data, since our experience has been that individuals tend to view selected innovations within the bundle as their frame of reference for viewing the whole effort. The researchers/evaluators can interview for and determine an overall LoU rating for the bundle and there will also be clues about which innovations within the bundle are of primary attention for each individual.

LoU can be applied to groups, teams, and whole organizations.

The same descriptions of LoU can be applied to the functioning of groups, teams, and whole organizations. Visualizing a team that is functioning at LoU III Mechanical Use is easy. There is a short-term focus to planning; the team discussions center around how to make the team more efficient and organized (Decision Point C, Assessing, and Sharing). The team decides to post the agenda for meetings three days ahead of time so that members can prepare in advance (Performing). There is little or no action related to how teamwork affects clients (i.e., student learning).

LoU can be used to examine the relationship between extent of implementation and student outcomes.

Levels of Use provides the opportunity to do a more fine-grained analysis of the relationship between using and not using an innovation and outcomes. For example, in the Loucks (1975) study, the school district evaluators did the traditional analysis and found "no significant difference" between the treatment and comparison schools in terms of student achievement. Given Loucks's finding that both groups contained a mix of users and nonusers,

this statistical finding makes sense. Based on this finding, the school board voted to cut support for the innovation. Loucks did a different analysis. She ran the comparison between "users" and "nonusers" of the innovation, regardless of their school's assignment. The results were statistically significant at the .01 level for both reading and mathematics. The individual users of the innovation had higher student achievement than did the nonusers.

We have found this in a number of studies, including a major study in the Hessen (Germany) School District of the Department of Defense Dependents Schools (DoDDS). Levels of Use data were collected at the end of the first and second years of implementation of a standards-based mathematics program (Thornton & West, 1999). This study had more than 100 teachers participating each year. When Levels of Use of teachers were associated with student learning, we found that the higher the LoU, the higher the student learning. Although there were only two LoU V Integration teachers, their students had the highest achievement of all. We also found that with this innovation there was a reduction in the achievement gap (George, Hall, & Uchiyama, 2000). One of this study's unique aspects was that it took on the form of action research. School district personnel, including the superintendent, became certified LoU interviewers and conducted LoU interviews.

LoU assessments provide valuable information for those who are responsible for facilitating implementation.
Change facilitators understand the descriptions and logic of LoU. They are grounded in the day-to-day realities of implementation. LoU assessments can provide them with diagnostic information about the types of facilitating interventions that should be done to further advance the change process. Regular LoU assessments (typically once or twice a year) provide systematic measurement of how well, fast, and far the implementation effort has gone. This type of evidence can also be useful in explaining and documenting progress to policymakers—for example, school boards—while conveying that there is more to do to fully implement the innovation or program.

LoU interviewing can be considered a clinical skill.
Change facilitators who have taken the full LoU interviewer training for researchers have found that it was helpful in their listening and probing. Although not a primary topic in this document, LoU can be incorporated into less formal interviews. Administrators, staff developers, and other change facilitators can use a shortened version of the research LoU interview in their regular conversations with users, nonusers, and others.

Levels of Use as a construct and its related interview have been applied in a wide range of settings and with a great variety of innovations. The following chapter introduces a number of these studies and findings. There are many other studies that could have been included. Each of the selected studies represents an example of how LoU can be used or should be used.

Chapter Five
Review of the Research Related to the Levels of Use

Over the past 30 years, a variety of studies have been conducted using the Concerns-Based Adoption Model and, in particular, the LoU interview protocol. Current uses of the CBAM are diverse, as are the innovations to which the CBAM diagnostic dimensions might be applied.

The quality of the studies conducted since the 1970s varies greatly. The studies included in this review were specifically selected because of their rigor and adherence to the LoU interview protocol. Where possible, training of the researcher in the application and implementation of the LoU interview protocol was verified. Studies that administered the interview using a method other than face-to-face, such as over the telephone or as a questionnaire, were not included, as these alternate methods have not been validated with the rigor used to validate face-to-face interviews. A number of dissertations, journal articles, and evaluation reports were reviewed for inclusion in this literature review.

The studies reviewed can be divided easily into five main categories: (a) informing the LoU process and CBAM in general, (b) informing the change process in general, (c) assessing interventions, (d) examining how the implementation of an innovation affects learning and other outcomes, and (e) assessing implementation. A sixth category—attempts to adapt the LoU interview—could easily be identified, but it is beyond the scope of this literature review to examine the quality of these attempts. A number of efforts have been made to revise, improvise, and modify the LoU interview protocol. Suffice it to say, despite the amount of effort to validate the changes made in these studies, none of the studies reviewed for this manual went to the extent and provided the rigor of the original studies done to validate LoU and the interview protocol.

In the following sections, we provide a brief summary of the studies reviewed in each category and then highlight a few studies in greater detail. Tables are provided for select studies, indicating the year the study was published, author, sample, and findings. As expected, early studies focused more on validating the LoU in different circumstances and the change process in general, and later studies focused more on implementation, effect on student leaning or other variables, and the effect of different interventions on LoU.

Informing the LoU Instrument and Process

As the LoU instrument was developed and implemented, it was important not only to validate the efficacy of using the interview protocol to assess implementation, but also to assess its validity in a variety of settings. These studies form a backbone of research that has been used to refine, define, and provide insight into the viability of the LoU instrument. As indicated previously, many of the earliest studies focused on validating the LoU instrument. Aside from the validation studies (Hall & Loucks, 1977; Hall, Loucks, Rutherford, & Newlove, 1975), a number of studies were performed in the late 1970s and early 1980s to validate the

Table 5.1. Studies That Examine the LoU Instrument and Process

Year	Author(s)	Sample	Design	Innovation	Findings
1978	George & Rutherford	$n = 146$	Correlational	Team Teaching	There is a significant relationship between change in overall LoU and time, $p < .05$.
1978	George & Rutherford	$n = 117$	Correlational	Modules	There is a significant relationship between change in overall LoU and time, $p < .05$.
1979	Rutherford & Loucks	$n = 42$	Correlational	Glasser's Reality Therapy	Those who became nonusers or who remained nonusers had high awareness concerns.
1980	Dominguez, Tunmer, & Jackson	$n = 34$	Ethnographic	ESL/Spanish Reading/Spanish Math/Culture	CBAM provides a useful system of instruments (SoC, LoU, and Innovation Configurations Maps) and procedures for building a prescriptive program to facilitate the adoption of bilingual programs.
1981	Rutherford	$n = 411$	Descriptive	Team Teaching	Levels of Use do exist.
1982	Cantor	$n = 17$	Descriptive	Auto Mechanics Curriculum Project	LoU is viable in vocational education.
1984	Marsh	$n = 59$	Descriptive	Geography Curriculum	LoU provides meaningful data for people involved in curriculum development and implementation activities.
1984	Stedman	$n = 25$	Causal Comparative	Competency-Based High School Diploma Program	A multiple regression analysis indicated that Stages of Concern are significantly associated with LoU. All subscales of the Stages of Concern, except for consequence, had a significant effect on LoU, $p < .05$.
1988a	Mitchell	$n = 7$	Descriptive	Timeliner	Those with intense individual concerns had low Levels of Use of the software.
1988b	Mitchell	$n = 118$	Correlational	Evaluation Data	Although high-achieving schools used evaluation data at a higher LoU, no significant difference was found between LoU and achievement scores
1992	Savage	$n = 30$	Causal Comparative	Third-Grade District Curriculum Guides	No significant relationships were found ($p > .05$) between the use of the innovation and other factors.
1995	Marcais	$n = 25$	Causal Comparative	Innovation and Teaching and Learning Fellowship	Teaching style and personality had no effect on LoU.
1995	Steele	$n = 13$	Correlational	Functional Skills Curriculum	All subjects were users of the innovation.

Year	Author(s)	Sample	Design	Innovation	Findings
2002	Falkenberg	*n* = 23	Correlational	A Science Innovation	LoU and creativity served to better differentiate the teachers' skills.
2005	Wisniewski et al.	*n* = 145	Descriptive	Universal Design	Implementation of Universal Design is a good indicator of teacher quality.

use of the LoU instrument in different contexts and to analyze its relationship with the Stages of Concern (SoC). The studies presented here, as outlined in Table 5.1, incorporate many of the earliest studies used to validate LoU, as well as later studies that examine the relationship of LoU to SoC and Innovation Configurations, bringing added insight to the validity and reliability of the LoU instrument.

The earliest research verified that Levels of Use do exist; they can be identified and are consistent with the LoU model. A number of studies reviewed here verified the application of LoU to a variety of settings (Cantor, 1982; Dominguez, Tunmer, & Jackson, 1980; Marsh, 1984; McKinnon & Nolan, 1989; Mitchell, 1988a; Stedman, 1984; van den Berg & Vandenberghe, 1981). The settings studied include bilingual education, vocational education, adult basic education, curriculum development and implementation activities, program evaluation, and staff development. Van den Berg and Vandenberghe were the first to do a cross-culture check using the LoU instrument and the other CBAM instruments to assess change in schools in Belgium and the Netherlands.

Throughout this foundational research it is clear that in order to determine how an innovation is being used, one must go to the individual teacher (Rutherford, 1981; Rutherford & Loucks, 1979), no matter the arena in which the innovation is being implemented. Individual concerns and use cannot, at any one time, be predicted by group concerns and use (Rutherford & Loucks, 1979), and the LoU instrument is a tool that can be used to identify individual implementation and use of an innovation. One researcher (Falkenberg, 2002) extended this perspective, suggesting combining classroom observation with the LoU interview to better categorize teacher implementation of an innovation.

Researchers found that LoU is closely intertwined with SoC (Stedman, 1984). Change in LoU is anticipated by changes in SoC, having almost a predictive relationship (George & Rutherford, 1978). Individuals with intense Personal concerns tended to demonstrate a lower LoU of the innovation (Mitchell, 1988a; Savage, 1992). On the whole, users of an innovation were found to have lower Personal concerns and higher Impact concerns than nonusers. Those operating at a higher LoU and with high Impact concerns were more frequently found to be using an innovation with a high degree of fidelity and more closely aligned with an ideal configuration for implementing the innovation (Steele, 1995).

Additionally, evaluators have found CBAM—in particular the LoU dimension—to be an excellent tool to support formative program evaluation (McKinnon & Nolan, 1989; Mitchell, 1988a, Mitchell, 1988b), as it assists the evaluator in defining program elements and interpreting related teacher concerns and use. The LoU instrument and the other dimensions of CBAM allow the evaluator to monitor use, design practical intervention strategies, and attribute outcomes to the program.

Most recently, Wizniewski, Glass, Alper, and Dirksen (2005) explored the possibility of evaluating teacher quality by using special education teachers' implementation of Universal Design principles and critical attributes to provide special education students with access to the general education curricula. In collaboration with special education teachers, the researchers identified critical attributes related to the use of Universal Design to guide instructional decisions. Review of the data found that a teacher's LoU of Universal Design was a good indicator of teacher quality and that LoU could be used as a viable tool to report teacher quality of special education teachers on a state level.

Informing the Change Process

Over the years, a number of studies have been performed for the sole purpose of better understanding the change process itself. As the Concerns-Based Adoption Model is used to evaluate and facilitate the change process, it is important that we examine how the LoU instrument has been used to inform the change process. The studies discussed in this section (see Table 5.2) were selected because they provide insight into the change process itself, factors that influence the change process, or facilitation of the change process. The earliest studies presented here were actually studies designed to examine the implementation of various innovations and in the process provided some valuable information regarding the change process as a whole.

