

**LEADERSHIP PRODUCTS AS INNOVATIONS IN THE CONTEXT OF  
ROGERS' DIFFUSION THEORY**

by

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## (ABSTRACT)

In this study, two implementable leadership products were analogous to innovations, when framed in the context of Rogers' diffusion-of-innovation theory. Thus, the products' respective dissemination patterns were compared and contrasted--quantitatively through purchase numbers, and qualitatively through opinions and events recollected by early users. The case-study approach was central to the investigation, and the results supported the Rogers model with regard to most constructs. The results pertaining to the *S*-shaped (sigmoidal) prototypical distribution curve, however, were enigmatic. The inverse conformity of sales figures with the *S*-shaped distribution curve implied that the dissemination process began during the field-testing stage rather than the purchasing stage. The organizational structure of the user institutions (*targeted social system* construct) conformed to Rogers' theory that autonomy and teamwork characterized management climates where innovation tended to flourish. Field-testers and other early users were *opinion leaders* as construed by Rogers. The fact that twice as many field tests were conducted for the *Case Studies* as for the *Simulation* was likely a factor in the disparate 6:1 ratio of units of *Cases* sold to units of the *Simulation* sold for three consecutive years.

Other factors possibly accounting for the disparate sales came from the attributes-of-innovation template which framed five generic attributes--compatibility, relative advantage, complexity, trialability, and observability. Both products conformed to the attributes as conceptualized by Rogers. The main difference that influenced the disparate sales was the greater *complexity* of the *Simulation* than of the *Cases*, although cost may have been a *compatibility/relative advantage* contributory factor. Finally, the study's results indicated that dissemination parameters may have been narrowed by (a) the

absence of *mass media communication channels* as part of the dissemination strategy at the awareness stage, and (b) lack of market research to focus the naming and packaging of the products for optimum *compatibility* and *relative advantage*. Researchers and change agencies can use these findings to improve future dissemination strategies and product designs.

## DEDICATION

To Robert Edwin Lewis, my husband, my best friend,  
in celebration of the happiest years of my adult life!

June 24, 1995, when I first became your wife,  
a new world for me began.

How can words ever suffice as thanks,  
for the excitement you added to my life;  
for your unflagging support of my mission--  
for your unerring faith in my acumen and ambition?

In this, our third year as man and wife

I dedicate to you, my Darling, this labor-of-love--  
Completed at last by the grace of God,  
Who sent to me an extraordinary man!

Thanks to you and your patience without end,  
My dissertation, I did successfully defend!

You intuitively recognized when I was "on a roll"  
and you cooked the meals and ironed the clothes;

And you understood when you kissed me goodnight,  
as I sat crafting lines at my desk,  
that the muses, full of zest, however ill-timed,  
kept me working overtime--I could not take a rest!

Thank you, Sweetheart,  
for your steadfast stance whenever I would pout,

As emotional arrows pelted me from without,

threatening my confidence--increasing my doubt.  
Because of you I persevered, pursuing my goal--a doctoral degree.  
And now I stand, exhausted but free, at the end of the journey.  
The mission--accomplished--my hopes are now high,  
That I'll repay you by and by,  
By carving my niche in the world of words and work,  
And using my talents in writing and research--  
To add a measure of insight,  
    to alleviate somewhat the plight  
    of dysfunctionality.  
That plagues the family  
    and pelts the school  
    and workplace, too,  
Forcing us all to think anew  
    of how to tackle the challenges  
    and manage the changes--  
Intact families to renew--  
And seeds of integrity to sew  
    that humanity may grow  
    in civility and spirit too,  
Yielding dreams abundant in colorful hues;  
Their blossoms refreshed by morning dews.  
Thank you, my husband, for a dream come true,  
Remember, my Darling, how much I love you!

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## Chapter 1

### THE PROBLEM

#### Introduction

The literature about educational change exposed a wide gap between knowledge acquired through research and the implementation of that knowledge. By reflecting on the nature and consequence of that gap, I discerned a problem area that impelled the present study. First, if educational researchers and change agencies could better understand how a product's design or attributes interact with other factors in the diffusion process, they could harness this information to improve future product designs and dissemination strategies. Second, if organizational structures which tend to inhibit positive changes are identified and better understood, perhaps change agencies could develop strategies to neutralize the inhibitive impact among client agencies so-structured. Hence, the researchers and change agencies could narrow the gap between *accrued* and *applied* research findings and thereby accelerate the implementation of positive changes in education.

#### *Commentary and Criticism*

The perception of public education as a systemically stiff and pedagogically lethargic enterprise was widely magnified in the 1980s by a cacophony of renown institutional voices. Their criticisms echoed across the nation and activated chords of frustration and futility among parents and students alike. First, the National Commission

on Excellence in Education (1983) published a searing assessment of American education in *A Nation At Risk*. Second, the William T. Grant Foundation's Commission on Work, Family and Citizenship (1988), issued a poignant critique and call for action in *The Forgotten Half*. Hence, a new era dawned on the educational landscape--an era of intense scrutiny by parents, employers, and others, along with their demands for change. Public schooling was pressured to transform, broaden, and intensify the nature and scope of its mandate and mission. Americans believed that education should equip *all* citizens to cope with the tough, new challenges expected to confront them in their homes, schools, and workplaces in the 21st century.

#### *Contemporary Context*

Increasingly, such demands for higher quality outcomes, in the context of today's consumer-driven economy, voter-driven political arena, and tax-payer-driven governance, include optimizing the benefits of educational innovation and reform. As the 21st century approaches, and a 5 or 6 trillion-dollar national debt hovers ominously on the economic horizon, public education is being scrutinized by tenacious and discriminating citizen-advocates, wielding sharp, state-of-the-art political scalpels. With surgical precision they are attempting to remove debilitating impediments to learning.

## Background of the Problem

### *Diffusion Research in Education*

#### *Historical Roots of Educational Change*

The American-born phenomenon of public education for the masses has undergone changes almost since its inception. As early as 1941, critical assessments of such changes began to be documented (Mort, 1953; Mort & Cornell, 1941). Again in 1964, Mort chronicled educational innovations from the 1930s, concluding that a 50-year time lag was typical from perception of need for change to the introduction and diffusion of an innovation to meet that need. Research in educational change has increased exponentially since then (Anderson, 1966; Carlson, 1965; Finch & McGough, 1983; Hall, George, & Rutherford, 1986; Hall & Hord, 1987; Halpern & Associates, 1994; Havelock, 1972, 1973; Hultman, 1979; Miles, 1964; Owens & Steinhoff, 1976; Rich, 1978; Roberts, 1975). In 1961 education publications numbered only 23 or 5% of all diffusion studies; by 1994, education diffusion studies numbered 359 or 9% of the total diffusion research (Rogers, 1995). Echoing Dr. Paul Mort (1964), Rogers (1995) found that "a considerable time lag was required for the widespread adoption of new educational ideas" (p.64) and that 25 years was the typical time interval.

#### *Development of Education Research Centers*

In the years that followed Rogers' first publication of diffusion research (1962), numerous education research centers and institutes were created or recreated and armed with the legislative mandates to build a strong and vibrant empirical base from which to launch solid, effective, comprehensive, systemic, and transformative educational reforms.

A flood of research ensued (see citations above), enriching enormously the empirical base that today undergirds the array of products developed and disseminated to address critical educational issues. The overarching concern was how best to educate all citizens for productive employment, successful self- and family-management, and responsible civic-engagement (Bennett, 1974; Finch, Gregson, & Faulkner, 1991; Hull & Parnell, 1991; McCaslin & Walton, 1973; Mort, 1964; Oscarson, 1976; Page, 1976; Rogers, 1983, 1995; Rogers & Shoemaker, 1971; Schaller, 1972; Schmidt, Finch, & Faulkner, 1992).

#### *Additional Research Needed*

##### *Changes-Agency Perspective*

Empirically measuring the success of research centers' strategies for disseminating research knowledge in order to effect positive changes in public schooling became a compelling undertaking--albeit one that was too complex and too broad to be investigated in the restricted parameters of one study. New knowledge could, however, accrue from a number of smaller studies. Moreover, in his 1995 edition of *Diffusion of Innovations*, Rogers pointed out that although the number of publications in diffusion of educational innovations had increased enormously, "An exciting potential contribution could be made by the education research tradition, stemming from the fact that organizations are involved, in one way or another, in the adoption of educational innovations"(p.63). Indeed, decisions regarding diffusion and adoption in education often emanated from organizations whose leaders were "involved in collective and/or authority innovation-decisions" (p.63).



### *User-Organization Perspective*

The National Center for Research in Vocational Education, University of California, Berkeley (NCRVE/UCB) is a change agency whose clients are involved in implementing educational change. Such clients may expect their personnel to confer with colleagues and/or secure approval from several higher layers of management prior to purchasing or implementing an innovation. Accordingly, an examination of organizational structures of the Center's clients can contribute to the knowledge currently lacking in diffusion research. Specifically, how does the Rogers framework apply organizationally to the dissemination of innovations if persons implementing the innovations defer to layers of collective or hierarchical approvals prior to making decisions?

### *Product-Design Perspective*

The Rogers template can also help explicate a second question. Namely, how do different characteristics of the products themselves interact with other factors to affect the diffusion process? Aspects of the Rogers template and other frameworks have been tested previously for applicability to a number of vocational-technical innovations in sundry attempts to assess impact or adoption of products and programs. The salient studies undergirding my research are summarized below and discussed more fully in Chapter 2, Review of the Literature.

### *Models Previously Used in Vocational-Technical Research*

#### *The Agricultural Model*

Rogers (1995) noted that many rural research studies were generated by the agriculture extension service. A review of the education literature revealed one extension service researcher who designed a template that was used in subsequent education diffusion studies. Conceptualized by C. F. Bennett, the template was described in his 1974 publication entitled, *How to Analyze Impacts of Extension Programs*. The model was subsequently adopted in many agricultural and occupational investigations and was especially popular for impact studies related to vocational-technical education which, in rural communities, was nurtured in the cradle of agricultural extension's contextual learning and experimentation paradigm (Bennett, 1974; Daughtry, Schroder, Finch, & Frantz, 1995).

#### *Behavioral Psychology and Concerns-Based Models*

During the 1970s, several researchers undertook to examine aspects of diffusion of innovation in vocational-technical education, based on frameworks other than the agricultural one—frameworks primarily grounded in models which measured impact on some continuum of change in cognitive-behavioral-affective interactions (McCaslin & Walton, 1973; Oscarson, 1976; Page, 1973). More recently, two researchers (Aneke, 1996; Long, 1994) investigated the school reforms designed to help create exemplary workers--workers prepared to compete in a rapidly changing, highly technological, and globally competitive 21st century marketplace. Long (1994) investigated the diffusion of tech-prep as an innovation in selected Virginia school systems. Aneke (1996) used a school-wide reform initiative to investigate teacher concerns at 19 schools which were implementing the High-Schools-That-Work reform program in Virginia. Both

researchers used instruments adapted from modified segments of the Concerns-Based Adoption Model (CBAM), first developed by the University of Texas Research and Development Center to facilitate change in education (Aneke, 1996; Long, 1994).

## Rationale for This Investigation

### *Need for Measuring Dissemination*

Despite voluminous research efforts in the field of change in education generally and more specifically change in vocational-technical education, efforts to measure the extent of dissemination of the multiplicity of practices and products designed to effect positive changes have been less prolific. Even in specific studies designed to measure the impact of change, the focus has been predominantly on the aspects of the adopter of the innovation. Few have focused on (a) the dissemination process of education innovations or interventions, (b) the target-organization's structure as a factor in the dissemination process, or (c) the attributes of the innovation itself as factors inhibiting or enhancing its diffusion among targeted users (Rogers, 1995). Noting the enormous variation in the extent of adoption of sundry educational innovations, Rogers lamented the lack of research on the interrelationship between the rate-of-adoption and the attributes of educational innovations. He collected and synthesized evidence from hundreds of non-education studies, demonstrating that an innovation's perceived attributes impacted heavily the extent of its diffusion (Rogers, 1995).

### *Attributes-of-Innovation as a Construct*

The attributes, generically identified as relative advantage, compatibility, complexity, observability, and trialability were found to be measurable across a variety of disciplines and types of innovations being diffused (Rogers, 1995). As previously stated, if educational researchers and change agencies could better understand the attributes associated with the products they are disseminating and how those attributes relate to the extent of diffusion, they could incorporate this information in future product development and dissemination strategies in order to maximize the impact of positive changes in education. Additionally, if organizational structures which tend to inhibit diffusion are understood, perhaps change agencies or client organizations so-structured could take positive transformative measures to minimize the inhibitive impact of bureaucratic thickets or turf-protecting autocrats.

## The Conceptual Framework for the Study

### *Strengths of the Rogers Framework*

After carefully examining the previously mentioned frameworks--one agricultural model, several cognitive-affective-behavioral models, and modifications of the concerns-based models--I chose the Rogers framework for this study. The other frameworks had two basic limitations: first, they assumed linearity of behavior change; second, they failed to consider attributes of innovations as factors affecting the extent that the innovations are used. The more comprehensive Rogers framework, on the other hand, allowed for (a) a non-linear user change-process and (b) the examination of the attributes of innovations as factors impacting the extent of an innovation's dissemination and use.

Furthermore, the Rogers framework facilitated examination of innovation-dissemination in the context of the targeted clients' organizational structures.

### *The Rogers Model Outlined*

Rogers (1995) defined diffusion as "the process by which an *innovation* is *communicated* through certain *channels* over *time* among the members of a *social system*" [italics added] (p.5). Although dissemination was conceptually a subset of diffusion, Rogers used the terms synonymously. He explained that in the past, diffusing innovations encompassed both planned and spontaneous diffusions; whereas, dissemination included only planned or formalized communication or spreading strategies. Nonetheless, he pointed out that usage over time had made the two terms interchangeable. Because NCRVE/UCB's primary function was to strategically promote and market products which Center teams had carefully researched and developed, I chose to use the more precise term *dissemination* when referring to the Center's function.

### *Delimitations and Definition of Terms*

The key italicized terms in Rogers' (1995) definition of diffusion--*innovation*, *communication channels*, *time*, and *social system*--were defined by Rogers as shown below. I re-framed them in the context of this study.

1. An *innovation* is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995, p.11). In education, reform initiatives in a multiplicity of designs and purposes fall under the rubric of innovation. For purposes of this research, *innovation* was limited to the products developed by the

National Center for purposes of facilitating the positive impact of changes in vocational-technical education.

2. *Communication channels* "are the means through which knowledge about innovations are conveyed" (p.18) and may influence the rate of adoption. Rogers asserted that mass media tended to be more effective at the *knowledge* stage of diffusion, while opinion leaders via interpersonal contact were more effective in persuading people to adopt. Accordingly, leaving out one of the channels or reversing their placement in the stages of diffusion usually slowed the rate of diffusion, while appropriate placement of both channels increased it. This investigation encompassed as *communication channels* only the media selected by the Center to diffuse its products.

3. *Time* refers to the rate or speed of adoption by potential users. According to Rogers (1995) it was represented numerically as "the steepness of the curve" (p.206). The time-line begins after the development stage and depicts the number of adoptions per designated time-unit until the point at which the highest number of adoptions in a single time unit has peaked and begun to decline steadily. The curve that typically manifested itself in most diffusion studies reviewed by Rogers (1995) was the S-shaped or sigmoidal-distribution curve. The *rate of adoption* of the selected National Center products were measured by the time-lapse in years from 1993, the first year of sales, to 1996, the most recent year for which total sales could be tabulated, and by which time the sales had likely declined.

4. *Social System* refers to "a set of interrelated units that are engaged in joint problem-solving to accomplish a goal" (p. 23). The units may consist of individuals or

groups organized according to accepted structures and norms. Rogers (1995) noted that "the social or communication structure of a system facilitates [or impedes] the diffusion of innovations in the system" (p.37). For purposes of this investigation, I confined the social system scope to the target audiences designated by the National Center as potential purchasers or users (adopters) of its products.