Change is cyclical; once users move to LoU IVA Routine, they move in and out of Routine use as they work to refine their use. Levels can be skipped, although movement tends to be in a linear fashion as the teacher moves from nonuse to Routine use (Hall, 1977). Additionally, it takes time to resolve Personal and Management concerns as individuals move toward LoU IVA Routine use (Loucks & Hall, 1979). Institutional variables, interventions, conditions, and leadership all influence this change process.

In a series of LoU studies conducted in the Netherlands (Geijsel, van den Berg, & Sleegers, 1999), researchers found the following to be true in schools that more readily adopted innovations when compared with schools that do not readily adopt innovations:

- Teachers know and share the leader's vision.
- A leader has taken responsibility for facilitating joint goals and stimulating a culture of collaboration.
- The leader radiates dedication.
- Understanding of and respect for personal feelings is communicated.
- Greater collaboration is fostered.
- Teacher participation in decision making through team meetings is facilitated.
- There is a common need and desire for personal growth as well as continued schooling and training.

As evidenced by these findings and others, the change process is directly impacted by at least four variables: the institution, leadership within that institution, the individual teacher, and how evaluation data are used to support the change process.

The prevailing school climate and other factors were found to have a strong influence on the change process. A more democratic, open school climate and a teacher operating at a higher psychological level promoted the greatest use of the educational ideas (Evans & Hopkins, 1988; Hopkins, 1990). The cultural factors

Table 5.2. Studies Related to the Change Process

Year	Author(s)	Sample	Design	Innovation	Findings
1977	Hall	*n* = 190	Longitudinal	Team Teaching	LoU of teaming is associated with years of teaching experience.
1977	Hall	*n* = 160	Longitudinal	Modules	LoU of modules is associated with years of teaching experience.
1977	Hall	*n* = 45	Longitudinal	Science Curriculum Improvement Study (SCIS)	LoU of SCIS is associated with years of teaching experience.
1979	Loucks & Hall	Varied, *n* = 52–75	Longitudinal	Districtwide Science Curriculum	Providing three levels of in-service facilitated the adoption process; however, it may take more than one full cycle of teaching the complete unit to resolve Personal and Management concerns and move to LoU IVA Routine use.
1980	Hall, Hord, & Griffin	Varied, *n* = 52–75	Longitudinal	Districtwide Science Curriculum	Implementation varied, primarily because of the actions and concerns of the principal.
1980	Loucks & Melle	Varied, *n* = 52–75	Longitudinal	Districtwide Science Curriculum	The skill of the trainer/facilitator influenced development in LoU.
1982	Horowitz	*n* = 41	Descriptive	Library Services	A lack of change agents, a weak resource system, and poor communication influence implementation.
1983	Huling et al.	NA	Correlational	Various	Principal change facilitator style (p =.001) and collaboration (p =.009) influenced overall LoU.
1988	Evans & Hopkins	*n* = 30	Causal Comparative	Curriculum	Variance in curriculum utilization can be accounted for by the prevailing school climate and the nature of the individual teacher.
1993	Roberts	*n* = 18	Descriptive	Collaboration	There is a relationship between LoU and commitment to collaboration by teachers over time, developmental levels, experience with the innovation, and cultural factors within the schools.

Table 5.2. *continued*

Year	Author(s)	Sample	Design	Innovation	Findings
1995	Hope	*n* = 16	Longitudinal	Computers	Although there was limited movement in LoU, the author found that a supportive, nonpunitive environment with no pressure on teachers to become users of technology promoted teacher use of technology.
1999	Geijsel, van den Berg, & Sleegers	*n* = 64	Correlational	Going to School Together	Schools that more readily adopted an innovation shared a common vision, had a transformational leader who took responsibility for facilitating joint goals and stimulating a culture of collaboration, had leaders who radiated dedication and demonstrated understanding and respect for personal feelings, had leaders who fostered greater collaboration, and had leaders who facilitated teacher participation in decision making; everyone shared a common need and desire for personal growth as well as continued schooling and training.
1999	Hall et al.	*n* = 102 & 106	Longitudinal	Constructivist Teaching	The following factors must be in place to support systemic change: strong strategic leadership, skilled change facilitators, a worthwhile innovation, and systematic data gathering about implementation.
1999	Krasner	*n* = 8	Descriptive	Prosocial Skills Curriculum	Those with higher LoU had extensive knowledge and expertise, had a greater sense of responsibility for student success, integrated planning and assessment, evaluated learning materials, expressed a greater need to teach students prosocial skills, and spent more time on social skills interaction.

Year	Author(s)	Sample	Design	Innovation	Findings
2001	Gershner	$n = 49$	Correlational	Internet to Support Instruction	Using the Wilcoxon Signed Ranks Test, differences are significant to $p = .001$.

within the school that promoted a supportive, nonpunitive environment with no pressure on teachers to become users of the innovation actually promoted teacher use of the innovation (Hope, 1995; Roberts, 1993). Horowitz (1982) further recommended a strong resource and communication system be used by the institution to further support the change process.
Strong leadership was found to be a common thread throughout a number of studies. To successfully support the implementation of an innovation and the change process, principals and other school leaders need to be proactive supporters of the innovation (Loucks & Hall, 1979). There is a need for positive endorsement; passive support does not achieve use or change

(Evans & Hopkins, 1988; Hopkins, 1990). Principals who provided a vision and worked to help meet that vision, or those who were managers, had greater success in getting their teachers to adopt an innovation (Schiller, 1991, 2000); additionally, utilization of more interventions by the principal resulted in higher Levels of Use by teachers (Pratt, Thurber, Hall, & Hord, 1982; Schiller, 1991, 2000).

Implementation of an innovation is different in different schools, primarily because of the actions and concerns of the principal (Hall, Hord, & Griffin, 1980). The principal's change facilitator style had a strong impact on eventual adoption of an innovation by the majority of teachers in a building (Huling, Hall, Hord, & Rutherford, 1983). Hall et al. (1980) hypothesized that a principal's concerns and change facilitation behaviors influence the arousal and resolution of teacher concerns and the teachers' LoU. In the end, a skilled change agent is necessary for institutionalizing an innovation (Hall et al., 1999; Horowitz, 1982), and as those who are facilitating the change process gain in skill, they become more effective in helping teachers reach a routine LoU (Loucks & Melle, 1980).

As stated earlier, the nature of the individual teacher has a huge impact on their eventual implementation of an innovation (Evans & Hopkins, 1988; Hopkins, 1990). In combination with a school climate that is supportive, a teacher who is self-actualizing was more willing to try new teaching methods and to adopt a new innovation. Of further note, there is a relationship between degree of implementation of a new innovation and commitment to the innovation by teachers over time, developmental levels, and experience with the innovation (Roberts, 1993). Krasner (1999) found those with higher LoU had extensive knowledge and expertise, had a greater sense of responsibility for student success, were integrating planning and assessment, evaluated learning materials, expressed a greater need to teach students skills and concepts, and spent more time on guided practice with students. In addition, Marcais (1995) found that teaching style had an impact on eventual implementation, as did the individual teacher's level of creativity (Falkenberg, 2002).

Interestingly, the components of an innovation over which teachers had total control were the most successfully implemented (Loucks & Melle, 1980). No matter the innovation, however, teachers at different levels required different activities and different interventions to support the adoption and implementation of the innovation (Schiller, 1991, 2000).

Finally, evaluation was deemed to play a major role in the change process and the eventual institutionalization of an innovation. Researchers recommended that data, in particular LoU and SoC data, be collected systematically throughout the implementation of an innovation (Hall et al., 1999; Pratt et al., 1982). An approach that uses multiple data sources, combining both quantitative and qualitative data analysis procedures to assess the quality of the implementation and the resulting student learning, was more effective in promoting implementation and school improvement (Huberman & Miles, 1984).

Assessing Interventions

Similarly, numerous studies examined the effect of various interventions on the eventual adoption and use of an innovation (see Table 5.3). These interventions included training, one-on-one support, peer coaching, and so forth and the effect of their use on the eventual implementation of a specific innovation. The LoU instrument was used to track the implementation process so that the effectiveness of the interventions could be assessed. These studies provide additional insight into best practices that can be used to facilitate the change process.
A number of researchers examined the use of training as a tool to support the implementation of an innovation (Basinger, 2000; Baugh, 1994; Biery, 1992; Bouchelle, 2002; Carpentier, Piziak, Bratcher, & Hejl, 1990; Dudderar, 1997; Poplos, 1999; Richmond-Cullen, 1999; Zigarmi, 1979). All found training to be a valuable tool, with most first-time users progressing to at least LoU III Mechanical Use or LoU IVA Routine. In a comparison of formal classes and individualized instruction, Carpentier et al. (1990) determined that increase in LoU was not significantly different in either setting. Follow-up evaluations indicated that retention of skills and motivation were excellent and LoU continued to improve. Researchers (Carpentier et al., 1990) surmised that classroom education is technically equivalent to, more cost-effective than, and possibly more conducive to learning than individualized instruction. Even with the level of support provided through training, Zigarmi (1979) found that after 3 years of training, 19% of the participants remained nonusers. To reduce the number of nonusers, the researcher recommended that individualized interventions be implemented and acceptable patterns of use of the innovation be defined.

Baugh (1994) found that first-time users were not as likely to be very sophisticated in their use of the innovation. Confounding variables such as equipment, supplies, and classroom management were likely to impede LoU. Other barriers to implementation have been identified as time, differences in personal priorities of the teachers, demands to meet new requirements, and academic demands (Krasner, 1999). Direct, intensive follow-up and implementation of interventions designed to address barriers seemed to support growth in LoU (Richmond-Cullen, 1999).

Likewise, by using LoU and SoC data to support concerns-based professional development by

assessing staff development needs, planning and delivering relevant staff development activities, evaluating efforts, and assessing the total effectiveness of the implementation effort, other researchers (Leary, 1983; Neugebauer, 1991) were able to positively affect LoU. Neugebauer (1991) determined the differences between the experimental group who had participated in concerns-based decision making and the control group to be significant ($p < .0001$).

Other researchers examined other interventions. Gevirtz (1993) compared two different interventions, job search training and negative behaviors. Although 18 teachers changed their LoU, there was no significant statistical difference between interventions. Wineburg (1995) found that only those teachers who participated in peer coaching to support their implementation of cooperative learning reached LoU IVB Refinement or LoU V Integration.

Effects of an Innovation

Only a few studies have been done that evaluate the effects of an innovation based on LoU (see Table 5.4). In these studies, the researchers used the LoU interview protocol to identify participants who were using the innovation and those who were not using it, essentially creating experimental and control groups using the instrument. Comparisons were then made between outcomes derived by users and nonusers of the innovation. Comparisons were also made between the outcomes of users operating at different LoU. Using LoU to identify users and nonusers of an innovation and then using this information to assist in assessing the impact of an innovation is one of the most powerful uses of the LoU instrument. Researchers who used LoU in this fashion found that if an innovation was being used at LoU IVA Routine or higher, there were greater outcomes attributed to an innovation (Francq,

Table 5.3. Studies Related to the Effect of Interventions on the Level of Use

Year	Author(s)	Sample	Design	Innovation	Findings
1979	Zigarmi	$n = 42$	Longitudinal	Glasser's Reality Therapy	By the end of the third phase of training, 73% of the subjects were at LoU IVA Routine or higher.
1983	Leary	$n = 12$	Longitudinal	K–6 Provincial Science Curriculum	Concerns-based staff development resulted in 34% increasing their use of the innovation.
1990	Carpentier et al.	$n = 40$	Experimental	Diabetes Therapeutic Regimen	Retention of skills and motivation were excellent and LoU continued to improve.
1991	Neugebauer	$n =$ 21(E) $n =$ 21(C)	Experimental	Peer Coaching	Within the experimental group, all but one individual moved to LoU III Mechanical Use or higher. There was little movement among the control group. Differences were found to be significant at $p < .0001$.

Table 5.3. *continued*

Year	Author(s)	Sample	Design	Innovation	Findings
1992	Biery	*n* = 4	Case Study	Pennsylvania Literacy Network Seminar 4	After 30 hours of training and a 1-year time period, 25% were at LoU III Mechanical Use and 75% at LoU IVA Routine.
1993	Gevirtz	*n* = 22(I-1) *n* = 25(I-2)	Quasi-Experimental	Job Search Instruction	There were no significant statistical differences between interventions.
1994	Baugh	*n* = 10	Descriptive	Internet to Support Instruction	After participating in the training program, 10% were at LoU IVB Refinement and 90% at LoU IVA Routine.
1995	Wineburg	*n* = 12(E) *n* = 10(C)	Causal Comparative	Cooperative Learning	Only those teachers who participated in peer coaching reached LoU IVB Refinement or LoU V Integration.
1997	Dudderar	*n* = 10	Quasi-Experimental	Early Childhood Mathematics Curriculum	After training, 60% of the teachers who had not been using the innovation had become users.
1999	Poplos	*n* = 4(E) *n* = 4(C)	Experimental	Integrating Technology	After receiving professional development, 75% of the experimental group was at LoU III Mechanical Use or higher.
1999	Richmond-Cullen	*n* = 7	Case Study	Integrating Art Into the Curriculum	After participating in a 4-week summer institute, all participants became users of the innovation.
2000	Basinger	*n* = 12	Longitudinal	Computers	After participating in the course, 34% had moved from nonuse to use and 25% had increased to LoU IVB Refinement.
2002	Bouchelle	*n* = 9	Descriptive	Interactive Science Kit	Those who had completed training in at least three science kits were evaluated to be at LoU IVA Routine.

1983; George, Hall, & Uchiyama, 2000). This includes positive changes in student attitudes (Wills, 1988), behavior (Dirksen, 1988), and achievement (Mitchell, 1988b). Additionally, teachers at LoU III Mechanical Use had the lowest student outcomes.

Assessing Implementation

The bulk of the research done using the LoU interview protocol has assessed implementation of an innovation. As we have moved into research that focuses on school improvement rather than just the implementation of a single innovation, assessing the implementation of innovations that are part of a larger school improvement plan has become important. The studies cited here (see Table 5.5) focused on assessing the degree to which an innovation that is part of a larger improvement project was implemented within a particular organization. These studies provide a broad view of the innovations and situations where the LoU instrument has been used successfully in its primary role of assessing the quality and fidelity of the implementation. As expected, a number of studies that reported on first-time users of an educational innovation found that more than half of them were at LoU III Mechanical Use. Movement to higher LoU requires time, resources, leadership, and training (Dirksen, 2002; Gilbert, 2000; Graber, 2005; Hall et al., 1978; Marsh, 1987; Newhouse, 1999; Prugh, 2003, 2004; Sungkatavat, 1984; Thornton & West, 1999; Yarberry, 2003, 2004). Huberman and Miles (1984) found that large-scale participation during early stages of a change effort was counterproductive at times. Where there are sufficient resources, leadership, and training, LoU ratings indicated that participants were adjusting their behaviors to maximize the effects of the innovation (Hall et al., 1978). Across the board, however, teachers indicate a continued need for additional practice and review of skills with a given innovation to continue to achieve automaticity in use of techniques related to the innovation.

Those who evaluated the implementation of a specific curriculum (Clark, 1986; Dalton, 1990; Doering, 2002; Gilbert, 2000; Gwele, 1996; Marsh, 1987; Sungkatavat, 1984), ranging from biology to dance, found various degrees of actual implementation. Even where implementation of innovation is mandated, there is a fair degree of variation in LoU and how an innovation is implemented (Clark, 1986; Dalton, 1990; Gwele, 1996; Sungkatavat, 1984). In many cases the innovation seemed to have been redefined by the participants (Clark, 1986; Dalton, 1990; Gwele, 1996; Stamos, 1996; Sungkatavat, 1984). A number of teachers cited in these studies were adjusting the innovation to better meet their needs, the teaching situation, or their students' needs (Clark, 1986; Dalton, 1990; Dirksen, 2000; Gwele, 1996; Marsh, 1987; Stamos, 1996).This causes major problems when a school or district is working to implement an innovation where a high degree of fidelity to the innovation's critical attributes is necessary to maximize impact on student learning. In these situations, the Innovation Configuration (IC) dimension of CBAM would be useful.

While a number of factors can positively or negatively impact the implementation of an innovation, Newhouse (1999) found LoU to be strongly correlated with the nature of the curriculum. If the curriculum directly supports the use of a particular innovation, it is much more likely to be implemented. If, however, an innovation is merely an addendum to the curriculum, it is less likely to be implemented on

Table 5.4. Studies Evaluating the Effects of an Innovation

Year	Author(s)	Sample	Design	Innovation	Findings
1983	Francq	*n* = 44	Correlational	SAPA II	Students of teachers operating at LoU IVA Routine or LoU IVB Refinement realized greater science process outcomes than did students taught by nonusers or Mechanical Use teachers.
1988	Dirksen	*n* = 371	Correlational	Integrating Technology	Teachers who were at a higher LoU and using the technology to support generative learning projects reported greater effect on student behaviors associated with high achievement.
1999	Hall et al.	*n* = 102 & 106	Longitudinal	Constructivist Teaching Strategies	Higher student outcomes were associated with higher LoU of constructivist teaching strategies to teach mathematics.
1986	Mitchell	*n* = 118	Correlational	Evaluation Data	Although high-achieving schools used evaluation data at a higher LoU, no significant difference was found between LoU and achievement scores.
1988b	Wills	*n* = 149	Causal Comparative	Interdisciplinary Teaming	Student self-concept was higher in "user" schools.

a broad basis. Additionally, innovations were used more by teachers who used student-centered approaches to instruction. Most teachers need 2–3 years' experience with an innovation to become good users of the innovation, progressing beyond LoU III Mechanical Use (Dirksen, 2002; Dirksen & Tharp, 1997, 1999; Graber, 2005; Marsh, 1987; Newhouse, 1999; Thornton & West, 1999). Clark (1986) also expressed the view that the attitude of the individual teacher must not be overlooked if the implementation of an innovation is to be successful. Teacher attitude is strongly impacted by the educational climate; in her studies with special education teachers, Graber (2005) found that because of cutbacks in allocations and personnel, teachers have been forced to rethink how they teach and meet the needs of their students. These cutbacks have raised a number of concerns for educators: there is no designated time for collaboration; follow-through on suggested modifications is weak; reduction in staff is having a negative effect on the classroom and teacher attitudes; and a general feeling of frustration exists because of lack of time to implement innovations appropriately. In this age of educational accountability and comprehensive reform with a focus on student achievement, these issues, and their impact on the change process, are key to the successful implementation of educational innovations.

Table 5.5. Studies That Focus on the Levels of Use as a Tool for Implementation Assessment

Year	Author(s)	Sample	Design	Innovation	Findings
1978	Hall et al.	Various	Descriptive	Dean's Grant Projects (various)	LoU ratings indicate that project directors were functioning in a highly effective fashion, adjusting their behaviors to maximize the effects of the project.
1984	Sungkatavat	$n = 41$	Descriptive	Biology Curriculum	83% of the subjects used the curriculum with some variation in implementation.
1986	Clark	$n = 23$	Descriptive	Social Studies Curriculum	Teachers have modified and added materials to make the curriculum their own.
1987	Marsh	$n = 10$	Descriptive	Social Studies Curriculum	Although there was some movement from LoU III Mechanical Use, the fidelity of the implementation is questionable because the developers did not provide any explicit standards or directions.
1990	Dalton	$n = 40$	Causal Comparative	Nursing Conceptual Models	Nursing conceptual models were perceived and used differently by nursing faculty within and across sample nursing programs.
1996	Gwele	$n = 47$	Causal Comparative	Comprehensive Basic Nursing Program	Nursing educators in three out of four nursing colleges were still functioning below LoU III Mechanical Use.
1996	Stamos	$n = 7$	Case Study	Computers	Although all teachers interviewed were users of the technology, they had redefined the innovation.
1997	Dirksen & Tharp	$n = 27$	Descriptive	Integrate Technology	Only 26% of the entry-level teachers were prepared to integrate technology into their classroom without additional support.

Table 5.5. *continued*

Year	Author(s)	Sample	Design	Innovation	Findings
1999	Dirksen & Tharp	*n* = 23	Descriptive	Integrate Technology	As expected, the majority of first-time users were at LoU III Mechanical Use or above.
1999	Newhouse	*n* = 23	Correlational	Laptop Computers	Few teachers were able to implement the computers.
1999	Thornton & West	*n* = 102, 106	Longitudinal	Constructivist Teaching Practices	64% of the subjects were at LoU IVA by the end of the second year of the project.
2000	Dirksen	*n* = 12	Descriptive	Various Reading Programs	All participants were users of the innovation, but with varying quality.
2000	Gilbert	*n* = 16	Descriptive	Louisiana Systemic Initiative Program	All teachers interviewed were users of the innovation.
2002	Dirksen	*n* = 16	Descriptive	Laptop Initiative	75% of those interviewed were at LoU III or higher.
2002	Doering	*n* = 24	Descriptive	Dance Curriculum	Although the curriculum is mandated, 58% of the teachers interviewed were nonusers of the curriculum.
2003	Prugh	*n* = 9	Descriptive	Adventure Center	All subjects interviewed were users of the innovation.
2003	Yarberry	*n* = 10	Descriptive	Crisis Prevention and Intervention	Use ranged from LoU 0 Nonuse to LoU V Integration.
2004	Moldenhauer	*n* = 4	Descriptive	Multisensory Communication Training	75% were at LoU III Mechanical Use; 25% were at LoU IVB Refinement.
2004	Prugh	*n* = 10	Descriptive	Autism Diagnostic Observation Schedule	The participants ranged from LoU II Preparation to LoU III Mechanical Use, with only one participant at LoU III Mechanical Use.
2004	Yarberry	*n* = 25	Descriptive	Colorado Performance Based Standard Six	Use ranged from LoU II Preparation to LoU VI Renewal; only one participant was a nonuser.
2005	Graber	*n* = 16	Descriptive	Cognitive Coaching and Differentiated Instruction	25% were nonusers at LoU II Preparation, and 75% were users ranging from LoU III Mechanical Use to LoU V Integration.

Chapter Six
Conclusion

When the LoU instrument and CBAM were developed, change in education focused on implementing specific techniques, instructional methods, teaching tools, or other more clearly defined innovations. Over the past 30 years, educational change has made several transitions. Today, change incorporates a much more comprehensive vision for school improvement. We have transitioned from clearly defined, easily delineated innovations to complex, multifaceted innovations and school improvement projects. Additional focus on accountability and student achievement through NCLB, has made it even more important to assess the extent to which an innovation is being implemented with a high degree of fidelity. Once the classroom door closes, many teachers alter an innovation so that it better meets their needs (Clark, 1986; Dalton, 1990; Gwele, 1996; Stamos, 1996; Sungkatavat, 1984). Such adaptation in some cases decreases the fidelity of the implementation to the point that the critical attributes of the innovation are no longer being implemented. LoU and Innovation Configurations allow us to assess this condition.