In addition to the italicized terms shown above in Rogers' definition of the diffusion of innovation process, the *attributes* of innovations have been similarly conceptualized as generic constructs that cross all disciplines. Having carefully collected and reviewed scores of studies supporting this generalization, Rogers (1995) identified and described the generic attributes as follows:

1. *Relative advantage* is "the degree to which an innovation is perceived as being better than" (Rogers, 1995, p. 212) a competing or preceding idea.

2. *Compatibility* is the "degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of the potential adopters" (p. 224).

Citing Arensburg and Niehoff (1964), Rogers observed:

A negative experience with one innovation can damn the adoption of future innovations. . . . When one innovation fails, potential adopters are conditioned to view all future innovations with apprehension. . . . For this reason, change agents should begin their efforts with a particular audience with an innovation that has a high degree of relative advantage, so that they can build successively on this initial success (Rogers, 1995, p. 228).

Another dimension of compatibility is what Rogers called "needs" compatibility.

He explained this construct as the matching up of the innovation with the perceived needs of the potential adopters. Accordingly, he asserted that change agents

needed “a high degree of empathy and rapport with their clients, . . . [because] potential adopters may not recognize . . . a need for innovation until they are aware of the new idea or of its consequences” (p.228). Moreover, Rogers concluded, “*When felt needs are met, a faster rate of adoption usually occurs*” [italics added] (p. 228).

Another element of *perceived compatibility* identified by Rogers as affecting the rate of adoption is the "name" that is given to the innovation. He believed that "inadequate attention has been paid to what innovations are called by potential adopters, and as a result many serious mistakes have been made" (p. 236). Moreover, Rogers pointed to the demonstrated effectiveness of market-testing product names prior to product-release in the for-profit sector of society. He contrasted the private, for-profit practice with the practice of public sector, non-profit change agencies and concluded that the latter "generally have not realized the importance of what an innovation is called, at least until the social marketing approach began to gain attention in recent years . . ." (p.236). Rogers recommended "a receiver-oriented, empirical approach to naming an innovation, so that the word symbol for a new idea has the desired meaning for the intended audience" (p. 237).

3. *Complexity* is defined as the "degree to which an innovation is perceived as relatively difficult to understand and use" (p. 242). Innovations can be ranked on a numerically ascending scale that designates the lowest number as the simplest and the highest number as the most complex. Accordingly, Rogers (1995) accrued



evidence to support his logic relative to this attribute--namely, that the more complex the innovation, as perceived by users, the less likely it was to be adopted.

4. *Trialability* is "the degree to which an innovation may be experimented with on a limited basis" (p. 243). Rogers' studies found that "The trialability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption. Early adopters are models for later adopters" (p. 243).

5. *Observability* is an attribute which can be "seen" in the process of being used or tried out by others. Observing others using the innovation not only increases "its probability of being adopted, but it also strengthens the perceived ability to judge whether an innovation has a relative advantage over another, whether it is compatible with existing [or previous similar innovations], and whether or not it is sufficiently simple to understand and implement" (p. 244).

## Organizational Framework

### *Research Design in Context*

#### *NCRVE Analogues in Diffusion Paradigm*

Viewing NCRVE's product development and dissemination process in the context of Rogers' diffusion-of-innovation paradigm requires an understanding of how the component parts of the diffusion process as defined by Rogers are conceptually analogous to components that make up the NCRVE/UCB dissemination-of-products process. NCRVE is a change agency, dedicated to innovation in vocational education. The Center is comprised of eight member-institutions, strategically dispersed in almost

all regions of the nation, with the University of California at Berkeley assuming the role of lead institution. The National Center's mission is two-faceted: one, preparing all individuals for productive, sustained, and rewarding employment; and two, facilitating the shift "to an economy dominated by a skilled and flexible workforce, one that maximizes both global competitiveness and individual potential, in which firms use more skilled and productive workers and provide the appropriate incentives for education and training" (NCRVE *Products*, 1996, p.1).

*Innovation-development.* According to Rogers (1995), the *innovation-development process* consists of six main phases, the first four of which originate from the change agency, which in this study is NCRVE. Thus, in phase 1 the Center recognizes a problem or need--current or anticipated. This gives rise to research studies (phase 2) which lead to the development of the innovation to meet the need (phase 3). Then in phase 4 NCRVE insures commercial viability by pilot-testing the products and modifying them as needed. Phases 5 and 6 of the *innovation-development process* overlap with the *innovation-decision process*. Flowing from the change agency perspective, phase 5 is disseminating the products to the designated social system, defined by NCRVE as consisting of six key groups of stakeholders in a variety of functional areas: (a) colleges and (b) universities (involved in research and development activities related to vocational education), (c) secondary and post-secondary institutions (vocational-technical or others containing equivalent courses or curricula), (d) individual practitioners of vocational education (e) business and industry leaders, and (f) policy makers or government leaders.

Phase 6 is assessment of impact or consequences. Although the Center has focused less on phase 6, it has produced some impact studies of selected leadership products. More generally, assessment of the overall agency's mission is outlined in NCRVE's research and development agenda and includes analyzing vocational education policies and needs in the context of important impacting components: (a) changes in the economy; (b) changes in institutional structures (especially families, workplaces, and schools), (c) changes in curricula and pedagogical needs and practices, (b) changes in the demographics of students, (d) changes in vocational education personnel, and (e) changes in accountability and assessment needs. These have shaped the research and development as well as the dissemination and training arms of NCRVE, of which dissemination is a program area in the latter. As such it is responsible for the planned dissemination of all products developed by the National Center (NCRVE *Products*, 1996). Moreover, the dissemination section of the NCRVE quarterly reports reflects a process analogous to diffusion-of-innovation as described by both the *innovation-development process* and the *innovation-decision* process.

*Innovation-decision.* The *innovation-decision process* consists of stages that flow from the potential adopters in the social system: one, knowledge of the innovation; two, formation of positive or negative opinions about or attitudes towards the innovation (persuasion); three, decision to adopt or not adopt an innovation; four, implementation of the innovation; five, confirmation or reconsideration if new information deems appropriate. *Communication channels* link each of the stages listed above (Rogers, 1995).

*Quarterly reports as composite log.* NCRVE's quarterly reports show not only the categories of adopters, but also the channels by which the products are disseminated, with quantitative outcome measures for units sold and sundry supporting marketing and promotional activities. The Center's quarterly dissemination reports are therefore like topographical maps tracing the dissemination paths that connect the Center's products and development process with targeted clients. Thus, the dissemination process is analogous to Rogers' diffusion-of-innovation model. It follows then that inferences can be drawn if Rogers' generalizations obtain when tested with NCRVE's analogous elements. The reports depict information in categories comparable to Rogers' diffusion analogues.

*Annual reports.* The descriptive, statistical overview and contextual backdrop for this study derived from (a) the Center's four annual reports and the only six quarterly dissemination reports that I could access for the years 1993, 1994, 1995, and 1996; (b) its 1996 Catalogue of Products; (c) its on-going communication and publicity programs in all media; and (d) special projects or other marketing initiatives used in the dissemination and training arm of the Center.

#### *Investigative Questions and Methodology*

From the quarterly reports and other Center publications, a number of investigative challenges presented themselves--questions to confirm or disconfirm the Rogers generalizations when tested using comparable NCRVE/UCB components. The four Center categories and their Rogers' analogues are as follows: (a) NCRVE's targeted purchasers--individuals and groups--as comprising the universe of most potential adopters, (b) NCRVE products as innovations diffused by NCRVE over time through

designated channels to the targeted adopter groups comprising the social system, (c) NCRVE as a change-agency organization, and (d) NCRVE's formal dissemination process as communication channels of diffusion. From these, numerous research questions worthy of investigation emerged. Only those from categories *a* and *b*, however, were feasible for me as a solo researcher to undertake at the present time. Nevertheless, the other areas provide excellent starter fuel for Center personnel who may wish to launch self-directed impact studies. Some are therefore included in the last chapter of this study as areas for possible future research. Categories *a* and *b* are listed below with their ensuing research questions.

*Targeted audiences as the social system and the universe of potential adopters.*

Rogers (1995) noted that he had reviewed hundreds of research studies about the social system into which innovations were diffused. In the process he had discovered how to distinguish the members who tended to form opinions about innovations early from those who took much longer to form their opinions. Based on findings from these studies, he generalized that adopter categories of successful innovations (innovations adopted in whole or in part by almost all members of the targeted social system) tended to be normally distributed, and that the rate of adoption generally conformed to the first half of that bell-shaped curve which is a sigmoidal (S) shape.

Additionally, Rogers (1995) found that when institutions and organizations selected innovations to implement in their respective workplaces the decisions to adopt often required collective decision-making or higher levels of approval even if the initial decision was that of a single individual. Examining NCRVE's analogous social system,

defined as the six categories of purchasers itemized in the quarterly reports, precipitated Research Questions #1 and #2.

1. *To what extent did unit sales figures for products disseminated from 1993-1996 follow the sigmoidal (S-shaped) distribution?*

The second research question that I explored also issued from NCRVE's targeted audience being analogous to Rogers' social system:

2. *To what extent were the early users of the products members of institutions that facilitated innovation and autonomy in decisions related to new product purchases?*

In other words, did the early users in this study represent organizations or institutions with flat or reduced layers of management and flexible policies--characteristics that encouraged autonomous decision-making and expedited faster turn-around for purchase requests?

*NCRVE products as innovations.* In this multidimensional research category, I explored Rogers' attributes-of-innovations as a construct with generic components comparable to those of selected NCRVE products. By doing so, I derived the answer to the overarching research question #3 below:

3. *Were the perceived attributes of selected National Center products comparable to their generic analogues in the Rogers model, and did they function similarly in terms of influencing the extent of dissemination among targeted users?*

This question necessitated a closer look at the Rogers (1995) outline of the factors that affect the extent of dissemination of innovations. Rogers (1995) revealed that hundreds of studies supported his generalization that the attributes of the diverse innovations investigated could be generically categorized as the five attributes listed in the model: "*compatibility, relative advantage, complexity, trialability, and observability*" (p.207). From this he extrapolated that "individual receivers' perceptions of these attributes" (p.250) influenced the extent of the innovation's dissemination.

#### *Synopsis of Investigative Parameters*

In summary, I explored in this investigation the applicability of three Rogers constructs--sigmoidal distribution, targeted social system, and attributes-of-innovations--to selected NCRVE/UCB products. First, to what extent did the selected products, published during the fourth quarter of 1992 and subsequently disseminated, conform to the S-shaped distribution curve as predicated by Rogers? Second, did other factors, such as organizational structures of user entities influence the extent of the innovation's dissemination? Concomitantly, and equally as important, how well did the attributes of the two selected products dovetail with their generic analogues in the Rogers template, and did the products' attributes similarly influence product acceptance as theorized by Rogers? The findings that I uncovered during the investigation provide new knowledge in dissemination theory--knowledge that researchers can apply as they replicate the study using other products--knowledge that change agencies can advantageously harness in future dissemination efforts.

## Chapter Summary

I began Chapter 1 by describing how the public perceived American education in the 1980s—namely, as a dysfunctional anachronism badly in need of systemic reform. Citing the chorus of critical voices that spawned voluminous studies by research centers and institutes, I noted particularly that one such research center, NCRVE/UCB was charged primarily with effecting positive changes in the education-for-work arena by disseminating research findings for optimal applied value. Moreover, I explained how the criticisms resulted in the prolific growth of literature on educational change which in turn yielded sundry configurations of conceptual models, including the Rogers template which I selected for this investigation. After then outlining the organizational framework and the proposed parameters for this study, including the definition of terms, I posited three research questions--questions that emanated from the Rogers template and his well-documented generalizations. The remaining sections of this report include Chapter 2, a review of the literature; Chapter 3, an explanation of the research methodology adopted and the rationale for its use--including how the information was collected and analyzed; Chapter 4, the results of the investigation--answers to the research questions posited earlier; and finally, Chapter 5, a summary conclusion that reiterates the key findings and their implications, and offers recommendations for professional practice and future research.



## Chapter 2

### A REVIEW OF THE LITERATURE

#### Overview

Interconnectedness and globalization permeate every aspect of society today. The phenomenon of diffusing change is no exception. Hence, I begin this review of the literature by focusing on the broader, interdisciplinary diffusion-of-innovation research, distinguished by numerous multi-domain studies that dot the literary landscape. A single diffusion-of-innovation construct thereby emerges—one which unifies the different domains, and about which much has been learned, thanks in large part to four decades of stellar research by the renown guru in the field, Everett M. Rogers. Next, I shift the review-lens from the panoramic wide-angle scope to a narrower, more defined focus on educational innovation research, then to the even more precise nature of vocational-technical innovation research. Finally, the I use the close-up function to frame with clarity the selectively winnowed research base that informed and shaped the delimited parameters of this study.

## The Macro-View

### *Marked Increase in Diffusion Research*

Research related to the process of diffusing product and process innovations increased exponentially after Everett M. Rogers published the seminal 1962 first edition of the encyclopedic volume, *Diffusion of Innovation*. Studies from a variety of domains added to the knowledge base on which the phenomenon of change could be assessed. Among the domains that constituted the base of empirical research knowledge about a common underlying construct--diffusion of innovation--were marketing and management (Palda, 1966; Schaller, 1972); anthropology, sociology, science, technology, communications, and education (Rogers & Shoemaker, 1971). At the time of the Rogers and Shoemaker, 1971 publication of *Communication: A Cross-Cultural Approach*, the number of research studies had exploded to almost 1500.

### *Salient Observations Emerged*

From the increased data base of studies, two salient observations emerged: First, the 1962 theories and concepts, born primarily from studies in agriculture in the United States, were largely validated cross-culturally in numerous developing countries by 1971: "Today, we can offer definite support that the diffusion models of 1962 are not entirely culture-bound," (Rogers & Shoemaker, 1971, p. xvii). Second, the need to integrate and synthesize diffusion research from numerous disciplines necessitated adopting a conceptual framework designed from a communication viewpoint. Rogers and Shoemaker (1971) felt that the communication viewpoint provided "an advantage of conceptual clarity as well as ease of wide expression," (p. xviii). Thus, they defined

*diffusion* as " a special type of communication . . . the process by which innovations spread to the members of a social system" (p. 12). *Diffusion research*, the authors contended, was ". . . that subset of communication research dealing with the transfer of new ideas" (p.12). Moreover, the authors iterated and clarified their goal of showing that "Diffusion research results have a great deal in common," (p. xviii) in spite of the wide array of innovations studied by researchers from multiple academic disciplines.

#### *Societal Pressures Spur the 1980s and 1990s Research Efforts*

##### *Public Sector Parallels Private Sector*

The third and fourth editions listed diffusion publications numbering approximately 3,000 and 4,000, respectively (Rogers,1983, 1995). The 1980s were marked by organizational pressures to be competitive and the attendant consuming desire to find out how to optimize organizational changes and marketing strategies in order to achieve important competitive advantages (Brancheau, 1988; Kanter, 1988a, 1988b; Keller & Windford, 1983; Meyer & Goes, 1988; Sonnichsen, 1989). The passion to effect positive organizational changes spread from the corporate boardrooms to city halls and other non-profit institutions (Hall & Hord, 1987; Maynard-Moody, 1989; Mendell & Ennis, 1985; Rogers, 1983). The early 1990s were equally productive in diffusion-centered research from many disciplines (Afuah & Bahram, 1993; Chidamber & Kon, 1993; Davenport, 1993; Drucker, 1993; Goes & Park, 1993; Kearns, 1992; Kirkpatrick, 1994; Kralewski et al., 1992; Michaelson, 1993; Moore & Benblast, 1991; Nariman, 1993; Utterback, 1993; and Van de Ven, 1990).

##### *Paradoxical Trend Yields Recommendations*

In the 1995 edition, Rogers discerned a paradoxical trend. Diffusion studies were rapidly expanding in quantity and prestige, while concomitantly fielding more criticisms from practiced and potential scholars and experts. Hence, Rogers (1995) pointed to several aspects of diffusion that needed further investigation and offered the following suggestion for researchers:

1. In an after-the-fact study design, compare a successfully diffused innovation with one that was just moderately or not-at-all successful in diffusing as anticipated. "Such a comparative analysis would help illuminate the seriousness of the pro-innovation bias," (p.107). Additionally, it would also help to identify potential pitfalls and barriers to diffusion that may require changing some strategies or implementation practices in future similar diffusions.