The LoU instrument has been used successfully to evaluate the implementation not only of single, clearly defined innovations (Clark, 1986; Dalton, 1990; Doering, 2002; Gilbert, 2000; Hall et al., 1978; Marsh, 1987; Prugh, 2004; Sungkatavat, 1984), but also of more complex or multiple innovations (Dirksen, 2002; Dirksen & Tharp, 1997, 1998; Graber, 2005; Gwele, 1996; Newhouse, 1999; Prugh, 2003; Stamos, 1996; Thornton & West, 1999; Yarberry, 2003, 2004; Wizniewski et al., 2005). In the current age of educational reform and accountability, it is essential that we use a multifaceted approach to assess staff and organizational development as we implement school improvement plans and other initiatives designed to enhance student learning. Such initiatives include far-reaching systemic reform policies such as NCLB, standards-based or whole-school programs such as Success for All, more specific approaches such as Multi-Sensory Reading, Cognitive Coaching, and even a wide range of technologies.

The LoU instrument proved to be an excellent tool for assessing the implementation of the more well-defined innovations of the 1970s and their effects on student achievement (Cantor, 1982; Dominguez et al., 1980; George & Rutherford, 1978; Marsh, 1984; Rutherford, 1981; Rutherford & Loucks, 1979; Stedman, 1984). It has also been shown to be effective in assessing implementation of the more comprehensive innovations educators are asked to implement today (Dirksen, 1998; Francq, 1983; Hall et al., 1999; Mitchell, 1988a; Wills, 1999).

The LoU instrument also gives evaluators a tool with which they can anchor a mixed-evaluation design that looks at qualitative as well as quantitative measures to assess the effect of interventions designed to promote the use of an innovation (Basinger, 2000; Baugh, 1994; Biery, 1992; Bouchelle, 2002; Carpentier et al., 1990; Dudderar, 1997; Gevirtz, 1993; Leary, 1983; Neugebauer, 1991; Poplos, 1999; Richmond-Cullen, 1999; Wineburg, 1995; Zigarmi, 1979). Identifying the conditions, contexts,

characteristics, and formats that are more likely to have a positive impact on student learning can be useful in determining which practices contribute the most to effective professional development or how professional development affects student learning (Guskey, 1997). Research that identifies "overall" or "general" effects often glosses over critical interactions and provides little direction. Such research tends to focus on issues of quantity, neglecting issues of quality in the process. Quantity indicators that address issues of *what, when*, and *how many* are, of course, important to assessing the effectiveness of innovations designed to improve student learning, but are insufficient in many cases.

Also, as discussed previously, many times an innovation is implemented with limited attention to fidelity (Clark, 1986; Dalton, 1990; Gwele, 1996; Sungkatavat, 1984). Consequently, when the effectiveness of that same innovation is assessed, a result of "no significant difference" is returned. The result is hardly surprising when the researcher has not assessed whether the innovation was implemented with any degree of fidelity. Applying the LoU instrument, researchers can identify those educators who are actually implementing an instructional intervention at an appropriate LoU. Once use is differentiated, the impact of the innovation on student achievement, behavior, or attitudes can be more accurately assessed.

Unless educational programs are implemented (LoU III–VI) with a focus on student learning (LoU IVA, IV B, V, or VI) and encompass both individual and organizational change, positive results cannot be sustained. The innovation needs to be valuable to the learning environment and the curriculum (Hall et al., 1999; Newhouse, 1999); it needs to represent best practice and be appropriately implemented and clearly linked to student learning. As evidenced by the research addressed in the review of the literature in Chapter 5, the LoU instrument gives evaluators a means to collect data, which, when linked with other measures, is a powerful tool to observe the change process and assess the extent of implementation of an innovation. The LoU also allows evaluators, researchers, and change leaders to assess the effect of the innovations designed to support student learning.

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Appendix A
The Basic Interview Protocol

Question	Purpose
Are you using the innovation?	To distinguish between users and nonusers; to break LoU 0–II from LoU III–VI
IF YES	
What do you see as the strengths and weaknesses of the innovation in your situation? Have you made any attempt to do anything about the weaknesses?	To probe Assessing and Knowledge Categories.
Are you currently looking for any information about the innovation? What kind? For what purpose?	To probe Acquiring Information Category.
Do you ever talk with others about the innovation? What do you tell them?	To probe Sharing Category and check Decision Point E.
What do you see as being the effects of the innovation? In what way have you determined this? Are you doing any evaluating, either formally or informally, of your use of the innovation? Have you received any feedback from students? What have you done with the information you get?	To probe Assessing Category.
Have you made any changes recently in how you use the innovation? What? Why? How recently? Are you considering making any changes?	To distinguish between LoU III (user-oriented changes), LoU IVB (impact-oriented changes), and LoU IVA (no or routine changes); to probe Status Reporting and Performing Categories.
As you look ahead to later this year, what plans do you have in relation to your use of the innovation?	To probe Planning and Status Reporting Categories.

Question	Purpose
Are you working with others (outside of anyone you may have worked with from the beginning) in your use of the innovation? Have you made any changes in your use of the innovation based on this coordination?	To separate LoU V from III, IVA, and IVB. If a positive response is given, LoU V probes (below) are used.
Are you considering making or planning to make major modifications or to replace the innovation at this time?	To separate LoU VI from III, IVA, IVB, and V.
LoU V Probes	
How do you work together? How frequently?	To verify Decision Point E; to probe Performing Category.
What are the strengths and the weaknesses of this collaboration for you?	To probe Knowledge Category.
Are you looking for any particular kind of information in relation to this collaboration?	To probe Acquiring Information Category.
When you talk to others about your collaboration, what do you share with them?	To probe Sharing Category.
Have you done any formal or informal evaluation of how your collaboration is working?	To probe Assessing Category.
What plans do you have for this collaborative effort in the future?	To probe Planning Category.
Can you summarize for me where you see yourself right now in relation to the use of the innovation? (Optional Question)	To get a concise picture of the user's perception of his/her use or nonuse.

Question	Purpose
IF NO	
Have you made a decision to use the innovation in the future? If so, when?	To separate LoU 0 from I; to probe Status Reporting, Planning, and Performing Categories; to separate LoU I from II.
Can you describe the innovation for me as you see it?	To probe Knowledge Category.
Are you currently looking for any information about the innovation? What kinds? For what purposes?	To probe Acquiring Information Category.
What are the strengths and weaknesses of the innovation for your situation?	To probe Assessing Category.
At this point in time, what kinds of questions are you asking about the innovation? Give examples if possible.	To probe Assessing, Sharing, and Status Reporting Categories.
Do you ever talk with others and share information about the innovation? What do you share?	To probe Sharing Category.
What are you planning with respect to the innovation? Can you tell me about any preparation or plans you have been making for the use of the innovation?	To probe Planning Category.
Can you summarize for me where you see yourself right now in relation to the use of the innovation? (Optional Question)	To get a concise picture of the user's perception of his/her use or nonuse.

Question	Purpose
Past-User Questions	
Why did you stop using the innovation? Can you describe for me how you organized your use of the innovation, what problems you found, and what its effects appeared to be on students? When you assess the innovation at this point in time, what are its strengths and weaknesses for you?	

Appendix B
The LoU Rating Sheet

LEVEL OF USE RATING SHEET (CBAM, 1975)

Tape #: Site: Interviewer:

Date: / / I.D.#: Rater:

Level	Knowledge	Acquiring Information	Sharing	Assessing	Planning	Status Reporting	Performing	Overall LoU
Nonuse	0	0	0	0	0	0	0	0
Decision Point A								
Orientation	I	I	I	I	I	I	I	I
Decision Point B								
Preparation	II	II	II	II	II	II	II	II
Decision Point C								
Mechanical Use	III	III	III	III	III	III	III	III
Decision Point D-1								
Routine	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA
Decision Point D-2								
Refinement	IVB	IVB	IVB	IVB	IVB	IVB	IVB	IVB
Decision Point E								
Integration	V	V	V	V	V	V	V	V
Decision Point F								
Renewal	VI	VI	VI	VI	VI	VI	VI	VI
User is not doing:	ND	ND	ND	ND	ND	ND	ND	
No information in interview:	NI	NI	NI	NI	NI	NI	NI	

Is the individual a past user? Yes No If so, what was their last LoU? _____

How much difficulty did you have in assigning this person to a specific LoU? None 1 2 3 4 5 6 7 Very much

Comments about interviewer—

General comments—

Appendix C
Guidelines for Rating Levels of Use Categories

Knowledge

Unlike the other Categories, the Knowledge Category does not tap behaviors of the innovation user. Rather, it determines what the user knows about the innovation and its use. For example, the person at LoU 0 Nonuse may have no knowledge or have inaccurate knowledge about the innovation, whereas the individual at LoU I Orientation will possess general information about the innovation, such as origin, characteristics, and implementation requirements. Someone further along in implementation, such as an individual at Level IVB Refinement, will not only know about effects of use of the innovation with regard to student performance, but also will know about adaptations and refinements made to the innovation and understand why these changes were made.

It is important to note that application of knowledge may result in behaviors that provide evidence for some of the other categories. Here are some guidelines for ascertaining the LoU Knowledge Category:

LoU 0—The individual at LoU 0 has limited knowledge or no knowledge about the innovation. He or she may not even know the correct name of the innovation.

LoU I—The individual at LoU I has general knowledge about the innovation, its purpose, and its applications.

LoU II—The individual at LoU II knows logistical requirements, necessary resources and timing for initial use of the innovation, and details of initial experiences for students. This user will be able to describe the innovation in more detail than someone at Level I and should be able to provide details about the roles of both user and students when the innovation is in use and the kinds of resources and plans the user has developed for use. A typical response may be something along the lines of, "I know what I'll need in the way of materials and have a good idea how to begin to use the innovation."

LoU III—The individual at LoU III knows on a day-to-day basis the requirements for using the innovation. He or she is generally more knowledgeable about short-term activities and effects on students than long-range activities and effects of the use of the innovation. This user can describe in detail what use will require in the near future, normally a week or less, but does not know specifically what he or she will be doing with it in the longer-range view. A typical response may be, "I'm not sure what I'll be doing with this innovation next semester. I just know what I need to do with it tomorrow!"

LoU IVA—The individual at LoU IVA knows both short-term and long-term requirements for use of the innovation and knows how to use the innovation with minimal effort or stress. A typical response

might be, "I know how to use the innovation without difficulty. I can anticipate how the students will react as well as what they are likely to gain in the long run when I use the innovation."

LoU IVB—The individual at LoU IVB understands the cognitive and affective effects on students as a result of the innovation and sees alternative ways to use the innovation for increasing student outcomes. This person can describe changes that could be or are being made in the use of the innovation and what is known about the effects of the innovation on students that prompted changes. A typical response might be, "I've learned how to use the innovation to go over the concepts the students need and to excite them about learning. I know several different ways to approach using the innovation depending on the needs of my students."

LoU V—The individual at LoU V knows how to coordinate his or her own use of the innovation with that of colleagues to provide a collective impact on students. A typical response could be, "I know what my colleagues are doing with the innovation and how we work best together to increase student learning."