2. Investigate the broader political, social, and policy-oriented contexts surrounding diffusion of a given innovation. According to Rogers, this is a trend of growing importance and investigators should look for "how the initial policy decision is made to diffuse the innovation . . . how public policies affect the rate of diffusion,. how the innovation is related to other innovations and to the existing practice(s) that it replaces, and how it was decided to conduct the R & D that led to the innovation in the first place. . . [ helping ] illuminate the broader system in which the diffusion process occurs" (p.109).

3. Learn more about what motivates individuals and groups to adopt innovations by asking more "why?" questions--questions not conducive to the survey methodology employed in most of the past studies. "In the past, we diffusion researchers placed an

over reliance upon models of diffusion that are too rationalistic [and linear]. The unfortunate consequence is that we often assumed that all adopters perceive an innovation in a positive light, as we ourselves may perceive it" (p.111).

Rogers noted that in over half of the diffusion studies, the dependent variable--the one of most concern to the researcher--was innovativeness, implying albeit subtly, that causality may exist between the independent variables and innovativeness. The cross-sectional survey data on which most of these diffusion studies were based, could not sufficiently answer the "why?" questions undergirding causality. Moreover, while recommending field experiments as sound methodology in diffusion research, he also applauded personal interviews, pointing out that they were more complete than surveys and usually garnered more valuable insights. To overcome the recall problem, Rogers recommended data gathering at multiple points during the diffusion process, facilitating recall accuracy. Alternatively, he offered the "point-of-adoption" strategy that gathers the pertinent data relevant to "why?" questions at the point-of-adoption. Thus, from the macro-perspective, the phenomenon of diffusion-of-innovation, was broadly explored and well documented by Rogers. His interdisciplinary research spanned four decades and uncovered 11 diffusion traditions and eight types of diffusion analyses; these he explained and summarized with clarity in tables that identified the significant factors related to each discipline and each type of analysis. To examine specific education-domain traditions, I adjusted the literary lens from the wide-angle macro-perspective to the narrower micro-perspective discussed next.

## The Micro-View

### *Early Assessments: 1940s-1960s*

Public education for the masses began as an innovation in America, and changes have been forthcoming in varying degrees ever since. Mort and Cornell (1941) and Mort (1953) documented critical assessments of the education systems in America that began early in the century. Again in 1964, Mort catalogued the innovations in education from the 1930s; he concluded that a 50-year time lag was typical from perception of need for change to the introduction and diffusion of an innovation to meet that need (Mort, 1964). Anderson (1966) estimated 30 years to be the average time for innovations to be accepted in education. Miles (1964) edited a collection of reports regarding the status of educational innovation. Oscarson (1976) cited findings by Lippitt and Havelock (1968) which underscored the importance of integrating the teacher into the loop of education-change decisions.

### *Diffusion Steps Outlined*

Oscarson (1976) also outlined the resultant diffusion procedures derived from the Lippitt and Havelock findings: (a) Be sure the innovation is sufficiently developed and tested and the teacher or other target user is trained to use the innovation properly before being asked to use it; (b) be sure the target user has exhibited or expressed a desire to use the innovation; (c) be sure to give extra support to the implementing user during the initial stage when risk is high; and (d) insure continued feedback regularly thereafter, with support as needed, and in the framework of mutually agreed upon measures of success.

### *Factors Associated with Rate of Change*

The speed of change or the rate of adopting new education reforms was described by Carlson (1965) as being a function of three factors: (a) the attributes of the adopter--whether a person or school or system; (b) the method of connection or communication channels that exist between the adopter and the source of the innovation; and (c) the adopter's prestige or status among peers. He did not mention the characteristics of the innovation itself as even a possible factor. Yet in his first edition of *Diffusion of Innovations*, Rogers (1962) had cited evidence showing that, in non-education innovations, the characteristics of the innovation itself weighed heavily in its extent of adoption. Moreover, he had surveyed the status of educational innovation research and reported these deficits: (a) Most studies were conducted in and belonged to individual colleges and universities; (b) few studies had used the classroom teacher--whose influence is critical--as the adopter; and (c) the lack of sufficient empirical research studies in the data base of educational innovations had impeded the rate of diffusion of educational innovations when compared to those in agriculture, medicine, and business.

### *The 1970s Education Research*

#### *Issues Addressed*

In the 1970s issues regarding education reform precipitated further studies of innovation diffusion. Several issues, fraught with conflict and concern, were researched and innovative solutions developed: (a) how students learn and how best to prepare teachers who teach them, (b) how to cope with exponentially expanding growth in technology and knowledge, and (c) how to insure equality of educational opportunities

for all students, regardless of race, ethnicity, gender, handicap, or socio-economic background (Rich, 1978; Rogers & Shoemaker, 1971; Rogers, 1983).

### *Types of Conceptual Models Used*

The Skinner behavioral-based programmed instruction of the 1960s was superseded by open classrooms and other instructional strategies based on dynamic egalitarian and cultural diversity trends and affective/behavioral/cognitive learning models, mediated in many cases by more comprehensive technology design systems purported to facilitate both teaching and learning (Dick, 1995; Hope, 1996). One such effort involved a competency-based innovative model purported to diffuse itself, and offered on the assumption that "potential adopters of innovations in education are in need of reliable data concerning prescriptive diffusion strategies in addition to information regarding the innovation itself" (Meehan, 1976). The study of how to effect positive changes in schools from the perspectives of administrators and teachers in a variety of class sizes, school sizes, and demographics became the focus of numerous studies of educational innovation in the 1970s, fueled in part by government-funded research centers (Bennett, 1974; Gross et al., 1971; Havelock, 1972, 1973; Hultman, 1979; Hull, Kester, & Martin, 1973; McCaslin & Walton, 1973; Oscarson, 1976; Owens & Steinhoff, 1976; Page, 1976; and Roberts, 1975). Nevertheless, change in education continued to be slow and tenuous for most of the public education systems in existence (Rich, 1978; Rogers, 1983).

### *Rogers' Post-1970's Education Research*



Education was one of eleven disciplines reviewed again by Rogers in his 1995 edition of *Diffusion of Innovations*. According to his figures, education accounted for approximately 9% of all diffusion research investigations. This compared to 4% for anthropology, 22% for rural sociology, 7% for public health and medical sociology, 12% for communication, 15% for marketing and management, 4% for geography, 8% for general sociology, 5% for general economics, and 14% for miscellaneous other disciplines (Rogers, 1995).

#### *Education and Private Sector Parallels*

Additional research in educational change was spawned by the emergence of fiscal conservatism in national politics and critical assessments of educational institutions nationwide as previously mentioned. Reforms paralleling those in the private sector corporations were being heralded--tested or untested--as panaceas for the crippled but 'sacred cow'--public schooling. Voices of reason, though often muted amid clamors for more radical changes or total return to the basics, were couched in numerous impressive studies by research centers and universities (Finch & McGough, 1983; Hall & Hord, 1987; Halpern & Associates, 1994; Hope, 1996; Hall et al., 1986; Hull & Parnell, 1991; Nariman, 1993; and Van de Ven, 1990).

#### *Focus of Education Research Tradition*

The Rogers' (1995) tabular rendition of diffusion traditions pointed out that the education diffusion research tradition was characterized by (a) typical innovations under study being those of a teaching/learning nature such as "kindergartens, modern math, programmed instruction, team teaching" (p.43); (b) a methodology consisting mostly of

survey questionnaires and interviews, followed by a statistical analysis; (c) the main units of analysis being comprised mostly of "school systems, teachers, or administrators" (p.42); and (d) the major types of findings relayed as "S-shaped adopter distribution, characteristics of adopter categories" (p.43).

*The agricultural template.* As noted in Chapter 1, Rogers (1995) pointed out in a footnote that 150 of the 845 rural sociology publications of diffusion research were generated by the agriculture extension service. Moreover, my review of the education literature disclosed that C. F. Bennett, an extension service researcher developed a template for subsequent education diffusion models. The template model, described in *How to Analyze Impacts of Extension Programs*, was widely adopted in agricultural- and occupational-educational research efforts, including impact studies related to vocational education. In rural communities vocational education had been nurtured and shaped by agriculture extension's contextual learning and experimentation paradigm (Bennett, 1974; Schroder et al., 1995). Below are several relevant vocational education research studies and the conceptual models that framed them.

## Vocational-Technical Education Research

### *Early Linear Models*

During the 1970s, several researchers undertook to examine aspects of diffusion of innovation in vocational-technical education, primarily using linear models of behavioral change. In *Factors Associated with Vocational Teacher Proneness Toward the Adoption of Innovations*, Oscarson (1976), tested an antecedent condition--personal

attributes of vocational teachers--as contributing to the propensity to adopt innovations. He cited Hull et al. (1973) as having first tailored the Rogers and Shoemaker (1971) model to vocational education by placing importance on the antecedent condition of targeted consumers. Additionally, Oscarson pointed to studies by Leithwood and Russell (1972) which found the teacher "as a primary decision maker . . . and the school, the class, and the individual pupil are considered in the curriculum evaluation process, resulting in a shorter feedback loop in gathering relevant data" (Oscarson, 1976, p.20). Moreover, Oscarson concurred with Rogers and Shoemaker (1971), McDonnell (1968), Chambliss (1968), and Rafky and Beckerman (1971), that attitudes "can be useful for measuring innovative and normative dimensions . . . [and are] important variables when considering adoption of innovations . . . useful, directly reliable, and a valid test for the change process" (Oscarson, 1976, p.41).

#### *Early Research and NCRVE*

A dominant early player in the education-for-work arena was the National Center for Research in Vocational Education/Ohio State University, Columbus, Ohio. Although the Center's contributions to research were impressive, assessment of the extent of the spread of those contributions among the targeted audiences was less well-documented, although some studies did attempt to measure impact of some documents. One such study was undertaken by Page (1973), as part of a larger three-part investigation attempting to assess the impact of products diffused through the established dissemination channels of the National Center for Research in Vocational Education

(NCRVE/OSU)--the organization most heavily involved in researching, developing, and diffusing innovations related to vocational-technical education.

### *Dissemination Highlighted*

The results of the Page study were published in a 1976 article in the *Journal of Industrial Teacher Education*. Page recognized the need for education centers such as NCRVE to evaluate the effectiveness of the process by which they disseminated the products of their research and development findings. The products being disseminated had been thoroughly researched and pilot-tested for results prior to dissemination. Hence, the more important focus was rightfully on ascertaining what factors impacted the extent to which target-audiences learned about the products, requested follow-up information, and used the products accordingly.

### *Theoretical Models Operationalized*

Page identified four models rooted in well-researched cognitive-affective-behavioral theory and operationalized in stages of the dissemination and adoption process: (a) Palda's (1966) Hierarchy-of-Effects Model ranked the stages by levels of intensity from the lowest to the highest as awareness, knowledge, liking, preference, conviction, purchase; (b) Rogers' (1962) Adoption Process Model identified four similar stages--awareness, interest, evaluation, and trial; (c) Rogers' and Shoemaker's (1971) subsequent Adoption Process Model #2 reconfigured the earlier model into steps designated as knowledge, persuasion, decision, and confirmation; finally, (d) Robertson's (1971) Summary Model described eight steps in the adoption process--

problem perception, awareness, comprehension, attitude, legitimation, trial, adoption, and dissonance. The steps in all of the models assumed linearity of behaviors.

*Impact from perspectives of consumers and administrators.* Although all four models were well grounded in theory, only the Robertson model, according to Page, depicted consumer need as propelling the creation and dissemination of the product. Additionally, Page noted that "In the field of education, the consumers are usually students; however, virtually all innovations must be channeled through administrators and no one is certain what variables affect how the administrators adopt innovations, such as training materials and informational documents" (Page, 1976, p.29). He hypothesized that differences in impact could be a function of the interaction between state and local education leaders and the types of products being disseminated.

*Diffusion-process variables used.* Page used (a) knowledge of the product (cognitive domain), (b) attitude toward the product (affective domain), and (c) adoption or non-adoption of the product (behavioral domain) as the key diffusion process variables in his impact investigation. His study was undertaken as part of a broader impact evaluation study conducted by N. L. McCaslin and J. R. Walton in 1973: *The Impact of a Vocational Education Information Document: Cognitive, Affective, and Behavioral Effects*. Page's findings revealed that state and local education administrators were approximately equivalent in their knowledge of and attitudes about the training materials and informational documents that had been sent unsolicited to them. In discussing the implication of his findings, Page noted that low usage negated somewhat the positive attitudes. Still, he pointed out that the respondents in the study had not solicited the

products--hence, a need to use them had not been established; therefore, he suggested, subsequent products could be announced more broadly by sending post cards or flyers to potential users of whom only those with a need for the products would request the products themselves.

*Need for tracking system.* The broader McCaslin & Walton (1973) study replicated on a larger scale one segment of the Page study and confirmed his findings. In doing so, the authors uncovered several problem areas and offered recommendations for ways to resolve them. One was the absence of a tracking system to identify users who either purchase the products or who borrow the products from libraries or other individuals. Because such users were more likely to use the products than those who received free copies, total impact was likely underestimated in that study. The authors supported the use of unobtrusive observation in future research to help gauge the extent of impact among library users and borrowers of products from other individuals.

*Need to clarify meaning of impact* A second problem was the limited-scope definition of impact used in the study. ". . . cognitive, affective, and behavioral effects that resulted from exposure to the publication," (McCaslin & Walton, 1973, p.62). The authors illustrated the inadequacy of the definition by citing an example: ". . . an individual receives an informational document, examines it briefly, and decides it is of no value to him. He then gives it to a colleague or puts it in a bookcase, and forgets about it" (p.62). McCaslin and Walton maintained that "The present definition considers this activity behavioral impact" (p.62). In conclusion they called for modification of the definition in order to assuage the nebulous effects.

### *Recent Vocational-Technical Reform Studies*

More recently, two research studies (Aneke, 1996; Long, 1994) investigated the impact of teacher roles and concerns on school reforms designed to create exemplary workers--workers prepared to compete in a rapidly changing, highly technological, and globally competitive 21st century marketplace.

*Tech-prep assessed.* Long (1994) investigated the diffusion of tech-prep as an innovation in selected Virginia school systems. Using a segment of the Concerns-Based Adoption Model (CBAM), developed by the University of Texas Research and Development Center to facilitate change in education, Long searched for answers to questions that related to adopter readiness and willingness to adopt and/or implement an innovative educational process: tech-prep. Additionally, she noted that most of the recent educational-change research had focused on the importance of the teacher-functions rather than the human aspects of the teachers. Citing a 1993 study by Dennison, Long observed that "America, once rich in technical skills, can reclaim the competitiveness in the global economy through improving technical skills and productivity" (Long, 1994, p.27). Therefore, she concluded, "It is imperative that vocational and technical education become a part of educational change to meet the emerging demands of the workforce and the global market" (p.27).

*Virginia HSTW initiative assessed.* Aneke (1996) used a school-wide reform initiative to test Hall, Wallace, and Dossette's adaptation of the CBAM stages-of-concern

theory to education. Investigating vocational and academic teachers at 19 schools which were implementing the High-Schools-That-Work (HSTW) reform program in Virginia, he found that the type and intensity of teacher concerns varied with both experience and training in reform-related practices, as well as with their adoption-proneness scores.

Aneke reasoned that the complexities of contemporary workplace requirements will demand flexible, confident teachers--teachers amenable to new ideas and better ways of facilitating learning among all students. Such teacher-attributes will only be cultivated by addressing teacher-concerns--a task best accomplished, the author suggested, by providing reform-related training and experience, beginning with the opinion leaders identified by the adoption-proneness scores.