LoU VI—The individual at LoU VI knows of alternatives that could be used to change or replace the present innovation that would improve the quality of outcomes of its use. A typical response might be, "I now know of several other innovations that might enhance the use of the innovation we are now using. By changing the way we are using the current innovation, we could improve student learning."

Acquiring Information

Whether a user solicits information about the innovation and the types of information he or she solicits reflects the individual's LoU. This category is an active category; in other words, it is the kind of information that the user is actively soliciting and for what purpose that helps determine the LoU for this category.

At each LoU a person will be looking for certain kinds of information. For example at LoU 0, the individual takes little or no action to get information. At LoU I, the individual seeks descriptive materials about the innovation. Persons at LoU VI will gather information that could be used to make major adaptations to the use of the innovation. Keep in mind that information can be obtained from many sources besides print.

LoU 0—The individual at LoU 0 takes little or no action to solicit information beyond reviewing material that may have been passed on to him or her. The person at this level may report something like, "I'm not looking for anything about the innovation. I've got too much to do."

LoU I—The individual at this level seeks descriptive material about the innovation and seeks opinions and knowledge of others through discussions, visits, or workshops. Someone at LoU I may report, "I'm looking for materials related to the innovation and am considering using it in my classroom."

LoU II—The individual who is at LoU II seeks information and resources specifically related to preparation for use of the innovation. The individual at this level may have comments along the lines of, "I have read some material about using the innovation at the middle school level, but that doesn't tell me all that I will need to know before we begin using the innovation next semester. I'm still looking for additional information about using the innovation for the instruction of sixth graders."

LoU III—Someone at LoU III solicits management information about such things as logistics, scheduling, and ideas for reducing the amount of time and work required of the user. The individual at this level may respond with, "I have talked with a colleague to see if she has ideas about how to better organize these lessons. The manual helps, but it is still rough…"

LoU IVA—The person at LoU IVA makes no special efforts to seek information as part of ongoing use of the innovation. He or she may not actively solicit information, but is reading information that comes across his or her desk and attending the required workshops and meetings related to implementing the innovation. This individual's response may be similar to, "I've collected all the ideas and materials I need to use the innovation right now."

LoU IVB—The individual at this level solicits information and materials that focus specifically on changing the use of the innovation to improve student outcomes. A person at LoU IVB may respond, "I'm trying to find out from discussion and a workshop I took last week about how to increase cognitive skills through the use of the innovation. Though students enjoy the lessons and have learned a great deal, I want information on how to adjust the lessons to better meet their needs."

LoU V—An individual at LoU V solicits information and opinions for the purpose of collaborating with others in the use of the innovation. A typical response for someone at this level might be, "I am finding out from other faculty members what they are doing and planning so I can better coordinate how we use the innovation to motivate the students and improve their learning."

LoU VI—The person at LoU VI seeks information and materials about other innovations as alternatives to the present innovation or for making major adaptations to the current innovation, with a focus on student achievement or outcomes. An individual at this level might report, "I am reading research literature related to innovations in the same area as the one we are using, but that might result in better student outcomes."

Sharing

The Sharing Category focuses on what kinds of things about the use of the innovation the user tells others. Individuals at different levels will discuss different aspects of their use of the innovation. For example, the individual at LoU I might tell a colleague about what he or she has learned in general, while someone at LoU III would discuss management issues related to the challenges of using the innovation.

LoU 0—Someone at LoU 0 would not communicate with others about the innovation beyond possibly acknowledging that the innovation exists. An individual at this level may say something like, "I teach AP chemistry and sure, I share ideas about teaching science whenever I get a chance, but we just don't talk about the innovation."

LoU I—Individuals at LoU I show that they are considering its use. They might share some of what they have learned. They may say, "This innovation seems to help ELL students more, but I am not yet sure it's worth it."

LoU II—Persons rated LoU II discuss resources needed for the initial use of the innovation and join others in pre-use training and in planning for resources, logistics, schedules, etc. A typical response from someone at LoU II might be along the lines of, "I have ordered the student materials. Right now I'm trying to figure out how to best organize them."

LoU III—Individuals at this level share information about management and logistical issues related to the use of the innovation. Resources and materials are often shared for the purposes of reducing management, flow, and logistical problems that might stem from implementing the innovation. A person at LoU III might report, "Every day I end up with students hanging around one station, waiting their turn, because I didn't anticipate how long it would take them."

LoU IVA—An individual at LoU IVA will not go out of his or her way to share. If the topic of the innovation comes up in conversation, he or she might say something similar to, "Other faculty members and I occasionally talk about how we are implementing the innovation, but I just tell them it is working fine for me."

LoU IVB—Someone at LoU IVB shares his or her own methods of modifying use of the innovation to improve student outcomes. An individual at this level might say, "I have found a new piece of software that has really helped the ELL students."

LoU V—An individual at LoU V shares efforts to increase student achievement through collaboration with others to increase the innovation's effectiveness. It is not the actual discussion between collaborators that this category focuses on, but what is mentioned about the collaboration with others. For example, someone at LoU V might remark, "Our talks as a team have enabled us to build on skills in a way that helps us better meet the standards for the fifth-grade students."

LoU VI—Individuals share what they are learning about major alternatives to or replacements for the current innovation. A response indicative of this LoU might be similar to, "In my discussions with Mary, I have told her about the different approach I found on the Web."

Assessing

The Assessing Category includes informal observation, examination, and consideration of various aspects of innovation use as well as more systematic data collection. Nonusers and users will reflect upon what they are doing or not doing, relative to their engagement with the innovation. The focus here is on what is being assessed and what is being done as a result of the assessment. Assessment can examine the potential or actual use of the innovation or some aspect of it.

LoU 0—The person at LoU 0 takes no action to analyze the innovation, its characteristics, possible use, or consequence of use. Possible comments could include those similar to, "I couldn't evaluate the innovation. I really have no basis for an opinion." Or comments might be along the lines of, "I'm not in a position to evaluate the innovation yet. We haven't been really using it yet. I suppose it has some advantages, but I'm not sure what they would be."

LoU I—At this level, the individual analyzes and compares materials, content, requirements for use, evaluation reports, potential outcomes, strengths, and weaknesses for the purpose of making a decision about the use of the innovation. A typical response might be, "I'm reading some reports about the innovation, studying the pros and cons about implementing the innovation, and trying to make up my mind if it would work in my classroom."

LoU II—An individual at LoU II analyzes detailed requirements and available resources for initial use of the innovation. The person at this level might report, "As the day approaches when I'll first use the innovation, most of my thoughts have to do with checking which resources I'll need for the first day of use."

LoU III—Someone at LoU III examines his or her own use of the innovation with respect to the problems of logistics, management, time, schedules, resources, and general reactions of students. The individual's response could be similar to, "My evaluation of my use of the innovation hasn't progressed beyond the logistical yet," or "Assessing the innovation I'm using at this time is more a matter of judging what will be needed for the next day. Of course I do try to judge how things are working out so the same mistakes aren't repeated."

LoU IVA—The individual rated at LoU IVA limits evaluation activities to those administratively required and to those done routinely. The person may perform evaluations but each time they use the innovation gives no indication that changes are based on or are intended to be based on information gathered. At this level, the user may say, "Evaluation of the innovation is conducted by the administration. Of course, I cooperate with them."

LoU IVB—At this level, the individual assesses use of the innovation for the purpose of changing current practices to improve student outcomes. Someone at LoU IVB may report, "A detailed assessment instrument along with discussions with individual students prompted me to change my use of the innovation so that all students are now getting it."

LoU V—Persons at LoU V appraise collaborative use of the innovation in terms of client outcomes and strengths and weaknesses of the integrated effort. For example, at this level teachers might realize, "Kids coming to our team from a lower-age-level team in our school progress right on up the ladder of the skills we planned schoolwide. There is no disruption in their learning. However, kids who are new to our school are at a disadvantage since they don't have the same background, we can't work with their former teachers, and we don't know what they have done."

LoU VI—Individuals at LoU VI analyze advantages and disadvantages of major modifications or alternatives to the present innovation. They might report, "I'm analyzing several innovations from a feasibility point of view, and am looking at research reports that provide some indication of student outcomes. I'm considering using another innovation on a pilot basis before making a decision about replacement of the one we use."

Planning

The Planning Category recognizes the efforts people make in planning for future innovation use. Users design and outline short-range and/or long-range steps to be taken during the implementation process, which may include aligning resources, scheduling activities, and meeting with others to organize or coordinate use of the innovation. Not only are the kinds of plans made important in rating this category, but also the intent behind the plans. For example, is the person planning to make things easier for him or herself, or increase student learning? Also, the extent of planning is important—whether an individual has detailed plans for the long-term is critical in determining LoU. Persons in the lower Levels of Use will focus on the short-term, whereas those at the highest Levels of Use will be planning for both the short-term and the long-term.

LoU 0—Individuals at LoU 0 schedule no time and do not plan for the study or use of the innovation. A typical response from a person at LoU 0 may be, "As far as the innovation is concerned, I have no plans to do anything about it."

LoU I—At this Level of Use, individuals plan to gather information and resources necessary to make a decision for or against the use of an innovation. Individuals at this level may say something like, "Next month, I'm arranging to attend a workshop so that I can learn more about the innovation."

LoU II—Persons at LoU II identify steps and procedures entailed in obtaining resources and organizing activities and events for initial use of the innovation. They may respond with statements such as, "I'm not doing much now, but this summer I will pull out the textbook and organize student tasks."

LoU III—At LoU III, individuals plan for organizing and managing resources, activities, and events related primarily to immediate use of the innovation. Planned-for changes address managerial or logistical issues with a short-term perspective. Their plans focus on making innovation use smoother, more comfortable for the user. Often these plans are for the near future and don't reflect detailed

consideration of their long-term effects. A person at LoU III might say, "I'm planning every night for what I will do the next day. I haven't had time to plan for next month or for the whole semester."

LoU IVA—Individuals at LoU IVA plan intermediate and long-range actions with little projected variation in how the innovation will be used. Planning focuses on routine use of resources and personnel, but plans reflect knowledge of both short-term and long-term requirements of innovation use. Someone at this level might comment, "My plans in regard to the innovation are to follow the same content and procedures I used last year for this unit. They worked, so why change for change's sake?"

LoU IVB—At LoU IVB, individuals develop intermediate and long-range plans that anticipate possible and needed steps, resources, and events designed to enhance client outcomes. At this LoU, the individual has plans for changing use of the innovation to increase student learning or outcomes. Responses from an individual at this level will reflect the effect of outcomes on future planning. Someone at this level may say, "At the end of the semester, I will make decisions about revising the innovation based on the data related to using this innovation and my own observation of its effectiveness with the students."

LoU V—At this level, individuals plan specific actions to coordinate their own use of the innovation with other faculty members to improve student outcomes. Individuals at LoU V might say, "Plans for changing the innovation are in progress and involve four of us working together. We are going to add another strand so that students can have more time to learn the material."

LoU VI—Persons at LoU VI plan activities that involve pursuit of alternatives to enhance or replace the innovation. Comments from individuals at LoU VI might be along the lines of, "I'm planning to bring in someone who has implemented an innovation in the same area as the one we are using. I think it might be better for our students than what we are doing now."

Status Reporting

The Status Reporting Category describes how the individual perceives his or her use of the innovation at the present. It is a general statement that summarizes a person's LoU.

LoU 0—At LoU 0, an individual reports little or no personal involvement with an innovation. The person's response may be, "I'm not involved with the innovation in any way," or "I'm not interested in the innovation right now."

LoU I—An individual at LoU I reports presently orienting himself or herself to understanding what the innovation is and is not. He or she may be involved in general fact-finding and contemplation of the usefulness of the innovation in his or her situation. The person may be reading about the innovation or discussing it with others. He or she might report, "I'm learning about the innovation so I can decide whether or not I want to use it."

LoU II—Individuals at this level report preparing themselves for initial use of the innovation. Typical responses include, "I'm going to start using the innovation in September," or "I'm getting ready to use the innovation for the first time."

LoU III—Someone at LoU III reports that issues such as logistics, time management, and resource organization are the focus of most of his or her personal efforts to use the innovation. He or she might report, "I'm not using the innovation very well yet. The changes I make are to increase efficiency and order." Or he or she might say, "I'm trying to keep on top of all of the scheduling, organizing, and arranging that is necessary to keep the students going with this innovation."

LoU IVA—Individuals ranked at LoU IVA report that personal use of the innovation is going along satisfactorily with few, if any, problems. The person may say something like, "Believe me, I'm glad to find things going smoothly for everyone concerned. There may be some routine changes like those that occur every year, but in general it is working well."

LoU IVB—Those at LoU IVB report varying use of the innovation to change student outcomes. Typical responses from someone at LoU IVB might be, "Right now I'm changing the way I use the innovation based on student reactions and test results."

LoU V—Individuals at LoU V report spending time and energy collaborating with others about integrating their own use of the innovation. Responses from someone at LoU V may be, "Two of us are working together to coordinate use of the innovation. We think students are getting more out of it because of our collaboration."

LoU VI—Individuals at LoU VI consider major modifications or alternatives to the current use of the innovation. Those at this level might report, "I'm seriously considering combining another innovation with the one I am using now in order to give students more personal instruction and increase their learning."

Performing

This category recognizes actions the individual is actually taking in using or toward using the innovation. Indications for the Performing Category are the concrete examples of actions and behaviors and the reason for each.

LoU 0—The individuals at LoU 0 take no discernible action toward learning about or using the innovation. The innovation and/or materials and equipment needed to use the innovation are not present or in use. These individuals may acknowledge that they have heard of the innovation but report, "I'm not involved with this and have done nothing with it."

LoU I—Persons rated as LoU I explore the innovation and requirements of its use by talking to others about it, reviewing descriptive information and sample materials, attending orientation sessions, and/or observing others using the innovation. They typically will express their interest in using it, saying

something like, “I had a long talk with the consultant last week. He answered several of my questions and gave me a sample lesson to look over.”

LoU II—Persons at LoU II study reference materials in depth, organize resources and logistics, and schedule and receive training in preparation for initial use. They may report, “I have set up shelves with labels and computerized task sheets for each student.”

LoU III—Individuals who are at LoU III manage the innovation with varying degrees of inefficiency. Sometimes people at this level don’t anticipate immediate consequences, so the flow of actions may be uneven and uncertain. When they make changes in using the innovation, they make them primarily in response to logistical and organizational problems. Typical responses of LoU III persons may include admitting to spending most of their effort in organizing their work and materials and feeling as though they do not have enough time to think about long-range plans for implementation. They may respond with, “I brought in a grocery cart. It is just what I needed to move all the materials from room to room.”

LoU IVA—An individual at LoU IVA uses the innovation smoothly with minimal management problems; there is little variation in the established pattern of use. He or she may say, “I’m using the innovation very much like I did before. Materials and procedures are no problem since I worked them out the first time I used the innovation. It is sort of standardized.” The person at LoU IVA may also report that the innovation works well for his or her students.

LoU IVB—Someone at LoU IVB explores and experiments with alternative combinations of the innovation with existing practices to maximize student involvement and outcomes. He or she might report, “This year I’m trying out different ways of doing the interim assessments. I’m collecting formal data along with notes about my observation of student success or frustrations with the requirements of the innovation.”

LoU V—Individuals at LoU V collaborate with others in the use of the innovation as a means for expanding the innovation’s impact on students. Changes in use are made in coordination with other faculty members. Level V individuals may announce that a group of faculty members is working on increasing student success using the innovation. They may report something like, “We’re now organizing the time so that we see all students individually. This way we know it if one of them is falling behind.”

LoU VI—Individuals at LoU VI explore other innovations that could be used in combination with or in place of the present innovation in an attempt to develop a more effective way of improving student achievement. They may say, “I have contacted the Regional Lab about what they have. We need to find some ways to be sure that the content area reading builds vocabulary.”

Appendix D
SAS Program Used to Produce Reliability Analysis

This is the SAS program used to produce the reliability analysis described in Chapter 3, under the section "Establishing LoU Interviewer Reliability."

```
/* LoU Reliability
   This program computes the number and percent of
   LoU ratings which agree with other raters,
   and then goes on to compute ChRater2bach's alpha using the same data set.  */

OPTIONS LS=110 PS=56 PAGENO=1;

title1 'Level of Use Reliability: Percent Agreement with Other Raters';

DATA LoU LoU_N; infile 'C:\CBAM\LOU_Reliability\lou_rel9.txt' truncover firstobs=2;
    input tape_no $1-10 (Rater1 Rater2 Rater3 Rater4 Rater5 Rater6 Rater7 Rater8 Rater9)($5.);

data LoU; set LoU;
    Rater1_t = 0; Rater2_t = 0; Rater3_t = 0; Rater4_t = 0; Rater5_t = 0;
    Rater6_t = 0; Rater7_t = 0; Rater8_t = 0; Rater9_t = 0;

    IF Rater1 EQ Rater2 THEN do; Rater1_t = Rater1_t + 1; Rater2_t = Rater2_t + 1; end;
    IF Rater1 EQ Rater3 THEN do; Rater1_t = Rater1_t + 1; Rater3_t = Rater3_t + 1; end;
    IF Rater1 EQ Rater4 THEN do; Rater1_t = Rater1_t + 1; Rater4_t = Rater4_t + 1; end;
    IF Rater1 EQ Rater5 THEN do; Rater1_t = Rater1_t + 1; Rater5_t = Rater5_t + 1; end;
    IF Rater1 EQ Rater6 THEN do; Rater1_t = Rater1_t + 1; Rater6_t = Rater6_t + 1; end;
    IF Rater1 EQ Rater7 THEN do; Rater1_t = Rater1_t + 1; Rater7_t = Rater7_t + 1; end;
    IF Rater1 EQ Rater8 THEN do; Rater1_t = Rater1_t + 1; Rater8_t = Rater8_t + 1; end;
    IF Rater1 EQ Rater9 THEN do; Rater1_t = Rater1_t + 1; Rater9_t = Rater9_t + 1; end;

    IF Rater2 EQ Rater3 THEN do; Rater2_t = Rater2_t + 1; Rater3_t = Rater3_t + 1; end;
    IF Rater2 EQ Rater4 THEN do; Rater2_t = Rater2_t + 1; Rater4_t = Rater4_t + 1; end;
    IF Rater2 EQ Rater5 THEN do; Rater2_t = Rater2_t + 1; Rater5_t = Rater5_t + 1; end;
    IF Rater2 EQ Rater6 THEN do; Rater2_t = Rater2_t + 1; Rater6_t = Rater6_t + 1; end;
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IF Rater2 EQ Rater7 THEN do; Rater2_t = Rater2_t + 1; Rater7_t = Rater7_t + 1; end;
IF Rater2 EQ Rater8 THEN do; Rater2_t = Rater2_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater2 EQ Rater9 THEN do; Rater2_t = Rater2_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater3 EQ Rater4 THEN do; Rater3_t = Rater3_t + 1; Rater4_t = Rater4_t + 1; end;
IF Rater3 EQ Rater5 THEN do; Rater3_t = Rater3_t + 1; Rater5_t = Rater5_t + 1; end;
IF Rater3 EQ Rater6 THEN do; Rater3_t = Rater3_t + 1; Rater6_t = Rater6_t + 1; end;
IF Rater3 EQ Rater7 THEN do; Rater3_t = Rater3_t + 1; Rater7_t = Rater7_t + 1; end;
IF Rater3 EQ Rater8 THEN do; Rater3_t = Rater3_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater3 EQ Rater9 THEN do; Rater3_t = Rater3_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater4 EQ Rater5 THEN do; Rater4_t = Rater4_t + 1; Rater5_t = Rater5_t + 1; end;
IF Rater4 EQ Rater6 THEN do; Rater4_t = Rater4_t + 1; Rater6_t = Rater6_t + 1; end;
IF Rater4 EQ Rater7 THEN do; Rater4_t = Rater4_t + 1; Rater7_t = Rater7_t + 1; end;
IF Rater4 EQ Rater8 THEN do; Rater4_t = Rater4_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater4 EQ Rater9 THEN do; Rater4_t = Rater4_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater5 EQ Rater6 THEN do; Rater5_t = Rater5_t + 1; Rater6_t = Rater6_t + 1; end;
IF Rater5 EQ Rater7 THEN do; Rater5_t = Rater5_t + 1; Rater7_t = Rater7_t + 1; end;
IF Rater5 EQ Rater8 THEN do; Rater5_t = Rater5_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater5 EQ Rater9 THEN do; Rater5_t = Rater5_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater6 EQ Rater7 THEN do; Rater6_t = Rater6_t + 1; Rater7_t = Rater7_t + 1; end;
IF Rater6 EQ Rater8 THEN do; Rater6_t = Rater6_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater6 EQ Rater9 THEN do; Rater6_t = Rater6_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater7 EQ Rater8 THEN do; Rater7_t = Rater7_t + 1; Rater8_t = Rater8_t + 1; end;
IF Rater7 EQ Rater9 THEN do; Rater7_t = Rater7_t + 1; Rater9_t = Rater9_t + 1; end;

IF Rater8 EQ Rater9 THEN do; Rater8_t = Rater8_t + 1; Rater9_t = Rater9_t + 1; end;

Rater1_pct = 100 * Rater1_t / 8;
Rater2_pct = 100 * Rater2_t / 8;
Rater3_pct = 100 * Rater3_t / 8;
Rater4_pct = 100 * Rater4_t / 8;
Rater5_pct = 100 * Rater5_t / 8;
Rater6_pct = 100 * Rater6_t / 8;
Rater7_pct = 100 * Rater7_t / 8;
Rater8_pct = 100 * Rater8_t / 8;
```

```
    Rater9_pct = 100 * Rater9_t / 8;
    Overall = mean(of Rater1_pct Rater2_pct Rater3_pct Rater4_pct Rater5_pct
                  Rater6_pct Rater7_pct Rater8_pct Rater9_pct);

PROC PRINT UNIFORM DATA=LoU;
    var Tape_no Rater1 Rater2 Rater3 Rater4 Rater5 Rater6 Rater7 Rater8 Rater9;
          run;

PROC MEANS NOPRINT ;
    VAR    Rater1_pct Rater2_pct Rater3_pct Rater4_pct Rater5_pct
          Rater6_pct Rater7_pct Rater8_pct Rater9_pct Overall;
           OUTPUT OUT=Overall
    mean = Rater1_pct Rater2_pct Rater3_pct Rater4_pct Rater5_pct
          Rater6_pct Rater7_pct Rater8_pct Rater9_pct Overall;

DATA LoU; SET LoU Overall;
    if tape_no eq ' ' then tape_no = 'Overall';

PROC PRINT data=LoU UNIFORM DOUBLE;
    VAR tape_no Rater1_pct Rater2_pct Rater3_pct Rater4_pct Rater5_pct
              Rater6_pct Rater7_pct Rater8_pct Rater9_pct Overall;
    Format      Rater1_pct Rater2_pct Rater3_pct Rater4_pct Rater5_pct
              Rater6_pct Rater7_pct Rater8_pct Rater9_pct Overall 8.0;

data LoU_N; set LoU_N;
IF (Rater1 EQ "0 ") then Rater1_N = 0;
IF (Rater1 EQ "1 ") then Rater1_N = 1;
IF (Rater1 EQ "2 ") then Rater1_N = 2;
IF (Rater1 EQ "3 ") then Rater1_N = 3;
IF (Rater1 EQ "4A") then Rater1_N = 4;
IF (Rater1 EQ "4B") then Rater1_N = 4.5;
IF (Rater1 EQ "5 ") then Rater1_N = 5;
IF (Rater1 EQ "6 ") then Rater1_N = 6;

IF (Rater2 EQ "0 ") then Rater2_N = 0;
IF (Rater2 EQ "1 ") then Rater2_N = 1;
IF (Rater2 EQ "2 ") then Rater2_N = 2;
IF (Rater2 EQ "3 ") then Rater2_N = 3;
IF (Rater2 EQ "4A") then Rater2_N = 4;
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IF (Rater2 EQ “4B”) then Rater2_N = 4.5;
IF (Rater2 EQ “5 ”) then Rater2_N = 5;
IF (Rater2 EQ “6 ”) then Rater2_N = 6;

IF (Rater3 EQ “0 ”) then Rater3_N = 0;
IF (Rater3 EQ “1 ”) then Rater3_N = 1;
IF (Rater3 EQ “2 ”) then Rater3_N = 2;
IF (Rater3 EQ “3 ”) then Rater3_N = 3;
IF (Rater3 EQ “4A”) then Rater3_N = 4;
IF (Rater3 EQ “4B”) then Rater3_N = 4.5;
IF (Rater3 EQ “5 ”) then Rater3_N = 5;
IF (Rater3 EQ “6 ”) then Rater3_N = 6;

IF (Rater4 EQ “0 ”) then Rater4_N = 0;
IF (Rater4 EQ “1 ”) then Rater4_N = 1;
IF (Rater4 EQ “2 ”) then Rater4_N = 2;
IF (Rater4 EQ “3 ”) then Rater4_N = 3;
IF (Rater4 EQ “4A”) then Rater4_N = 4;
IF (Rater4 EQ “4B”) then Rater4_N = 4.5;
IF (Rater4 EQ “5 ”) then Rater4_N = 5;
IF (Rater4 EQ “6 “) then Rater4_N = 6;

IF (Rater5 EQ “0 ”) then Rater5_N = 0;
IF (Rater5 EQ “1 ”) then Rater5_N = 1;
IF (Rater5 EQ “2 ”) then Rater5_N = 2;
IF (Rater5 EQ “3 ”) then Rater5_N = 3;
IF (Rater5 EQ “4A”) then Rater5_N = 4;
IF (Rater5 EQ “4B”) then Rater5_N = 4.5;
IF (Rater5 EQ “5 ”) then Rater5_N = 5;
IF (Rater5 EQ “6 ”) then Rater5_N = 6;

IF (Rater6 EQ “0 ”) then Rater6_N = 0;
IF (Rater6 EQ “1 ”) then Rater6_N = 1;
IF (Rater6 EQ “2 ”) then Rater6_N = 2;
IF (Rater6 EQ “3 ”) then Rater6_N = 3;
IF (Rater6 EQ “4A”) then Rater6_N = 4;
IF (Rater6 EQ “4B”) then Rater6_N = 4.5;
IF (Rater6 EQ “5 ”) then Rater6_N = 5;
IF (Rater6 EQ “6 ”) then Rater6_N = 6;
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IF (Rater7 EQ “0 ”) then Rater7_N = 0;
IF (Rater7 EQ “1 ”) then Rater7_N = 1;
IF (Rater7 EQ “2 ”) then Rater7_N = 2;
IF (Rater7 EQ “3 ”) then Rater7_N = 3;
IF (Rater7 EQ “4A”) then Rater7_N = 4;
IF (Rater7 EQ “4B”) then Rater7_N = 4.5;
IF (Rater7 EQ “5 ”) then Rater7_N = 5;
IF (Rater7 EQ “6 ”) then Rater7_N = 6;

IF (Rater8 EQ “0 ”) then Rater8_N = 0;
IF (Rater8 EQ “1 ”) then Rater8_N = 1;
IF (Rater8 EQ “2 ”) then Rater8_N = 2;
IF (Rater8 EQ “3 ”) then Rater8_N = 3;
IF (Rater8 EQ “4A”) then Rater8_N = 4;
IF (Rater8 EQ “4B”) then Rater8_N = 4.5;
IF (Rater8 EQ “5 ”) then Rater8_N = 5;
IF (Rater8 EQ “6 ”) then Rater8_N = 6;

IF (Rater9 EQ “0 ”) then Rater9_N = 0;
IF (Rater9 EQ “1 ”) then Rater9_N = 1;
IF (Rater9 EQ “2 ”) then Rater9_N = 2;
IF (Rater9 EQ “3 ”) then Rater9_N = 3;
IF (Rater9 EQ “4A”) then Rater9_N = 4;
IF (Rater9 EQ “4B”) then Rater9_N = 4.5;
IF (Rater9 EQ “5 ”) then Rater9_N = 5;
IF (Rater9 EQ “6 ”) then Rater9_N = 6;

proc corr data=LoU_N alpha;
    var Rater1_N Rater2_N Rater3_N Rater4_N Rater5_N Rater6_N Rater7_N Rater8_N Rater9_N;
run;
```