#### *NCRVE's Contemporary Role*

Fifteen years after the 1973 impact studies alluded to earlier, the National Center for Research in Vocational Education was restructured, relocated, and restaffed. The new National Center, headquartered at the University of California, Berkeley, cultivated new turf and countenanced changing directions that yielded dynamic new synergies in research and dissemination of vocational education innovations. Writing in 1995, two Center spokespersons described the new dynamics at work:

The sea change of educational reform is moving toward multiple goals: holding high expectations for all students, integrating subject matter across disciplines, focusing on problem solving and cooperative skills, differentiating curricula on the basis of occupations with high-end skills, employing a range of technology as learning tools, building professional learning communities, integrating community and social services, and holding educators accountable for results (Seidman & Ramsey, 1995, p, 235).



The Center's current products-catalogue lists the many publications which have been generated from exhaustive research, and where appropriate, pilot-tested for workability. But concomitant synergies have been less prolific in evaluating the impact of voluminous products that have been developed and disseminated since NCRVE's restructuring. Yet such an assessment would be especially advantageous in view of increasing expectations described above and the attendant pressures on research centers to provide more value for each taxpayer dollar expended in educational research and to optimize the benefits of programs and products that evolve from that research.

### *The Present Study*

#### *Comprehensive Nature of Framework Selected*

My investigation has partially rectified that oversight and, in so doing, benefits the National Center's on-going activities. More importantly, though, by providing a framework for comprehensively studying the nature and extent of dissemination of educational innovations, this research contributes to the growing body of knowledge about diffusion-of-innovations--critical knowledge for (a) minimizing the time-line from research findings to research application, (b) maximizing market penetration, and hence, (c) optimizing societal benefits derived from such innovations. The framework I used dovetails with the Rogers diffusion-of-innovation model.

#### *Quantitative and Qualitative Approaches Supported*

Several empirical methods of research and analyses were supported by the Rogers (1995) review and synthesis of the literature, including both quantitative and qualitative approaches. Among the latter were (a) case-studies of the diffusion process comparing

multiple organizations or individuals, providing the necessary validity checks; and (b) a comparative after-the-fact study design of successful and unsuccessful product-innovation diffusions. These techniques were well suited to the restricted parameters of this study, and I harnessed them accordingly. In doing so, I drew upon additional qualitative research strategies described by Yin (1989) and Silverman (1993) and successfully employed in numerous investigations in a variety of domains (Chidamber & Kon, 1993; Davenport, 1993; Dimancescu & Dwenger, 1996; Drucker, 1993; Goes & Park, 1993; Kanter, 1988a, 1988b; Kearns, 1992; Keller, 1983; Kirkpatrick, 1994; Kralewski et al., 1992; Lasonin & Finch, 1995; Maynard-Moody, 1989; Myer & Goes, 1988; Mendell & Ennis, 1985; Michaelson, 1993; Nariman, 1993; Schmidt et al., 1992; Sonnichsen, 1989). My strategic use of a qualitative approach for this investigation is discussed more fully in the methodology section (Chapter 3).

### Chapter Summary

Using a macro research lens, I first described innovation diffusion as a single construct unifying multiple domains, and about which much has been discovered and publicized via the eminent guru in the field, Everett M. Rogers. Then I shifted to a narrower micro-view, focusing first on education; second, on a more defined arena of education--education-for-work; and finally, zooming in even closer to view a specific frame within vocational-technical education--namely, the National Center for Research in Vocational Education, the agency most responsible for innovation in the education-for-

work arena. As I examined the literature from these perspectives, I discovered gaps in the research that needed to be filled--gaps that prompted the current study.

## Chapter 3

### RESEARCH METHODOLOGY

#### Introduction

In this chapter, I describe the study's overall research design and explain how the methodological approaches suffused therein ultimately led to my shaping and refining the investigative challenges posited in Chapter 1. First, I delineate the careful winnowing-down process by which I (a) reduced the research possibilities to a manageable number, and (b) selected which product-dissemination patterns to investigate. This process led to my slightly modifying the first of the three research questions posited in Chapter 1 and reiterated as modified below:

***Research Question #1:*** To what extent did the unit-sales of the implementable leadership products published in fourth quarter of 1992 follow the sigmoidal (S-shaped) distribution as predicated by the Rogers model?

***Research Question #2:*** To what extent were the early users of the products also members of institutions that facilitated innovation and autonomy in decisions related to new-product purchases?

***Research Question #3:*** Were the perceived attributes of selected National Center products comparable to their generic analogues in the Rogers model, and did they function similarly in terms of influencing the extent of dissemination among targeted users?

Second, I explain how an eclectic research design—quantitative and qualitative in nature—evolved from the reconfigured research parameters and refined questions. The discussion includes how I ascertained that case-study research was both intellectually rigorous and particularly well-suited for this investigation. Third, I explain why the semi-structured telephone interview was especially befitting for this study and how I crafted, refined, and used the questionnaire instrument to gather the information. Finally, I discuss how the information I obtained impelled me to sort and code the interviewees' responses, exposing pertinent thematic threads and facilitating my task of describing the results and arriving at conclusions and implications in Chapters 4 and 5.

#### Rationale for Delimited Investigative Scope

##### *Exploratory Review of Change Agency Role*

The research paradigm for this study evolved logically from an exploratory review of the National Center's role as a change agency dedicated to a two-faceted mission: (a) preparing *all* individuals for productive, sustained, and rewarding employment; and (b) facilitating the shift "to an economy dominated by a skilled and flexible workforce . . ." (NCRVE *Products*, 1996, p.1). The National Center advances towards its mission in large part by disseminating well-researched publications. These publications are varied in purpose: informational items, research syntheses, and implementable interventions or programs. The targeted audiences are key groups of stakeholders in a variety of functional areas.

### *Dissemination Program Area*

"Dissemination" is a program area in the dissemination and training arm of the National Center. As such it is responsible for the planned dissemination of all products developed by the Center (NCRVE *Products*, 1996). The sundry components in the dissemination process are outlined in the "dissemination" section of the NCRVE quarterly reports; many seem analogous to components in the Rogers diffusion-of-innovation template. Specifically, the Center's targeted audiences comprise the social system of potential adopters as conceptualized by Rogers; purchasers parallel Rogers' actual adopters; marketing strategies parallel Rogers' communication channels; and some of NCRVE's disseminated products parallel Rogers' diffused innovations. Finally, the Center staff's on-going interface with targeted stakeholders finds an analogue in the networking construct conceptualized by Rogers (1995).

### *Dissemination Support Materials*

As a preliminary exploratory step, I first reviewed reflectively the Center's available quarterly dissemination reports, its current product catalogue, its on-going communication and publicity programs in all media, as well as special projects or other marketing initiatives used in the dissemination process. This review yielded a broad array of investigative challenges. Most of these challenges were worthy of further study but could not be successfully undertaken by a solo researcher constrained by time and resource factors. Hence, I logically delimited them to the three selected for this study.

## *Refining Investigative Challenges*

### *Winnowing the Scope*

First, I deduced that only products embodying *implementable* change initiatives were analogous to *innovations* as conceptualized by the Rogers diffusion-of-innovation model. Informational documents, reprints, and research syntheses are to a large extent more supportive than innovative. Additionally, I discovered that records of recipients of products--complimentary or purchased--were not sortable by product title or number and could only be traced by a manual examination of all sales and distribution records for each year. The social system of targeted audiences for all products disseminated by NCRVE included numerous sectors of professionals who would implement innovative programs and products at secondary, post-secondary, and state department levels. To search the archived records manually and identify and compile a roster of *all* the purchasers of each product was not possible.

### *Selecting Products and Participants*

*Target groups limited.* Upon further examination of the quarterly dissemination reports that were available to me, I observed that professional development was one of the five program areas around which the Center's dissemination and training agenda was organized. Since the target audience for professional development products consisted primarily of professional development leaders in university- and state-level education departments, the population of potential adopters was thereby self-limiting in scope, making a solo investigation of products diffused to such a target audience more feasible. Moreover, since educational change has traditionally percolated from university

laboratories and research centers to university- and state-level education departments charged with optimizing educational resources and outcomes for their respective states and constituents nationwide, I reasoned that this segment of the social system wielded influence disproportionate to its size and was therefore worthy of focus as potential adopters in this investigation.

*Publication life-spans limited.* The parameters of the study were further delimited by the nature of the time-line constraints inherent in contemporary publishing. The rapidly expanding body of new knowledge being generated in this highly technological and fast changing information age has led to rapid obsolescence of most published works. The typical life-span for publications disseminated as innovations in education has thus been truncated. Hence, I chose to limit the study to products published in the fourth quarter of 1992, reasoning that such products would have reached their peak in the dissemination process, having likely been supplanted by updated editions of the same or similar publications. Moreover, 1992 was the fifth year of the Berkeley Center's first 5-year grant. Thus some products released at that time had been through research and development for up to five years.

*Implementable products presented.* An examination of all the National Center's Leadership and Development Program's fourth-quarter 1992 publications revealed that only two were implementable innovations at the university or state level: (a) *Case Studies in Vocational Education Administration: Leadership in Action* was published in October, 1992, authored by C. R. Finch and others; (b) *Breakers: An Organizational Simulation for Vocational Education Professionals* was published in December of 1992, authored by



C. R. Finch. Since the nature of the study necessitated excessive references to these products, I truncated their titles in a variety of ways, to reduce redundancy. The truncated versions--used prolifically in the pages of this report--facilitate readability: *Breakers Simulation, Case Studies, Leadership Case Studies, Leadership Simulation, Cases, and Simulation.*

#### *The Products Described*

In the interest of honest disclosure, I must note that Curt Finch, my doctoral advisor and dissertation committee chairperson was the principal author of the *Case Studies* and the solo author of the *Breakers Simulation*; I, too, was tangentially involved in the final phases of the *Leadership Case Studies*, albeit as a contracting research consultant and not as a graduate research assistant or Center staff member, roles that I later assumed. These involvements compelled me to astutely guard against anything that could possibly be construed as a bias or slant emanating from our respective roles in the products' concurrent development. Hence, I used product synopses taken from the Center's product catalogue (*NCRVE Products*, 1996) rather than writing my own. First, the *Breakers Simulation* was described and displayed as follows (p. 50):

***Breakers: An Organizational Simulation for Vocational Education Professionals***

*C. R. Finch*

This organizational simulation enables participants to assume the roles of administrators and to be responsible for operating Breakers Technical College. Simulation materials consist of guidelines for conducting the simulation. Breakers Technical College orientation materials, and materials for each of the administrators. The simulation can be conducted with an administration or leadership course, workshop, or program.

**MDS-278**

**December, 1992**

**\$33.50**

The *Case Studies* was similarly described and displayed (p. 50):

***Case Studies in Vocational Education Administration: Leadership in Action***

*C. R. Finch, C. E. Reneau, S. L. Faulkner, J. A. Gregson, V. Hernandez-Gantes, G. A. Linkous*

This volume contains fifty-one cases that are based on extensive interviews with vocational education administrators and the instructors who work with them. They are designed for use in courses, seminars, workshops, or any learning environment created to develop leadership skills among practicing vocational education professionals and aspiring leaders.

**MDS-279**

**October, 1992**

**\$15.00**

The MDS numbers were assigned by the Materials Distribution Service at the time of publication. In this study I periodically reference the MDS numbers in lieu of or in addition to product titles. Also, the process by which I chose the specific NCRVE program area to study--and then deduced these specific products as the only two implementable innovations and thereby worthy of focus as the "cases" in this case-study investigation, would have yielded the same two products if undertaken by any other researcher. Moreover, the interviewees selected for in-depth discussions were reasonably well prescribed by the Rogers (1995) dissemination model as clarified below.

*Early Users/Opinion Leaders*

According to Rogers (1995) early users are opinion leaders who help define the rate and extent of subsequent dissemination. I therefore sought such individuals to interview in-depth rather than randomly choosing a representative sample of participants from the social system of targeted users. A random sample would not have reflected the disproportionate impact of early user or non-user opinion leaders. If opinion leaders

influenced other potential adopters, then their positive or negative perceptions of, or their lack of knowledge about the two leadership products, most likely shaped the product dissemination curves (represented by annual units purchased) and may have influenced the magnitude of their peak differences.

Since the 1993 purchase records by name were not maintained--only product totals--I attempted to ferret them out by contacting subsequent purchasers, albeit without success. Moreover, since the annual sales totals revealed that both products peaked in sales during the first year following publication, one could infer then that dissemination began during the developmental stage. I therefore reasoned that the professionals who used these products or were otherwise exposed to them during some phase of the development process, represented many who were opinion leaders. To find such individuals I used paths likely to lead to pockets of opinion leaders in the education-for-work arena: one, electronic inquiries; two, field-test site-inquiries.

*Electronic inquiries.* The first path--electronic inquiries—used internet services, namely, listserv listings and e-mail communications. I asked the Center's Dissemination Director to place an inquiry on Center's Listservs, asking if anyone had used or knew of others who had used either of the two products. One name was secured by this method. After some reflection, I decided to home in on a specific population of easily identified targeted users. The University Council for Vocational Education (UCVE) contained a rich pool of targeted users since its membership consisted of universities with vocational-technical education departments either as separate entities or umbrellaed under other departments with similar missions. Most state-level vocational education departments, I

surmised, worked closely with their respective University VTE departments in matters regarding professional development for vocational-technical and other education administrator-leaders. As such they would influence the scope and design of state-level leadership development programs.

Using the internet, I found the University Council's (UCVE's) Home Page and downloaded its membership roster complete with e-mail addresses. That UCVE member institutions were key influencers at the state-department levels was confirmed by informal phone calls to some state-level education departments who acknowledged that they followed the lead of their respective state universities' education and vocational-technical education departments in matters regarding professional development for vocational-technical and other education leaders. Thus, the higher education graduate programs and graduate school personnel influenced the scope and design of state-level leadership development programs. From the roster I identified all of the names whose key areas of responsibility included terms related to education administration and leadership development. I e-mailed an inquiry to them asking if they were involved in any way with preparing leaders or aspiring leaders in education or the education-for-work arena or knew of others who fit that category. From this inquiry I obtained dozens of responses, most of whom had never heard of NCRVE leadership products, but who should have been cognizant of them by virtue of being a member of the targeted audience. Others were familiar with NCRVE products, but not the two selected for study. Finally, some were familiar with--and had used in varying degrees--one or both of the products (or a derivative thereof).

*Field-testing sites.* The second path for discovering early users of the products involved securing from Curt Finch the sites where the products were field-tested. I reasoned that opinion leaders would have been likely volunteers for field-testing products of interest, since, according to Rogers, early users are the pace setters and their positive or negative opinions influence the rate and extent of later adoption or rejection. This yielded additional interviewees, some whose names I had also found using the e-mail inquiry to UCVE personnel; others whom I contacted by phone.

### Eclectic Research Design Evolves

#### *Quantitative and Qualitative Approaches*

##### *Quantitative*

To answer Research Question #1 a quantitative approach was needed to develop a graph to compare with Rogers' S-shaped diffusion curve. I was compelled to use the number of sales per year from 1993-1996 for each of the two selected products, since the accessible quarterly sales information was incomplete, but the annual totals were available for each of the above years. Next, I input these annual figures into a spreadsheet and generated a graph of the purchases for each product, thereby displaying their respective distribution shapes which was then compared to Rogers' (1995) analogous construct, the S-shaped distribution, evidenced by his numerous confirmatory studies.

##### *Qualitative*

On the other hand, the research design that could best frame an in-depth investigation of Research Questions #2 and #3 appeared to be the case-study approach. Unlike surveys and experiments that separate the unit of study from its real-life context, the case study "investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident . . . " (Yin, 1989, p. 23). According to Yin (1989), single- and multiple-case studies were becoming the paradigm of choice by more and more researchers. He argued persuasively that case studies were analogous to experiments in quantitative designs, with replication logic replacing sampling logic, primarily because sampling logic could not sufficiently take into account rich, contextual factors arising from the phenomenon being examined. Moreover, Lasonen and Finch (1995) affirmed that the case-study method "had a rich history of success in applied research and evaluation . . . [and was] a particularly powerful approach in situations where depth and richness of evaluation information [were] needed"(p. 11). Such was the nature of the contexts in which the two selected NCRVE publications were disseminated for use by state-level and university departments of education for the purpose of developing leaders in vocational-technical education who could effect positive change in the education-for-work arena.