Appendix E
Levels of Use (LoU) of the Innovation

SCALE POINT Definitions of the Levels of Use of the Innovation	CATEGORIES		
Levels of Use are distinct states that represent observably different types of behavior and patterns of innovation use as exhibited by individuals and groups. These levels characterize a user's development in acquiring new skills and varying use of the innovation. Each level encompasses a range of behaviors but is limited by a set of identifiable Decision Points. For descriptive purposes, each level is defined by seven categories.	**KNOWLEDGE**	**ACQUIRING INFORMATION**	**SHARING**
	That which the user knows about characteristics of the innovation, how to use it, and consequences of its use. This is cognitive knowledge related to using the innovation, not feelings or attitudes.	Solicits information about the innovation in a variety of ways, including questioning resource persons, corresponding with resource agencies, reviewing printed materials, and making visits.	Discusses the innovation with others. Shares plans, ideas, resources, outcomes, and problems related to use of the innovation.
LEVEL 0 NONUSE: State in which the user has little or no knowledge of the innovation, has no involvement with the innovation, and is doing nothing toward becoming involved.	Knows nothing about this or similar innovations or has only very limited general knowledge of efforts to develop innovations in the area.	Takes little or no action to solicit information beyond reviewing descriptive information about this or similar innovations when it happens to come to personal attention.	Is not communicating with others about the innovation beyond possibly acknowledging that the innovation exists.
DECISION POINT A	Takes action to learn more detailed information about the innovation.		
LEVEL I ORIENTATION: State in which the user has acquired or is acquiring information about the innovation and/or has explored or is exploring its value orientation and its demands upon the user and the user system.	Knows general information about the innovation such as origin, characteristics, and implementation requirements.	Seeks descriptive material about the innovation. Seeks opinions and knowledge of others through discussions, visits, or workshops.	Discusses the innovation in general terms and/or exchanges descriptive information, materials, or ideas about the innovation and possible implications of its use.
DECISION POINT B	Makes a decision to use the innovation by establishing a time to begin.		
LEVEL II PREPARATION: State in which the user is preparing for first use of the innovation	Knows logistical requirements, necessary resources and timing for initial use of the innovation, and details of initial experiences for clients.	Seeks information and resources specifically related to preparation for use of the innovation in own setting.	Discusses resources needed for initial use of the innovation. Joins others in pre-use training, and in planning for resources, logistics, schedules, etc., in preparation for first use.
DECISION POINT C	Changes, if any, and use are dominated by user needs. Clients may be valued; however, management, time, or limited experimental knowledge dictate what the user does.		
LEVEL III MECHANICAL USE: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.	Knows on a day-to-day basis the requirements for using the innovation. Is more knowledgeable on short-term activities and effects than long-range activities and effects of use of the innovation.	Solicits management information about such things as logistics, scheduling techniques, and ideas for reducing amount of time and work required of user.	Discusses management and logistical issues related to use of the innovation. Resources and materials are shared for purposes of reducing management, flow, and logistical problems related to use of the innovation.
DECISION POINT D-1	A routine pattern of use is established. Changes for clients may be made routinely, but there are no recent changes outside the pattern.		
LEVEL IVA ROUTINE: Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.	Knows both short- and long-term requirements for use and how to use the innovation with minimum effort or stress.	Makes no special effort to seek information as a part of ongoing use of the innovation.	Describes current use of the innovation with little or no reference to ways of changing use.
DECISION POINT D-2	Changes use of the innovation based on formal or informal evaluation in order to increase client outcomes. The changes must be recent.		
LEVEL IVB REFINEMENT: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.	Knows cognitive and affective effects of the innovation on clients and ways for increasing impact on clients.	Solicits information and materials that focus specifically on changing use of the innovation to affect client outcomes.	Discusses own methods of modifying use of the innovation to change client outcomes.
DECISION POINT E	Initiates changes in use of innovation based on input of and in coordination with what colleagues are doing.		
LEVEL V INTEGRATION: State in which the user is combining own efforts to use the innovation with the related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.	Knows how to coordinate own use of the innovation with colleagues to provide a collective impact on clients.	Solicits information and opinions for the purpose of collaborating with others in use of the innovation.	Discusses efforts to increase client impact through collaboration with others on personal use of the innovation.
DECISION POINT F	Begins exploring alternatives or major modifications to the innovation presently in use.		
LEVEL VI RENEWAL: State in which the user reevaluates the quality of use of the innovation, seeks major modifications or alternatives to the present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.	Knows of alternatives that could be used to change or replace the present innovation that would improve the quality of outcomes of its use.	Seeks information and materials about other innovations as alternatives to the present innovation or for making major adaptations in the innovation.	Focuses discussions on identification of major alternatives to or replacements for the current innovation.