*Education and municipal case-studies.* As additional evidence supporting his thesis, Yin cited research in "school innovations (such as open classrooms, teacher aides, or new technology), . . . each site might be the subject of an individual case study, and the study as a whole would have used a multiple-case design" (p.52). Similarly, the decision-makers who selected the innovations were candidates for use as cases for case-study

research. This was exemplified by Kearns' (1992) investigation of 15 municipal decision-makers. His goal was to ascertain "What frames of reference (assumptions, values, and belief systems) are used by municipal decision makers to guide their assessments of management innovations"(p.45).

*Rogers and the case-study approach.* The argument favoring a case-study paradigm for this research endeavor, crystallized even more firmly when I read and concurred with Kearns' (1992) well-reasoned assertion that survey research designs and the instruments developed to elicit survey data for subsequent quantitative analysis mistakenly "attempted to measure the effects of preselected criteria, based on the *a priori* assumption that these criteria . . . [were] meaningful and relevant to potential adopters" (p.47). As a result, concluded Kearns, constructs defined by the researcher's theoretical template (such as Rogers' attributes of innovations) led the respondents to force-fit their decisions or behaviors into the theory's preconceived frameworks. Spurious findings emanating from such a force-fit were likely, since perceptions, decisions, and behaviors could have been "influenced by a variety of contextual intervening variables that effectively constrain[ed] the explanatory power of the early models of innovative behavior" (p. 47).

Moreover, Kearns believed that pre-defined attributes of innovations or other theoretical constructs used in the Rogers template, failed to consider clusters of assessment criteria that "interact[ed] with each other in a cognitive structure or system to produce an opinion or a decision in the minds of potential adopters" (p.49). As noted in Chapter 2, a further review of the literature yielded added credibility to case-study

research as a legitimate, empirically sound investigative methodology. Seasoned professionals in a variety of fields demonstrated that carefully designed, rigorous case-study research was not only empirically-sound, but was also a richly rewarding adjunct to the traditional array of research tools. (Chidamber & Kon, 1993; Kearns, 1992; Kralewski et al., 1992; Lasonen & Finch, 1995; Maynard-Moody, 1989; Schmidt et al., 1992; Silverman, 1993; Sonnichsen, 1989; Yin, 1989).

### *Innovation as Case*

#### *Limited Studies*

Although case studies in education proliferated (Yin, 1989), most of the case studies testing Rogers' diffusion of innovation theory, used as cases either the site(s) of the innovation or the adopters of the innovation. Few focused on the extent of dissemination, the hierarchies of purchasing organizations, or the characteristics of the innovation being disseminated as factors impacting adoption. Yet Rogers (1995) reported that hundreds of quantitative studies investigating rates of diffusion of innovations in sundry disciplines confirmed his theory that the perceived attributes of innovations substantially impacted their rates of adoption. When synthesized and analyzed, the collection of studies demonstrated that the perceived attributes of innovations explained from 49 to 87 percent of the differences in the extent of diffusion among adopters (Rogers, 1995). This clearly underscored the importance of using the innovation itself as a case in the case-study approach. I therefore decided to undertake such a study in the context of the two selected leadership products disseminated by the National Center for Research in Vocational Education, University of California,



Berkeley. The challenge was intellectually rigorous and rewarding, and the findings contributed new knowledge to the research-base of education innovation.

### *Dual Focus Needed*

Chidamber and Kon (1993) explained an innovation-focused case study as "a systematic record of a specific innovation. Data is mainly qualitative and obtained through interviews, public records and archival data . . . [in order ] to present a more vivid picture of the innovation over a longer time horizon . . . providing rich details of the underlying process that is being observed" (p.8). A major drawback of this and other similar studies was the propensity to focus on more successful innovations rather less successful ones (Chidamber & Kon, 1993; Rogers, 1995; Yin, 1989). The two products selected for my study represent a wide disparity in number of purchasers, implying that one product disseminated more broadly than the other. By studying both products, I avoided the drawback of focusing only on the more popular innovation.

### *Deciding How Many Products to Use*

In deciding the number of cases to examine, Yin (1989) advised researchers to use more cases if external conditions caused wide variations in the phenomenon under study and fewer cases if external conditions caused few variations. The vast disparity between the two products' diffusion outcomes were not primarily explained by the external environment, since each publication confronted similar diffusion paths in the same overall climate. *Both items were published during the same quarter; disseminated by the*

*same organization, targeted to the same audience; and designed for the same objective--developing high performing leaders in education-for-work arena.*

Explaining the underlying logic of multiple-case use, Yin (1989) observed that, "Each case must be carefully selected so that it either (a) predicts similar results (a *literal replication*) or (b) produces contrary results but for predictable reasons (a *theoretical replication*)" (p.53). Through this research, I elicited reasons for the contrary sales results of the two products. Moreover, the results as described in Chapter 4 tend to support the notion that the contrary results occurred for predictable reasons, one of which was rooted in purchasers' perceptions of the attributes of the respective products. Finally, understanding the factors that underlie these disparate dissemination results will be invaluable for persons charged with optimizing future product-dissemination strategies.

## Instrumentation and Information Collection

### *Semi-Structured Telephone Interviews*

To generate the needed information from the participants I used a semi-structured telephone interview technique like the in-person technique used by Finch et al. (1991) in their effort to identify patterns and themes associated with successful vocational-technical education leaders. Similarly, Schmidt et al. (1992) investigated teacher roles in integrating vocational and academic education using the same basic interview structure. Since this investigation was unfunded and undertaken solo rather than as part of a team, the travel costs and time that would have been involved with in-person interviews precluded my using on-site interviews for this study. The semi-structured telephone

interview is, however, superior to written surveys when the number of participants is manageably small; it allows the interviewer to probe for clarification and has greater overall flexibility in the data gathering process (Kerlinger, 1986; Schmidt et al., 1992).

### *Open and Closed Questions*

Using both open and closed questions, I harnessed the strengths of structured as well as non-structured techniques by designing a semi-structured telephone interview protocol. The design protocol elicited from the interviewees (a) opinions concerning the generic attributes of the two products, (b) what factors led to selection decisions, (c) how the products had been used, and (d) with what outcomes. Similar to McClelland's Behavioral Event Interview as described by Schmidt et al. (1992), the decision to use a product was analogous to a critical incident and could "be explored until behaviors, thoughts, and feelings [were] adequately reported" (p.9). The authors pointed out further that "The BEI had a successful history of use in a variety of settings, including business, industry, education, and the military" (p. 9).

### *Practice and Refinement*

Prior to full-scale execution of the interview protocol, I was trained and coached by Curt Finch, a seasoned practitioner of the semi-structured, behavioral event interview technique. We both reviewed my practice taped-interviews independently and proffered our respective suggestions and modifications. In practicing the original instruments, I had found areas that were too cumbersome and wordy and sometimes appeared awkwardly redundant. Thus, I reduced and clarified accordingly. Because I had received

so many e-mail responses from targeted university practitioners who were not familiar with NCRVE's leadership products, I segmented the final two-page questionnaire into one component of 12 questions, generic in nature, and a second component of three questions about the leadership products in particular, including one levels-of-use form and one behavioral-event form as attachments. The refined instrument, approved by Curt Finch, is shown in *Appendix A*.

#### *Interviewing Protocol and Follow-Up Tasks*

When I contacted the potential interviewees by phone to secure permission for a taped interview, I apprised them of the importance of the information needed. In addition, I explained that I would fax the questions to them a day or two in advance, allowing them more time to objectively recollect the facts and to subjectively reflect on their impressions, opinions, and behaviors relative to the products being studied. A sample of the cover letters that accompanied the faxed questionnaires is also displayed in *Appendix A*. The cover letters thanked the interviewees for allowing me to tape-record our 20-40 minute conversations and assured them of confidentiality. None of the interviewees expressed any hesitation about allowing the taped interviews. On the contrary, they enthusiastically agreed to assist as needed in the investigation.

#### *Transcribing and Sorting Responses*

Using the modified semi-structured telephone interview instrument described above and included in *Appendix A*, I conducted tape-recorded interviews with 15 members of the targeted pool of users--14 leadership development professionals in higher education and one state-level coordinator. Following each taped interview, I transcribed

the tapes--usually within 24 hours. After completing several transcriptions, I grouped together all responses to each designated question, sorting them by item number and adding to each sorted group, the remaining responses as they were transcribed. From the accruing sets of sorted responses, I teased out embedded fragments of dissimilar and similar ideas, recurring phrases, and memorable recollections. This process amassed thematic clusters loosely woven together by numerous threads which I subsequently traced and analyzed.

To insure accuracy and authenticity, I asked a graduate student in vocational education whom I did not know personally, but who was very experienced in conducting semi-structured research interviews to listen to a random selection of three tapes and verify the accuracy of the six interviews transcribed from the three tapes. The student's signed verification appears as *Appendix B*.

#### *Categorizing and Coding Participant Levels-of-Awareness and Use*

In addition to transcribing the 15 taped interviews, I also coded them on a continuum ranging from non-cognizant to using both products. Thirteen participants represented varying levels of awareness and use of NCRVE leadership products and two represented those in the targeted group who had never heard of NCRVE leadership products. Below is the listing of nine levels of awareness-and-use discerned among the 15 participants and coded accordingly:

*Level I-NC.* Two of the 15 were not aware of NCRVE's leadership products, even though their respective universities were UCVE members. I coded them as Level I-NC for non-cognizant.

*Level II-SC-NO-NU.* Another interviewee was slightly cognizant of NCRVE leadership products, but felt he wasn't as aware as he should have been. Therefore he had not used any of the products and had formed no opinion about them, although he hoped to learn more about these products in the future. I coded him as Level II-SC-NO-NU for slightly cognizant, no opinion, not used. He was the only one in that group.

*Level III-C-UO-NU.* Level III likewise consisted of one person who was fully cognizant of NCRVE's leadership products' research and development phase, but had not chosen to use any of the final products because of an overall unfavorable opinion he had formed of them. He was thus coded Level III-C-UO-NU for cognizant, unfavorable opinion, not used.

*Level IV-CR-FO-NU.* Level IV was also only one person--a fully cognizant professional who had been involved in developing the leadership instruments and early leadership research reports and had subsequently reviewed segments of some of the leadership materials as they were being finalized. The interviewee had not used the final products but expressed a favorable opinion of them; and, accordingly, was coded Level IV-CR-FO-NU for cognizant reviewer, favorable opinion, not used.

*Level V-CS-FO-UM.* Another interviewee was cognizant of some NCRVE leadership products and expressed a highly favorable opinion of them. Although she did not use either the *Cases* or the *Simulation* per se, she had used another (miscellaneous) product in which some of the case studies were included. She comprised the sole member of Level V, coded accordingly as V-CS-FO-UM (cognizant of some, favorable opinion, used miscellaneous).

*Level VI-C-FO-UC.* Level VI consisted of four interviewees who used the *Cases* but did not use the *Simulation*. Two were field-testers; a third was on the NCRVE mailing list and had a whole shelf of products displayed in the department head's office. Such awareness led to his selecting the *Case Studies* for use with his classes. The fourth interviewee had heard about the product as an NCRVE staff member. All expressed favorable opinions of the *Cases* and were coded accordingly as VI-C-FO-UC (group VI, cognizant, favorable opinion, used cases).

*Level VII-C-FO-US.* Level VII consisted of two individuals who had used the *Simulation* but not the *Cases*. Both were field-testers who recorded favorable opinions. I coded them accordingly as VII-C-FO-US (Level VII, cognizant, favorable opinion, used simulation).

*Level VIII-C-CO-UCS* and *Level IX-C-CO-UCS1*. Three interviewees had used both the *Cases* and the *Simulation* and reported favorable opinions of both. However, since one of the three had used a comprehensive program, marketed more recently by NCRVE, that included the *Cases* and the *Simulation* as bundled components, I listed him separately. Thus the two in Level VIII were coded as being cognizant of the products, with comparative opinions of the two products, and uusers of both the cases and the simulation (VIII-C-CO-UCS). Level IX, the last interviewee, was coded the same except for the addition of a "1" at the end (IX-C-CO-UCS1) since the two products were bundled into one comprehensive program. Some of the interviewees who were users of one or both of the two selected leadership products were also users of one or more additional NCRVE products.

In brief, the continuum consisted of levels of awareness and use ranging from totally unaware of the National Center's leadership products to users of both the *Cases* and the *Simulation* one or more times. I then collected and collated by item number the transcribed responses to each question. By carefully collating the generic and product-specific questionnaire responses by item number and by coding participant awareness and use levels, I uncovered trends and themes, similarities and dissimilarities--most of which could be contextualized and framed in one or more analogues on the Rogers (1995) model. This intellectual exercise and the findings that unfolded therein, culminated in Chapter 4--Results.

#### Chapter Summary

In Chapter 3, the rationale for the research methodology was shown as a natural winnowing down and refinement of the investigative scope of this study. The result was further delimitation of the parameters of the three research questions posited in Chapter 1. Then explanations were presented of how the delimited research parameters instructed (a) the selection of products and participants, (b) the use of a hybrid quantitative and qualitative research design, (c) the specific choice of the case-study approach for this investigation, and (d) the design and use of the semi-structured interview instrument to gather the information needed. Included in the latter were discussions of why and how the transcribed responses were sorted and why the interviewees were coded according to levels of awareness and use--processes which facilitated uncovering the results (Chapter 4) and analyzing the findings and implications (Chapter 5).





## Chapter 4

### RESULTS

#### Introduction

In the previous chapter I explained how delimited parameters shaped the research methodology and investigative scope of this study, causing me to further refine (a) the questions and strategies for explicating them, (b) product and participant selection procedures, and (c) the telephone interview instrument designed for collecting the requisite information. In this chapter I describe the findings thusly obtained from the information base that encompassed (a) quantitative sales data and other NCRVE support materials, and (b) qualitative responses to questions on a semi-structured telephone interview instrument--the nature and purpose of which I fully explored in Chapter 3. Moreover, I show how the findings gradually unfolded as I (a) tabulated and charted the sales data and (b) assembled the variegated patches of thematic and explicatory information extracted from the sorted responses to the questionnaire items.

#### Quantitative Findings Explicate Research Question #1

##### *The Sigmoidal Construct*

Having synthesized hundreds of research studies about diffusion-of-innovations into designated social systems of potential adopters, Rogers (1995) noted that differences existed between members who formed opinions early and those who formed opinions

later. Based on findings from these studies, he generalized that diffused innovations (innovations adopted in whole or in part by most members of the targeted social system) tended to be normally distributed, and that the rate of adoption generally conformed to the first half of that bell-shaped curve which is a sigmoidal S-shape (Rogers, 1995).

From this, I formulated Research Question #1:

***Research Question #1:** To what extent did unit sales figures for implementable leadership products published in the fourth quarter of 1992 follow the sigmoidal (S-shaped) distribution as predicated by Rogers?*

*Depicting Spreadsheet Data*

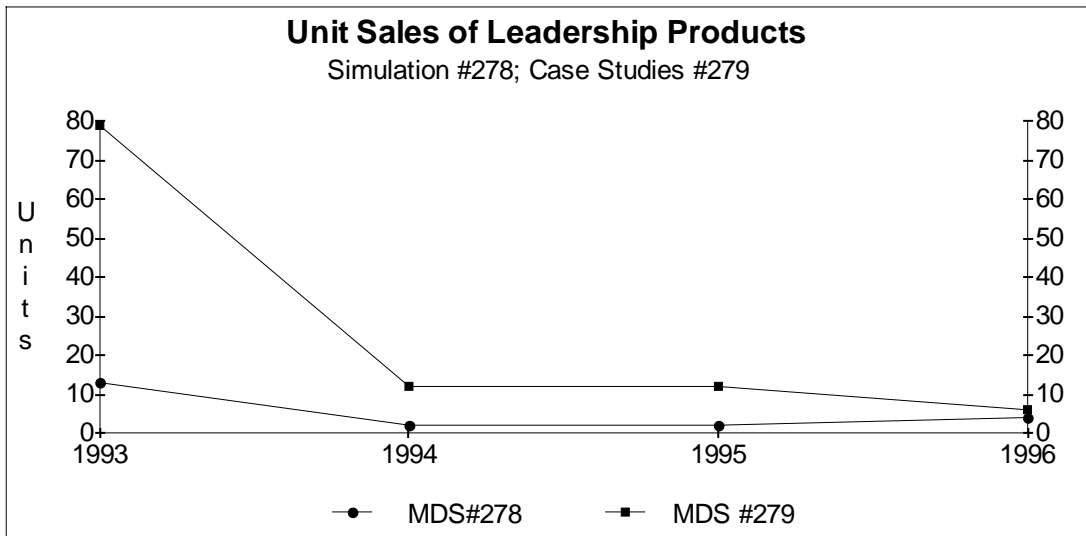
Using the only quantitative information available about purchases of the two products-the number of sales per year from 1993-1996-I created a spreadsheet and generated graphics of the annual purchase numbers for each product. The graphics displayed the products' respective distribution curves and comparative total units per year sold. The spreadsheet data as tabulated are shown in Table 1.

**Table 1. Unit Sales--Spreadsheet Data**

Unit Sales by Year						
MDS #	Product & Year Published	1993	1994	1995	1996	Total
278	Leadership Simulation 1992	13	2	2	4	21
279	Leadership Case Studies 1992	79	12	12	6	109

To facilitate conceptualizing a sigmoidal distribution construct, I suggest first envisioning

the prototypical 'bell curve,' then picturing just the left side of the bell curve with only the top line visible. That line looks like a somewhat stretched-out and slanted letter S--the shape of the *sigmoidal curve*--the pattern displayed by most fully disseminated innovations as Rogers (1995) confirmed. Hence, the *S-curve*, thusly envisioned, is the pattern against which I compared a line-graph of the distribution curves for each product. *Figure 1* displays the line-graph generated from the sales input data. As noted in Chapter 3, the lines generally conformed to the second half of a bell-curve--an inverse-conformity with the hypothesized sigmoidal or *S-distribution* shape. Moreover, since the pattern was an inverse sigmoidal shape, rather than non-existent or patternless as disconfirming studies would have depicted, I surmised that the unusual inverse conformity had meaning, albeit enigmatic. Additionally, a bar-chart generated from the same tabulated sales data, underscored a related finding. Shown as *Figure 2*, the contrasting bars highlight the respective products' disparity in total units sold. The chart shows that at the peak sales year, more units of the *Cases* (#279) were purchased than units of the *Simulation* (#278) by a 6:1 ratio during the first three years and a 1.5:1 ratio during the fourth year. Why did the *Cases* consistently disseminate so much more broadly than the *Simulation*? The qualitative information gathered from all participants illuminated further the nature of the enigmatic quantitative findings, while explicating the remaining research questions.



**Figure 1. Line-Graph of Annual Unit Sales**

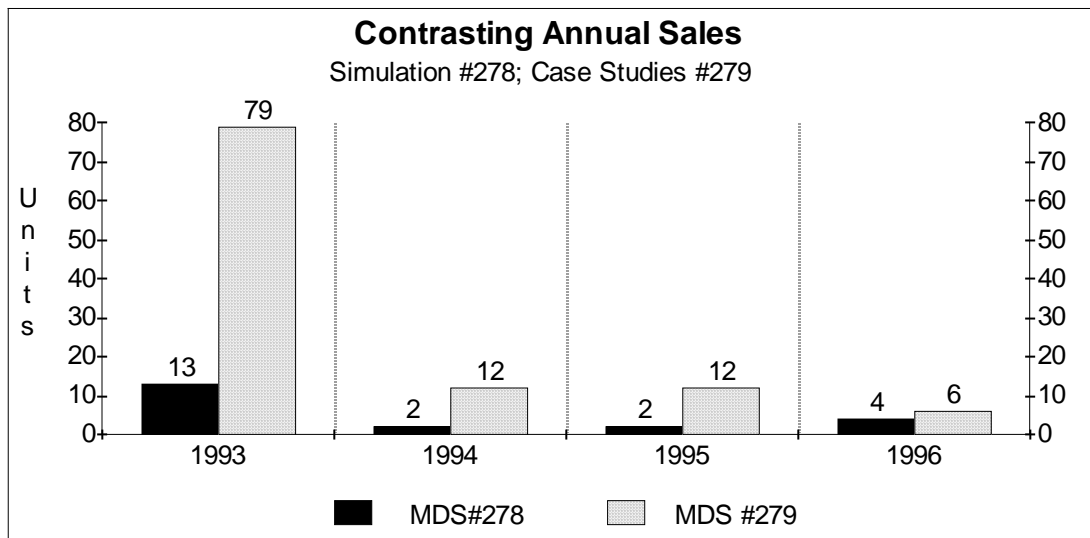


Figure 2. Bar-Chart Contrasts Differences

## Qualitative Information--Informs All Research Questions

### *Nature of the Respondent Pool*

As explained in Chapter 3, I identified from the University Council for Vocational Education (UCVE) all persons whose key areas of responsibility included terms related to educational leadership and e-mailed them accordingly. Were they involved, I asked, in any way with preparing leaders or aspiring leaders in education or the education-for-work arena or did they know of others who fit that category? Because many who responded as "fitting" the category described above had not heard of NCRVE's leadership products, I wondered why this was so, and therefore selected two such respondents to interview in addition to others whose familiarity and involvement with the products varied.

Although many persons in the non-cognizant pool of targeted users agreed to be interviewed, I followed the guidelines of Ely et al. (1993) in ascertaining when I had conducted sufficient interviews. The authors suggested several criteria. First, "the researcher should know that he or she can talk for the participants—as the participants—in a legitimate way" (p.91). Second, "if there are too many unanswered questions pertaining to the questions asked [via the interview protocol](p. 91)" then more interviews would be needed. Third, they cite Lincoln and Guba (1985) who "tell us that when data repeat themselves, when the researcher has confidence that themes and examples are repeating instead of extending" (Ely et al., 1993, p.92) then the researcher has likely collected sufficient information. Based on those criteria I had accrued sufficient information by the time I had interviewed 13 individuals who were familiar with NCRVE leadership products and two who had never heard of the products. Of the

13 interviewees who were familiar with NCRVE products, some were nevertheless not familiar with one or both of the two products selected for this research. Others, including field-testers, were familiar with and had used in varying degrees one or both of these products.

### *The Telephone Interview Instrument—Information Collected*

#### *Levels of Involvement*

The 15 target-market opinion leaders selected for in-depth interviews represented a complete range of NCRVE product-awareness and involvement levels. I discerned nine such levels and coded them as indicated in Chapter 3. Of the 15 interviewees, two had never heard of NCRVE's leadership products; one was slightly aware, but not enough to voice an opinion and eager to learn more; the remaining 12 were familiar with NCRVE leadership products and had formed opinions--all of which were favorable except one. Ten of the 12 were users of one or more of the leadership products; none of the 10 actual product-users had unfavorable opinions. Finally, nine of the 10 users had used one or both of the selected products one or more times.

#### *Nature of the Questions*

To gather information I used the two-part questionnaire described in Chapter 3. Part 1 consisted of 12 items formulated to gather generic information from all 15 interviewees regarding (a) their methods of learning about and selecting innovative leadership materials; (b) their assessments about work-related or institutional factors which tended to facilitate or impede positive, innovative changes; and (c) their ideas and suggestions for designing and disseminating such materials for optimal benefit. Part 2



consisted of three product-specific questions directed to the 13 interviewees who were aware of NCRVE leadership products. Part 2 questions pertained to the participants' extent of awareness and use of NCRVE leadership products and their perceptions about and experiences with the two products selected for this study.

Through in-depth taped telephone interviews 20-40 minutes long, I elicited opinions and recollections of behavioral events from users of the products, in addition to generic information about leadership products solicited from all 15 of the interviewees. Because of the semi-structured design of the instrument, valuable information emerged that explicated Research Questions #2 and #3 and helped contextualize all three research questions in the appropriate Rogers (1995) analogues. The previously described unusual finding of an inverse sigmoidal shape in Research Question #1--relative to the distribution curve for purchases of products #278 and #279--led to modifying Research Question #2 accordingly, to substitute early users for purchasers:

***Research Question #2:** To what extent were the early users of the products also members of institutions that facilitated innovation and autonomy in decisions related to new product purchases?*

As discussed in Chapter 3, Rogers (1995) found that bureaucratic and autocratic work climates tended to stymie innovation and any "outside-the-box" thinking. On the other hand, flatter management structures, characterized by team management and pushing decision-making to the level most likely to be affected by the decisions, tended to facilitate innovation. Individuals associated with institutions thusly managed were likely to be among the first to try out new ideas and to embrace positive change.

### *Organization Climates and Participant Autonomy Among Interviewees*

I wanted to find out from the individuals I interviewed how much autonomy they had in selecting new products to use in preparing leaders for the future. In addition, I solicited their opinions regarding what management or work climate factors could inhibit or enhance new product use. I chose to ask the question hypothetically rather than specific to their own organizations, since most would be reluctant to criticize their own organization's management to a stranger, even if justified. Four items on the telephone interview instrument were formulated to investigate the perceptions of participants regarding factors they associated with facilitative and inhibitive management climates-- both hypothetical and real. They are listed below with their synthesized results.

#### *Management Climates--Speculations Generated*

*Items 6 and 7.* I asked interviewees to describe management climates that they felt tended to facilitate (item 6) or impede (item 7) timely and effective dissemination and use of important innovative leadership materials. All indicated that their respective organizations were open and encouraged innovation. Those affiliated with universities said that the professors decided what materials to use for their respective classes. One state-level professional indicated that she had opened up communication lines and had begun disseminating information about innovations to the sundry lower-level educational units statewide, insuring that those who could use the information would have access to it. Her predecessor, on the other hand, had made all decisions about relevance of materials and about what should be disseminated and who should use it.

The following were among the insightful comments proffered regarding work climates that would facilitate or impede dissemination and use of innovative products:

*Impede.*

1. . . . Some institutions have been teaching the same things and have had the staff doing the same things for years and years; innovativeness isn't just changing staff, but how the staff and faculty utilize current technology in their instruction, in their presentation of materials, how they are involved with getting grants and contracts; trying to transfer their research to the real world. . . [also], 'inbreeding' [results in] the same people and their students coming back and no new ideas coming in . . . staying in the box institutionally, not embracing new and different ways of doing things that could be better, feeling too comfortable and unwilling to look at new ways of doing things, such as using the internet.
2. If a center of the wheel goes on a sabbatical or leave and it takes a long time to fill the position, we would have to reconstruct communication lines since most of the information passes through them. That would be tough.
3. Occasionally, there may be some who feel threatened territorially [in interdisciplinary collaborative efforts].
4. If faculty didn't have access to e-mail and listservs and if they were not on mailing lists, then they would have problems.
5. If professors are not given freedom and time to review and use materials.
6. . . . One impeding factor is when you start using the same referents time after time after time; that's a problem in vocational education right now. We are in sad shape for leadership at the national level. I think we have really got some problems. . . rely too much on printed materials and AVA. At AVA . . . the same people are saying the same things year after year and they haven't changed their experiences; but because they are there, they are settled; they are forced into writing because of publish or perish; they'll write on things they have never been involved with; and limited visions get represented as experts.
7. An environment that is heavy-handed, having to justify everything from a cost perspective discourages people; they lose initiative to plan ahead, to be creative and to experiment.
8. Changing departments; newsletters like *Centerwork* don't follow.

9. One may be dissuaded from doing some things based on what the Chancellor is trying to do which may be--not in conflict--but moving the university in another direction from what I'm trying to accomplish. So external factors [may impede].

10. Curriculum committees can sometimes impede.

*Facilitate.*

1. Open, broad, direct communication and a feeling of ownership and responsibility; attitudes and an atmosphere of sharing, of role modeling, of mentoring.

2. We have some multi-disciplinary committees, and our teacher and learning center has topical discussions and presentations related to leadership; then there is also a faculty Friday Club, a kind of social gathering; you can just kind of have some nice intellectual discussions; then we also have a teaching community within our college that meets once a month on Friday for a couple of hours--and that's nice to talk about multi-disciplinary teaching and issues that we deal with.

3. Open environment where communication is encouraged and occasional failure is considered a by-product of stretching one's abilities--that kind of environment would help promote innovation.

4. Our Facts Center is always having workshops and notifying us about new materials; more information than we can take advantage of.

5. Management policies have to be formulated around team building and organizational change--both in response to some kind of mission. And the procedures would have to be things like a lot of staff development to make sure everybody understands and contributes to delineating the mission and then figuring out how the teams can all contribute to the mission some way.

6. . . . If we believe in the new leadership paradigm of using teams and allowing decisions to be made from the bottom and rising to the top, then we have to believe that people who are teaching leadership or who are hired to work in the leadership arena have the skills and abilities to make those decisions.

*Management Climate--Impediments Encountered.*

*Item 9.* Here I asked the interviewees to name any impediments they had ever encountered that had hampered their ability to learn about, evaluate, and adopt innovative

leadership materials. Insufficient time and money were the most frequently mentioned impediments. Time was singularly cited by three persons; money, by four; both time *and* money were cited by one interviewee. Their comments follow:

*Time.*

1. Just limited time.
2. The only real impediment I find is time. There just isn't enough time to even look at the marketing materials effectively when they come across my desk.
3. I think the basic thing is time. We're getting into an information overload. We have to have some time to check things out and some time to do some evaluation.

*Money.*

1. Nothing has hampered my ability to learn about materials, but to evaluate and adopt is cost.
2. Only money. For example, Kouzes and Posner have a video based on The Leadership Challenge--it costs \$850 for a twenty minute video; you just can't afford to buy that, even though it's a wonderful tape. So we try to share information; go in with other departments and share costs and materials. And on the \$850 one I put in a request to our library for next year, and we showed that other people on campus would use it.
3. Probably the lack of funding to support development--you know, that would allow me to participate in what are some pretty hefty price tags for leadership training or focusing on new theory development or something like that.
4. The key barrier is money restrictions which prevent extensive travel or communications and thus hamper the information exchange. Red tape and money restrictions can squelch creativity.

*Time and money.*

1. Time and money; finding the time to seek out and evaluate these materials is a real challenge; we are always being asked to do more in less time, so time is a precious commodity. [Then] cost can be a real factor. For example, some of the supplementary materials, like the video tapes and exercise kits, and so on that were recommended with NCRVE's program are really very expensive. Kind of

difficult to fit into the budget of a public institution--\$700-\$800. Even some of the rentals like for a 3-day rental were \$500 or so. That's a lot of money. Several participants pointed to other factors as indicated below:

*Other impediments.*

1. I am not politically astute . . . I assume people are direct because that is the way I work; [but] everybody has an agenda; I just make mine public. This has hampered me at times in making decisions.
2. The biggest impediment [in the past] was people in administrative or leadership positions who were not open to change, [even though] the world was changing around them.
3. The only impediment I have is my own procrastination.

*No impediments.* Finally, four of the interviewees reported having personally encountered *no* impediments in learning about and using new materials.

*Levels of Approval Involved in Purchases.*

*Item 11.* I placed this question on the interview instrument to help elucidate the extent of an interviewee's autonomy or lack of autonomy and any impeding hierarchical structures. It asked the interviewees to describe the purchase-order approval process that they had to follow to secure the materials they wanted. All fourteen interviewees indicated that they selected the materials with approvals required by the department head or the business office or no one; none of the interviewees' purchase orders were questioned, except for unusually expensive items or items that duplicated something already purchased. Most also indicated that normal or expedited processing were options, allowing faster turn-around if the purchase orders were "walked-through."

Delays due to bureaucratic red tape or budgetary constraints were non-existent. Among the comments indicating quick approvals and fast turn-around times were

statements such as these: "I call the secretary today with all the information, that's it"; "We have an excellent accountant. He'll turn over the paperwork in a day"; "If you walk them through, they go right on through."; "Two or three days to purchase order approved if everybody is here"; "usually a couple of days, but you can carry it through in a day"; "Through normal channels, four to five days; one day expedited is possible if I really need it."