CATEGORIES			
ASSESSING	**PLANNING**	**STATUS REPORTING**	**PERFORMING**
Examines the potential or actual use of the innovation or some aspect of it. This can be a mental assessment or can involve actual collection and analysis of data.	Designs and outlines short- and/or long-range steps to be taken during process of innovation adoption, i.e., aligns resources, schedules, and activities, and meets with others to organize and/or coordinate use of the innovation.	Describes personal stand at the present time in relation to use of the innovation.	Carries out the actions and activities entailed in operationalizing the innovation.
Takes no action to analyze the innovation, its characteristics, possible use, or consequences of use.	Schedules no time and specifies no steps for the study or use of the innovation.	Reports little or no personal involvement with the innovation.	Takes no discernible action toward learning about or using the innovation. The innovation and/or its accoutrements are not present or in use.
Analyzes and compares materials, content, requirements for use, evaluation reports, potential outcomes, strengths, and weaknesses for purpose of making a decision about use of the innovation.	Plans to gather necessary information and resources as needed to make a decision for or against use of the innovation.	Reports presently orienting self to what the innovation is and is not.	Explores the innovation and requirements for its use by talking to others about it, reviewing descriptive information and sample materials, attending orientation sessions, and observing others using it.
Analyzes detailed requirements and available resources for initial use of the innovation.	Identifies steps and procedures entailed in obtaining resources and organizing activities and events for initial use of the innovation.	Reports preparing self for initial use of the innovation.	Studies reference materials in depth, organizes resources and logistics, and schedules and receives skill training in preparation for initial use.
Examines own use of the innovation with respect to problems of logistics, management, time, schedules, resources, and general reactions of clients.	Plans for organizing and managing resources, activities, and events related primarily to immediate ongoing use of the innovation. Planned-for changes address managerial or logistical issues with a short-term perspective.	Reports that logistics, time, management, resource organization, etc., are the focus of most personal efforts to use the innovation.	Manages the innovation with varying degrees of efficiency. Often lacks anticipation of immediate consequences. The flow of actions in the user and clients is often disjointed, uneven, and uncertain. When changes are made, they are primarily in response to logistical and organizational problems.
Limits evaluation activities to those administratively required, with little attention paid to findings for the purpose of changing use.	Plans intermediate and long-range actions with little projected variation in how the innovation will be used. Planning focuses on routine use of resources, personnel, etc.	Reports that personal use of the innovation is going along satisfactorily with few if any problems.	Uses the innovation smoothly with minimal management problems; over time there is little variation in pattern of use.
Assesses use of the innovation for the purpose of changing current practices to improve client outcomes.	Develops intermediate and long-range plans that anticipate possible and needed steps, resources, and events designed to enhance client outcomes.	Reports varying use of the innovation in order to change client outcomes.	Explores and experiments with alternative combinations of the innovation with existing practices to maximize client involvement and to optimize client outcomes.
Appraises collaborative use of the innovation in terms of client outcomes and strengths and weaknesses of the integrated effort.	Plans specific actions to coordinate own use of the innovation with others to achieve increased impact on clients.	Reports spending time and energy collaborating with others about integrating own use of the innovation.	Collaborates with others in use of the innovation as a means for expanding the innovation's impact on clients. Changes in use are made in coordination with others.
Analyzes advantages and disadvantages of major modifications or alternatives to the present innovation.	Plans activities that involve pursuit of alternatives to enhance or replace the innovation.	Reports considering major modifications or alternatives to present use of the innovation.	Explores other innovations that could be used in combination with or in place of the present innovation in an attempt to develop more effective means of achieving client outcomes.

Concerns-Based Adoption Model Resources and Professional Development

http://www.sedl.org/cbam/

This publication is one in a series of three technical manuals about the Concerns-Based Adoption Model (CBAM).

Evaluators, researchers, and change leaders may take advantage of both our publications and professional development to learn to apply the model appropriately in facilitating and measuring change.

CBAM Professional Development

CBAM training and professional development sessions will enrich your reading and learning experiences. SEDL's CBAM professional development sessions deepen participants' understanding of the model so they may apply the three dimensions of CBAM in their own schools and districts to facilitate and measure change. For administrators and educators who are acting as change leaders, SEDL also offers CBAM training-of-trainer sessions. Sessions are offered at SEDL's headquarters in Austin or you may arrange for professional development sessions onsite. The authors of this manual also welcome inquiries and offer professional development, separate from that offered by SEDL.

Additional Reading About the Concerns-Based Adoption Model

The SEDL publications department offers numerous resources related to the CBAM. Some of these have been published by other organizations but are distributed by SEDL. For more information on these publications, visit our online catalog at www.sedl.org/pubs/.

GEORGE, A. A., HALL, G. E., & STIEGELBAUER, S. M. (2006)

Measuring Implementation in Schools: The Stages of Concern Questionnaire

Austin, TX: SEDL

This publication explains the development of the Stages of Concern (SoC) dimension and how to measure the stages. It also discusses recent studies related to the SoC and includes a CD with tools for scoring the SoC Questionnaire.

HALL, G. E., DIRKSEN, D. J., & GEORGE, A. A. (2006)

Measuring Implementation in Schools: Levels of Use

Austin, TX: SEDL

This updated manual for the Levels of Use (LoU) describes the development of the LoU concept, which allows evaluators, researchers, and change facilitators to determine the extent of use of an innovation. The manual includes a pullout chart for identifying the Levels of Use.

HALL, G. E., & HORD, S. M. (2011)

Implementing Change: Patterns, Principles, and Potholes, 4th Edition

Boston: Allyn & Bacon

Implementing Change focuses on how the Concerns-Based Adoption Model gives school leaders a perspective for understanding, evaluating, and facilitating the change process. This second edition also describes three other change approaches: Diffusion, Systems, and Organizational Development. Also, a chapter is devoted to the development of Professional Learning Communities.

HALL, G. E., NEWLOVE, B. W., GEORGE, A. A., RUTHERFORD, W. L., & HORD, S.M. (1991)

Measuring Change Facilitator Stages of Concern: A Manual for Use of the CFSoC Questionnaire

Greeley, CO: Center for Research on Teaching and Learning.

Those who facilitate the change process have concerns about their role that are similar in dynamics to the front-line teachers implementing change. *Measuring Change Facilitator Stages of Concern* provides a Stages of Concern Questionnaire designed especially for principals, staff developers, or teacher leaders who are serving as change facilitators, but the frame of reference is the role of change facilitation rather than "my" use of the innovation.

HORD, S. M., RUTHERFORD, W. L., HULING, L., & HALL, G. E. (2006)

Taking Charge of Change, Revised Edition

Austin, TX: SEDL

Taking Charge of Change was written for working administrators and change leaders. It is one of the most readable introductions to the Concerns-Based Adoption Model that has been published. The lucid description of the CBAM gives educators concepts, tools, and techniques they can use to facilitate school change and improvement programs.

HORD, S. M., STIEGELBAUER, S. M., HALL, G. E., & GEORGE, A. A. (2006)

Measuring Implementation in Schools: Innovation Configurations

Austin, TX: SEDL

This publication describes the development of the Innovation Configurations (IC) dimension and how to determine the different ways an innovation may be implemented. The manual includes detailed descriptions of how to construct Innovation Configurations Maps for a single innovation or multiple innovations and provides numerous examples of IC Maps.

KILLION, J., HORD, S. M., ROY, P., KENNEDY, J., & HIRSH, S. (2012)

Standards into Practice: School-Based Roles: Innovation Configuration Maps for Standards for Professional Learning

Oxford, OH: Learning Forward

Standards into Practice: School-Based Roles: Innovation Configuration Maps for Standards for Professional Learning provides clear pictures of Learning Forward's Standards for Professional

Learning in practice and guides educators in increasing the quality and results of professional learning. This book presents innovation configuration maps for teachers, coaches/teacher leaders, principals, and school leadership teams.

Supplemental CBAM Resource

A supplemental resource in video format is available on the SEDL website at www.sedl.org/cbam/videos/cgi? The video includes an overview of the CBAM constructs as they may be applied to assessment of implementation of standards-based reform and accountability initiatives. The video features interviews with Dr. Gene Hall, Dr. Shirley Hord, and Dr. Archie George, three of the original CBAM developers and principal authors of this revised series.

Contact Us

We invite you to share your comments and questions about the CBAM, purchase the CBAM resources and other school improvement products, or talk with a SEDL staff member to arrange CBAM professional development sessions.

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Send an e-mail:	services@sedl.org

Authors' Biographies

GENE E. HALL, PhD

Gene Hall earned his MA and PhD degrees in science education from Syracuse University. For the first 18 years (1968–1986) of his academic career, he was a faculty member and researcher at the University of Texas at Austin in the national Research and Development Center for Teacher Education. During that time he and his colleagues developed and conducted the initial verification studies for the Concerns-Based Adoption Model (CBAM). He then moved to the University of Florida as a professor of educational leadership. In 1988 he accepted the position of dean of the College of Education at the University of Northern Colorado where he also served as a professor of educational leadership. In 1999, he became the dean of the College of Education at the University of Nevada, Las Vegas. Following his 5 years as dean, he again assumed a faculty position as a professor of educational leadership. Throughout Dr. Hall's career, the primary focus of his research has been based in application of, consulting about, and evaluation of change processes from a concerns-based perspective. Dr. Hall also has had a parallel academic career regarding innovation in and national accreditation of teacher education.

Recent publications include the following:

Hall, G. E., & Hord, S. M. (2006). *Implementing change: Patterns, principles and potholes* (2nd ed.). Boston: Allyn and Bacon.

Hall, G. E., Gollnick, D., & Quinn, L. (in press). *The joy of teaching.* Boston: Allyn and Bacon.

Johnson, J., Musial, D., Hall, G. E., Gollnick, D., & Dupuis, V. (2005). *Introduction to the foundations of American education* (13th ed.). Boston, MA: Allyn and Bacon.

DEBRA J. DIRKSEN, PhD

Debra Dirksen earned her MEd in secondary education with an emphasis in instructional design from Utah State University and her PhD in educational technology from the University of Northern Colorado. She has served as the state educational technology Specialist for the Idaho Department of Education and a faculty member at Metropolitan State College of Denver. She currently serves as the Faculty Teaching and Learning Center director for Aims Community College in Greeley, Colorado. Dr. Dirksen began working with Dr. Gene Hall while at the University of Northern Colorado and has worked with the Concerns-Based Adoption Model (CBAM) to support professional development and to evaluate the implementation of various innovations for more than 10 years. Most recently she has worked with the Colorado Department of Education to implement Levels of Use as a tool to evaluate the implementation of grant-funded initiatives.

Recent publications include the following:

Dirksen, D. J. (2000). *Implementation of various reading interventions by teachers who participated in district sponsored training.* Denver, CO: Cherry Creek School District.

Dirksen, D. J. (2002). *An evaluation of the laptop initiative for Albertson College.* Caldwell, ID: Albertson College.

Wizniewski, L., Glass, J., Alper. S., & Dirksen, D. (2005). *The Colorado experience in using the Concerns-Based Adoption Model to define and measure teacher quality among special educators: Access to the general education setting for students with disabilities.* Manuscript submitted for publication.

ARCHIE A. GEORGE, PhD

Archie George earned his PhD in measurement and evaluation from the University of Texas at Austin. During his 7 years at UT–Austin (1973–1980), he was a researcher at the Research and Development Center for Teacher Education. It was during this time that he and his colleagues developed and conducted the initial verification studies with the Concerns-Based Adoption Model (CBAM). He then moved to the University of Idaho as an analyst in the management information systems department. In 1989 he was promoted to assistant director, and in 1998 accepted the position of director of institutional research and assessment at the same university.

Throughout Dr. George's career, the primary focus of his collaborative research has been based in application of, consulting about, and evaluation of the change process from a concerns-based perspective.

Recent publications include the following:

Alquist, A., Hendrickson, M., Johnson, M., Thornton, E. A., Uchiyama, K., West, C. E., Hall, G. E., & George, A. A. (1999). Mapping the configuration of mathematics teaching. *Journal of Classroom Interaction, 34*(1), 18–26.

George, A. A., Hall, G. E., & Uchiyama, K. (2000). Extent of implementation of a standards-based approach to teaching mathematics and student outcomes. *Journal of Classroom Interaction, 35*(1), 8–25.

Hall, G. E., and George, A. A. (1999). The impact of principal change facilitator style on school and classroom culture. In H. J. Freiberg (Ed.), *School climate: Measuring, improving and sustaining healthy learning environments.* Philadelphia: Falmer Press.