*Exceptions clarified.* Even the one person who indicated that at least five approvals were required estimated that it took only two days at the most to get those approvals. Another indicated that while students had to purchase individual textbooks from the University bookstore, the department's staff ordered their own instructional materials through the department and there was no budgetary limit imposed, "perhaps because we don't buy a lot; we generate much of our own since we have people who are really strong in multimedia programs." Only one person mentioned politics as a delaying factor: "If the legislature is in an uproar it may take a month--if not, a day." Only one person estimated that it took as long as 30 days routinely to process an order for materials--even though he had autonomy in what to order, he had to go through the one person who was solely responsible for writing up purchase orders. Finally, the one interviewee who was a state-wide professional development director described a somewhat more complicated process that included being required to go through the state's Central Purchasing. Even so she had ordered 125 books on Monday and had received them on Wednesday of the same week. But if items were over certain costs internal bidding was required. In short all 15 of interviewees worked for organizations depicted

as facilitating innovation and autonomy among the practitioners. Some had incurred impediments in the past issuing primarily from time and budgetary constraints that they felt were not institution-specific but prevalent throughout the post-secondary education system. In their current positions some had self-imposed time or money constraints but all were free to seek out and use innovative leadership materials as they deemed appropriate. Overall, the results indicated that users and non-users of the leadership products were affiliated with institutions that facilitated innovation as theorized by Rogers (1995).

#### *Product Attributes and Dissemination*

If innovative leadership products were continually being sought by autonomous leadership development professionals at UCVE member institutions, why had many such professionals never heard of NCRVE leadership products? Also, why had others who were cognizant of the products, chosen not to use them? I surmised that plausible answers to these questions were embedded in the *attributes-of-innovation* construct and teased them out in the process of unraveling Research Question #3:

***Research Question #3:*** *Research Question #3: Were the perceived attributes of selected National Center products comparable to their generic analogues in the Rogers model, and did they function similarly in terms of influencing the extent of dissemination among targeted users?*

I wanted to find out if attributes of the two selected products, as perceived by users of the products, were analogous to the generic attributes of innovations described in the Rogers model. Moreover, I wondered if the *Cases'* and *Simulation's* respective attributes, when



compared, could have explained in part, why the two products had the same inverse S-shaped distribution curve, but widely disparate purchase numbers for each year marked on the curve. If the National Center's researchers better understood the attributes associated with the products they disseminated and how those attributes related to the extent of dissemination, they could incorporate this information in future product development and dissemination strategies to maximize the positive impact.

#### *Rogers' Attributes Re-framed in the Context of Information Collected*

Rogers (1995) found that five generic attributes were measurable across a variety of disciplines and categories of innovations: *relative advantage, compatibility, complexity, observability, and trialability*. These were described in Chapter 1 and have been re-framed in this chapter as needed in the context of examining the attributes of NCRVE's *Leadership Case Studies* and *Breakers Leadership Simulation*. By using open-ended questions and by not mentioning Rogers' theory or any of his generic attributes by name during the interview process, I eliminated the possibility that I could prejudice the responses toward conformity with the theory. Instead, I accepted the resultant challenge of grouping together answers that were thematically related and then slotting the attribute-sets into their appropriate analogues from the Rogers template.

#### *Generic Instrument Items Elicit Attributes*

*Items 2(b) and 4--expected features for new product consideration.* Several items on the telephone interview instrument were formulated to elicit attributes that the interviewees felt were important in innovative leadership products, generically speaking. *Item 2(b)* asked the interviewees to name the key criteria which they would use in ranking

the value of competing products; *item 4* asked them to name three or more important features they expected to be a part of any new materials they were considering using. Since *item 2(b)* and *item 4* were not mutually exclusive and often overlapped, I combined them in the final compilation and analyzed the results in tandem. *Appendix C*, titled *Interviewees' Desired Attributes* shows each interviewee's desired-attribute phrases. When phrases denoted similar themes I assigned them the same small-cap letter in parentheses. Next, I grouped together the phrases with the same themes as designated by the small letter. This resulted in *Appendix D, Thematic Sets of Desired Attributes Named by Interviewees*, and shows 17 thematic sets of desired attributes, collated and alphabetized from the combined individual responses displayed in *Appendix C*. Each thematic set contains the approximate phrases used by the respective interviewees represented in that set by their previously defined codes. The starred items indicate what the interviewees felt were the most important features.

*Item 5--Objectionable features--cause to reject.* *Item 5* asked the interviewees to name any objectionable feature that would prompt them to reject or not recommend a product even if the product had the previously stated required features. In *Appendix E, Reasons for Rejecting a Product*, I similarly compiled and listed alphabetically the interviewees' reasons for rejecting a product. When someone cited as a reason for rejection, the product's *not* possessing a feature that had been named as required or highly desirable in the previous question, I listed the reason-for-rejection feature by the same letter as the required-counterpart feature in *Appendix D*, and preceded it with a *minus* (-) sign.

### *Overview of Themes Pegged to Analogues*

*Compatibility/Relative advantage embedded in all response-set themes.* One or more of the desired- or critical-attributes listed in each of the 17 theme-sets was explicitly embedded in some dimension of Rogers' *compatibility* attribute, and implicitly imbedded in the *relative advantage* attribute. Moreover, I synthesized the findings from *Appendixes D* and *E* and displayed them in a composite table *Appendix F*. The word-table depicts for each lettered set of responses a single condensed descriptive theme-phrase with the same identifying lower-case letter in parentheses that designated the theme-set in *Appendixes D* and *E*. Column 1 of the chart lists alphabetically the 17 themes thusly obtained. Column 2 lists the number of responses in each theme set (from *Appendix D*). If an interviewee's reason for rejecting an innovation (*Appendix E*) was the fact that the product did not have a specific attribute that had been listed as a desired attribute in *Appendix D*, the undesirable quality was identified with the same theme letter preceded by a negative sign. Some interviewees would list a characteristic such as "reasonable cost" as a desired attribute and then list "unreasonable cost" as a reason for rejection. Such duplicated responses from single interviewees were not included in the numbers tallied for Column 3 of *Appendix F*. For example, "unreasonable cost" as a reason for rejection was only tabulated for column 3 if the interviewee who cited it as a reason for rejection had not previously cited it as a desired attribute. Columns 4-7 list the referent analogues applicable to each of the 17 thematic response-sets.

*Compatibility themes explicit.* Rogers (1995) defined compatibility as the "degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of the potential adopters" (p. 224). The largest set of desired-attribute items shown in *Appendix F* consisted of 11 responses centered around the theme of audience- and user- appropriate materials--congruent with values, needs, and experience. The items so identified with (*b*'s) in the alphabetical listing (*Appendix D*) were grouped together as set (*b*) in *Appendix F*. Ten of the responses were from interviewees who were familiar with NCRVE leadership products; seven of those 10 were from interviewees who had used one or both of the two selected products--*Cases* and *Simulation*. Moreover, the two remaining selected product users who had not identified a similar audience- and user- appropriate theme as a requirement for innovations under their consideration, had nevertheless identified the lack of such an attribute (*-b* items, *Appendix E*) as a reason for rejecting an innovation.

*Desired-attribute sets (a) and (f).* These conveyed the theme of applying principle-based theory to real-life problems and situations and aligned with values and experience. Sets (*a*) and (*f*) had five responses each, indicating the desire for new products to show how research and principle-based theory is applied--as practical ideas being brought to bear on real life situations or problems. These groups, also exhibited in *Appendix D*, similarly issue from Rogers' *compatibility* dimensions. One (*-a*) in *Appendix E* showed an additional person who felt that overemphasis on theory would be a cause for rejection.

*Other theme-sets.* The theme of the five desired-attribute responses that comprised set (*k*) centered around materials being easy or not too difficult to use--a theme that issued from values, needs and experience dimensions of *compatibility*. Six desired-attribute responses related to the theme of reasonably priced materials--for the students or the departments. Grouped as set (*l*), they issued from values and needs dimensions of *compatibility*. Two who did not list reasonable cost as a required feature, nevertheless, listed unreasonable cost as a reason for rejection (*-l's*) in *Appendix E*, bringing to eight, the number of interviewees who attached importance to the cost factor.

Desired-attribute set (*c*) theme--up-to-date, current content--aligns with experience and values dimensions of *compatibility*. Four (*c*) responses on the desired-attribute question, and one (*-c*) response by a different interviewee on the rejection-feature question meant that five interviewees believed it was important to have up-to-date, current content. Experience primarily enabled them to discern out-of-date or inaccurate data or terminology and to value materials that were current. Other desired-attribute sets and their respective themes also aligned with one or more of the *compatibility* dimensions. The only (*d*) response indicated that the availability of a trial copy was a highly desirable feature--(experience and need dimensions). Four (*g's*) expected information from previous users and evidence of successful outcomes (experience and need dimensions). Three (*i's*) expected that new products would have been successfully field-tested; and one (*m*) expected plentiful support materials to be available (experience and need dimensions).

*Product name as desired-attribute factor.* Finally, one reason for rejection dovetailed with a special attribute factor that Rogers tied to several others, including the values and experience dimensions of compatibility. That important but often overlooked factor is the name of an innovation. Rogers (1995) expounded as follows on the importance of an innovation's name:

. . . Inadequate attention has been paid to what innovations are called by potential adopters, and as a result serious mistakes have been made. . . errors have shown commercial companies the importance of market research to pretest the name for a new product prior to its release. . .

The perception of an innovation is colored by the word symbols used for it. The selection of an innovation's name is a delicate and important matter. Words are the thought-units that structure perceptions. And of course it is the potential adopter's perceptions of an innovation that affect its rate of adoption (p.236).

One (s) response from an interviewee in *Appendix E* indicated that the individual would reject an innovation if "the title doesn't show me something." Rogers (1995) believed that non-profit organizations should learn from the marketing masters how to test different names for new products prior to finalizing diffusion strategies. Moreover, he urged public-sector, non-profit change agencies like NCRVE to adopt "a receiver-oriented, empirical approach to naming an innovation . . ." (p.237). Since the phrase "vocational education" has acquired some negative connotations over the years, one could argue that such negative perceptions may have impeded the breadth of dissemination of many NCRVE products, including the two selected for this study, since both have the term "vocational education" in their unabridged titles. This would be a worthy investigative challenge for the future.

### *Relative Advantage Analogue*

*Construct illustrated.* Rogers (1995) defined *relative advantage* as "the degree to which an innovation is perceived as being better than" (p.212) a competing or preceding idea. He elaborated as follows:

. . . diffusion of an innovation is an uncertainty-reduction process. When individuals (or an organization) pass through the innovation-decision process, they are motivated to seek information to decrease uncertainty about the relative advantage of an innovation. Potential adopters want to know the degree to which a new idea is better than an existing practice. So relative advantage is often an important part of message content about an innovation. The exchange of such innovation-evaluation information lies at the heart of the diffusion process (p.216).

*Generic responses analyzed.* While the interviewees did not isolate specific features that could be grouped under the category of a *relative advantage* attribute, they nevertheless discussed all of their required or desired features in terms of the extent to which those features were more prominent in a given product compared to a previous product, the lack of a product, a currently used product, or a competing product. Moreover, Rogers (1995) also interwove *compatibility* with *relative advantage* as the following quotation shows:

A negative experience with one innovation can damn the adoption of future innovations. . . . When one innovation fails, potential adopters are conditioned to view all future innovations with apprehension. . . For this reason, change agents should begin their efforts with a particular audience with an innovation that has a high degree of relative advantage, so that they can build successively on this initial success (p. 227-228).

Earlier, I explained why I combined the responses from two questionnaire items--*item 2(b)*, criteria for ranking competing products; and *item 4*, features required for a product to be considered. The responses overlapped so extensively that tandem compilation made

more sense when aligning them with the analogous attributes of innovation from the Rogers model.

*Relative advantage implicit in all response sets.* By considering the responses from both questions together and grouping accordingly, *relative advantage* was implicitly interwoven with the interviewees' previous experiences and needs--dimensions of *compatibility*. Hence, while all 17 of the desired-feature theme-sets aligned explicitly with one or more dimensions of compatibility, they also issued implicitly from the *relative advantage* construct, and are thusly displayed in *Appendix F*. In later sections of this chapter, I further elucidate the interwoven constructs--*compatibility* and *relative advantage*--as I examine the opinions and behaviors of specific users of one or both of the two leadership products under investigation.

#### *Complexity Analogue*

*Construct illustrated.* Rogers (1995) defined complexity as the "degree to which an innovation is perceived as relatively difficult to understand and use" (p.242). His research indicated that the more difficult an innovation was to understand and use, the more reluctant would be potential adopters to embrace it. Hence, it would diffuse more slowly and less broadly in the social system of targeted users. Citing the home computer as an example, Rogers (1995) pointed out that early users were techno-buffs and engineers who loved technical wizardry and, having honed their computer skills on mainframes or minicomputers, considered the personal computers easy to use in comparison. On the other hand, novices without technical backgrounds who adopted personal computers in the 1980's "typically went through a period of intense



frustration . . . baffled by how to connect the various components, how to get word processing and other software programs to run . . . puzzled when trying to read a computer manual . . . [and getting] little help from salespeople who talked a confusing technical jargon" (p.243). Although home computers had been adopted by 30% of U. S. households at the time Rogers (1995) published his fourth edition of *Diffusion of Innovations*, he concluded that "the perceived complexity of home computers was an important negative force in their rate of adoption in the early 1980s" (p.243).

*Generic items analyzed.* Several of the desired-attribute groups shown in *Appendix D* and previously slotted in the *compatibility* analogue also issued from the *complexity* analogue. Most explicit of course was the set of five (*k*'s) which specified ease of use as a prerequisite. Implicitly issuing from the *complexity* analogue were attributes such as (*m*) availability of support materials; (*p*) plenty of visuals; (*n*) outlining-type layouts and manageable lengths; (*q*) listed objectives and concise summaries accompanying units or modules or complete packages. Moreover, two of the four items in the (*-b*) set of reasons for rejecting a product (*Appendix E*) issued from the opposite direction of the *complexity* analogue: "too structured for me to adapt to my situation" and "if it required too much adaptation." In sum, the cited desired-attributes which aligned with the *complexity* analogue were features that tended to increase product knowledge and understanding; this in turn facilitated product use by insuring clarity of content and ease of delivery--in other words, decreased *complexity*.

*Trialability and Observability Analogues*

*Rogers' constructs illustrated.* Rogers (1995) defined *trialability* as "the degree to which an innovation may be experimented with on a limited basis"(p.243), and *observability* as "the degree to which the results of an innovation are visible to others"(p.244). Using Nintendo's successful entertainment systems, Rogers (1995) illustrated the difference between the *trialability* and *observability* constructs. *Trialability* was achieved by setting up displays in toy stores where children could play with Nintendo game-players for fun and for free any time they were in the stores. The marketers felt such practice would make families more keenly aware of the new game-player's superiority over previous and competing game-players. *Observability* was accomplished by large-scale advertising which showed targeted children and their parents how the game-players were being played with immense pleasure by all children trying them out; the message also explained how the players could be purchased or where they could be played without purchase. The illustrations served as a kind of visual template by which I aligned analogous features displayed in *Appendix D*.

*Generic items analyzed.* The sets of desired attributes that implicitly issued from the *trialability* and *observability* analogues were few: one(*m*)--availability of trial copy aligned with the *trialability* category; four (*g*'s)--evidence of prior successful use, and three (*i*'s)--field-tested, all aligned more with the *observability* analogue, albeit, the evidence could be in a video-, an audio-, or a print-based medium, in a live person's testimonial, or in a potential user's real-time observance of a field test in progress. If, on the other hand, an interviewee had indicated a need to field test a product personally

before adopting it or purchasing it, then *trialability* would have been a more appropriate analogue.

### *Results from Product-Specific Questionnaire Items*

Having examined Rogers' attributes-of-innovation in the context of disseminating innovative leadership products, generically speaking, I then used the findings as a contextual backdrop against which to frame a more focused analytical look at the two selected products under investigation: *Leadership Case Studies* (MDS-#279) and *Breakers Leadership Simulation* (MDS-#278). *Items 13-15* on the telephone interview questionnaire elicited information regarding interviewees' (a) awareness of NCRVE leadership products in general, and (b) use of the *Cases* and *Simulation* specifically. The previous continuum-of-use levels were therefore modified to focus on the product-specific questionnaire items 13-15 and their related product-involvement and behavioral event forms. The interviewees' transcribed responses were sorted accordingly and the findings examined in the context of the attributes-of-innovation template, alluding to other facets of the Rogers diffusion-of-innovation model, as they surfaced.

#### *Aware of NCRVE Leadership Products But Did Not Use Them.*

Three interviewees were aware of the products but had not used them. One responded to *item 13*, "How did you learn about NCRVE leadership products and what were your initial impressions?" as follows:

I am sure Dr. [\_\_\_\_\_ his superior and also the chief person named as someone whose opinion he would seek out when evaluating a product] mentioned them to me so he must have been involved with some people who were developing them originally. So I may have been monitoring the wrong

information bases, because I wasn't nearly as well informed about them as I should have been. But I only blame myself because I was monitoring ASTD type stuff rather than the traditional NCRVE type stuff.

Although he regretted being unable to provide an opinion about the *Leadership Case Studies* and the *Breakers Leadership Simulation*, his response to item 14 asking for the extent of his involvement in and use of those specific products was insightful.

A second interviewee had learned about the products through his wife and nationwide networking activities. His initial impressions, hesitantly voiced, were "just so-so." Factors he cited as reasons for not using the products included these: (a) He believed that leadership should not be taught separately but should be integrated in all courses involving administration, planning, curriculum development, etc. Students, he maintained, didn't have time to take a separate course in leadership with all their other requirements; with tuition on the rise they needed to get finished as soon as possible. (b) NCRVE's leadership materials, he felt, were too "big and bulky . . . appear to be semester long types of courses which don't fit our mold out here . . . "; therefore, he preferred materials that could be used in smaller units "in several different courses at several different levels."

The third interviewee had not just observed, but had participated in the development process of some of the leadership products, recalling that "I have the unique position of having been involved since the very inception." She had first provided names of vocational leaders for the NCRVE team investigating leader attributes. Later she had reviewed the leadership instruments and a leader's guide that were developed as a result

of that research. Finally, she had reviewed Moss's leadership program for underrepresented groups. Asked about the selected products for the present investigation, she recollected as follows:

I remember the *Case Studies* and I remember them as being good case studies and hoped that the universities would use them in their classes. I have not personally used those in the work that I am in. I remember the *Breakers Simulation*, but I'm almost blank on it right now.

Although she did not use the two selected products, she expressed her enthusiasm for them, adding that "these products really need to be integrated into higher education's teacher preparation programs." Moreover she lamented what she perceived as insufficient marketing efforts, noting that she wouldn't have known or been aware of the products had she not been involved in that initial research, and concluding that "If you develop beautiful materials with all kinds of good stuff in it and don't market it, it just sits on somebody's shelf." In reference to the instruments she had reviewed, the interviewee said she had not used them previously, but was in the process of "digging into them right now for use with a Brazilian project . . . [which she ] had turned over to someone else" and would be providing that person with the materials.

*Aware--Did Not Use MDS#278 or MDS#279; Used Another Product*

One interviewee was aware of NCRVE products through her doctoral advisor. Although the interviewee had completed her doctoral studies and embarked on a career at a non-UCVE university, she recalled with enthusiasm attending as a doctoral student, a seminar by Jerome Moss, Curt Finch and others whose names she couldn't recall (*trialability*). The materials used in the seminar had been Moss's two-volume

program for developing vocational leaders in underrepresented groups; however, a number of case studies had been included and figured in her overall evaluation.

*Used Cases, but Not Simulation*

*Item 14, levels-of-involvement form analyzed.* Four interviewees had used the *Cases* but not the *Simulation*. *Attachment A* of *Item 14* on the interview instrument attempted to ascertain their degree of awareness and use of leadership products in three categories: *Simulation*, *Cases*, and *Others*. Three of the four *Case* users had also at least "Scanned the Content" of the *Simulation* and one had "Read Selected Parts" of it. Two had observed (*observability*) the product being field-tested (*trialability*) by a colleague. Both felt the *Simulation* was geared for less seasoned students. More importantly, the second column elicited information about the nature and extent of the interviewees' use of the *Leadership Case Studies*. *Appendix G* shows *Item 14's* comparative responses of the four *Cases-only* users. They were synthesized from the *Item 14's* level-of-involvement responses in the second column that pertained to the *Leadership Cases*. The comparative chart uses the same levels-of-use categories as the attachment and labels the users' responses as C1, C2, C3, and C4 across the top, facilitating comparison.

All reported having scanned the entire document and having read selected parts. Only one reported having read the entire document; albeit a second qualified his "no" response with "not carefully." The settings in which the *Cases* were used varied: (a) a human resource development course, (b) a leadership seminar, (c) curriculum development courses, (d) leadership development course, (e) administration of

education-for-work course. All were graduate level courses of UCVE member institutions. The third column of the form, shown as part of the interview instrument (*Appendix A*) ascertained if the interviewees had used other NCRVE leadership products. Two of the *Case Studies* users had also used Moss's two-volume program for developing leaders in underrepresented groups. Another reported using several of NCRVE's published research studies.

*Item 14, behavioral event form analyzed.* The behavioral events elicited from two interviewees via the telephone interview instrument were instructive when examined in tandem. One respondent described his using the cases as part of a seminar for administrators renewing licenses or seeking new titles, and for teachers aspiring to be administrators. The second user described a class consisting primarily of vocational-technical graduate students, full-time and part-time. The part-time students were primarily teachers and vocational school directors working full time and pursuing graduate studies part-time. The instructor in the small group seminar format described how he used the cases. First, he had the seminar participants read the cases prior to a session. When the case-study session convened, he led a group discussion about the respective cases previously read. Then the participants role-played the different personalities involved in the cases, an activity designed to "extend the decision-making process and move from problem to resolution," explained the interviewee.

The second interviewee also noted the move from problem to resolution in his statement that using the cases had generated "possible solutions and courses of action."

His description of how he had used the cases was somewhat different from how the first interviewee had used the cases, however. Moreover, he lamented that his first use of "having groups come up with answers had less interaction with larger groups."

Then, almost fortuitously, he recalled how " a fellow on campus did a workshop on the use of case studies which involved the lead-in question approach, [and] added a nice dimension." He had used two other approaches: (a) assigning the cases to be read outside of class and sharing ideas in class; (b) scanning the cases in class; then dividing into small groups, each assigned a different case; respective groups deriving answers as a team and then sharing those answers with the whole class. Assessing all three methods, the interviewee concluded that even though

the first two were effective, the dialogue approach seemed to work better; because they had to justify different options put forth. All of the students had to read the same cases; then we would start with the questions provided, then follow up with discussion and probes. . . Examples of follow-up types of probes were, "Why did you say. . . ?" or, "What if . . . ?" etc.

The *trialability* of the cases enabled both interviewees to experiment with methods of use.

#### *Used Simulation but Not Cases*

*Item 14 analyzed.* Two interviewees were *Simulation* field-testers who had not used the *Cases*. When asked about the *Cases*, one interviewee said, "I did not know that you were marketing any leadership products. . . I've never seen them advertised; nothing has ever crossed my desk concerning them." Speculating as to why, he said, "We have seven of us, and we go in all different directions. Once in a while we meet like ships in



the night. . . or maybe they sent them to department heads," other than the current one who had shared the *Simulation* with him. The second interviewee also was not familiar with the *Cases*, even though another person in the same department had field-tested the product and the department head had used some of the cases as well.

Levels of product usage reported by the two *Simulation*-only users also differed. One interviewee had initially decided not to use the product after the field-testing experiment. The students, he felt, were too advanced for the *Simulation* activity. Instead, he had selected a business-based simulation for the next year. Subsequently two factors had converged to change his mind again: (a) the business-oriented simulation had not been sufficiently relevant, and (b) his pool of students had become increasingly comprised of fewer experienced personnel and more novices. Thus he had reconsidered the *Simulation* and had begun using it again. The second interviewee had been the more enthusiastic of the two in the initial usage, but had not re-used the product despite having observed what he reported as excellent results as well as having received positive feedback from most of the participants. I wondered why and a plausible reason surfaced as I examined the information provided by interviewees who had used both the *Cases* and the *Simulation*, one of whom had also been a *Simulation* field-tester.

#### *Dual-User-Field-Tester Interview Informs Analysis of Simulation-Only Interviews*

Of the three dual-users of the *Cases* and the *Simulation*, one was somewhat uniquely a *Simulation* field tester like the two identified in the previous category of *Simulation*-only users. Thus, having already examined behavioral events related to product use from the two previous *Simulation* field testers, I then compared those events

with the behavioral event offered by the field-tester who had also used the *Cases*. The conclusions and inferences thusly drawn are also discussed in Chapter 5.

#### *Users of Both Cases and Simulation*

*Comparative opinions analyzed.* My next challenge was to analyze comparative information elicited about the two respective products--*Cases* and *Simulation*--in order to ascertain what attributes, if any, may have influenced the extent of dissemination and the consistent 6:1 ratio of *Cases* sales to *Simulation* sales. *Item 15* on the telephone interview instrument was designed to elicit the strengths and limitations of both products. Two interviewees had used both products--MDS#278 and MDS#279. A third had used a bundled version of the products within a broader school reform initiative marketed several years later by NCRVE. Rogers (1995) considered such a re-packaging of the innovation as *reinvention*. *Appendix H* combines all dual users' responses to *item 15*. The strengths and limitations are grouped thematically, with each letter representing a theme and each repeated letter representing another response thematically similar.

#### *Single-Product Users—Item 15 Responses*

In addition, I sorted the single-product users' responses to *item 15* using the same letters for thematically similar phrases and adding new letters for new themes that issued. This process resulted in *Appendix I, Users of Simulation Not Case Studies; Appendix J, Users of Case Studies, Not Simulation; and Appendix K, Strengths and Limitations* (a composite of all users comments from *Appendixes H, I, and J*—thematically arranged with *Case*-attribute themes in the left column and

thematically parallel *Simulation*-attribute responses in the right column). By carefully examining these charts I gathered additional insights relative to the applicability of the attributes-of-innovation construct in the dissemination of the two selected products. Taken as a whole, the results support the findings for both products that were evidenced in the continuum-of-use and behavioral event forms explicated earlier in reference to *Item 14*. The synthesized conclusions of those findings are proffered in Chapter 5.

### Chapter Summary

I began this chapter by briefly reviewing the information collected and used in this study--the nature and purpose of which I fully delineated in Chapter 3. The information consisted of (a) quantitative sales data and other NCRVE support materials, and (b) responses to questions on a semi-structured telephone interview instrument. Then I explained how I distilled information from the questionnaire responses and generated findings--implicit and explicit. By then positing the results in the framework of appropriate analogues on the Rogers (1995) diffusion-of-innovation template, I unraveled the research questions. After a prefacing summary in Chapter 5, I proffer my conclusions and their implications for future research and practice.

## Chapter 5

### SUMMARY, CONCLUSIONS, IMPLICATIONS

#### Summary of the Study

##### *The Problem*

Reviewing the literature on educational change, I noted the broad chasm of time between development of innovative educational products and their subsequent optimal dissemination among targeted users. Logically, if educational researchers and change agencies could maximize knowledge and use of well-researched innovations, the benefits of those innovations would be manifested more rapidly and spread more broadly among the potential user populations. Hence, the need to ascertain the nature of the time-gap and how it could be bridged became the focus of this study. Past research studies have chronicled the length of time between development and widespread implementation of educational innovations: Mort (1964) for example, estimated the time-span to be 50 years; recently Rogers (1995) indicated that the time-span had been reduced to 25 years. During the intervening years research centers and universities cradled empirical studies for the purpose of spearheading transformative educational reforms. (Bennett, 1974; Finch et al., 1991; Hull & Parnell, 1991; McCaslin & Walton, 1973; Oscarson, 1976; Rogers, 1983; Rogers & Shoemaker, 1971; Schaller, 1972; Schmidt et al., 1992).

Nevertheless, the 1980s continued to reverberate with searing criticisms of public schooling by renown institutional voices--namely, *A Nation at Risk* (National

Commission on Excellence in Education, 1983); and *The Forgotten Half* (William T. Grant Foundation, Commission on Work, Family, and Citizenship, 1988). Such criticisms during the 1980s fueled the contemporary perception of public education as a crippled anachronism--systemically stiff, pedagogically lethargic, and institutionally immune to positive changes. Although an era of intense pressure to transform education ensued, accompanied by a 10-fold increase in education diffusion studies, the 25-year gap has persisted to the present (Rogers, 1995). Moreover, public schooling's mission and mandate have expanded to include equipping *all* citizens for dual roles as (a) productive workers in the highly technical, global economy and (b) principled, responsible members of families, institutions, and communities.

Thus the time-gap is now particularly problematic in view of two growing phenomena: first, a rapidly expanding knowledge base; and second, rapidly changing technology and its attendant consequence--faster obsolescence of most innovations in all domains, including education. Spurred by the broader mission and facilitated by instant communications and grassroots-driven, deficit-reduction governance policies, demands for higher quality education continue with growing intensity. Taxpayers have begun to scrutinize and question allocation of dollars spent on public education. Using political scalpels, they endeavor to extract with surgical precision what they perceive to be metastasized polemic fat and bureaucratic tumors responsible for a debilitated, lethargic system, resistant to positive change. Moreover, in spite of the increased education diffusion studies cited by Rogers (1995), my research uncovered a paucity of investigations about how three critical factors may have influenced dissemination of

educational innovations—first, the nature of the patterns of purchase and use of innovations as representing the extent of potential target market penetration; second, the role of management climates in facilitating or inhibiting innovation; and three, the properties of the innovations themselves as influencing purchase and use of educational innovations.

### *Investigative Scope and Conceptual Framework*

#### *The National Center's Early Efforts*

Education research centers are change agencies charged with developing and disseminating empirically-sound education-research for optimal application among practitioners. The National Center for Research in Vocational Education, University of California, Berkeley (NCRVE/UCB) is the research center most involved with disseminating research and innovations in the education-for-work arena. Over the years, its member institutions and other similar organizations have conducted numerous studies attempting to measure the efficacy of vocational-technical education using a variety of conceptually sound and well-constructed frameworks. These included an agricultural model (Bennett, 1974); a cognitive-affective-behavioral psychological model (McCaslin & Walton, 1973; Oscarson, 1976; Page, 1973; Rogers, 1962); and an organizational change model rooted in the University of Texas' Concerns-Based Adoption Model (CBAM) and subsequently refined as needed by Aneke (1996) and Long (1994). In 1988 the National Center for Research in Vocational Education was restructured and its headquarters relocated to the University of California, Berkeley.

### *Restructured Synergies*

The reconfigured Center thus cultivated new turf and countenanced changing directions that yielded dynamic new synergies in research and dissemination in the education-for-work arena. Voluminous studies ensued by NCRVE and others about workplace change and education preparation. Despite such efforts, the need to measure the parameters and patterns of dissemination strategies for the multiplicity of practices and products--designed to effect positive changes--continued to surface. In the education-for-work arena, specifically, several questions surfaced regarding how the three previously enumerated factors may have influenced dissemination of innovations. First, to what extent have research findings and innovations resulting from those findings been optimally disseminated among those who could benefit from them? Second, what kinds of organizational structures or management practices tend to inhibit or accelerate the process of disseminating innovative changes? Third, to what extent does the design or other properties of innovations affect their spread and use among those who can benefit from them? These investigative challenges could not adequately be explored by the popular theoretical models used previously for two reasons. First, the prior models assumed linearity of behavior change, an assumption that frequently did not hold true; second, the models failed to consider attributes of innovations as factors influencing their use-parameters--facilitating or impeding broad-based acceptance, accordingly.

### *The Rogers Model Selected and Described*

In contrast, the Rogers framework encompassed both a linear and non-linear diffusion analogue that included the attributes-of-innovation construct. Using the Rogers

(1995) diffusion-of-innovation conceptual framework, I focused my attention on NCRVE's role as a change agency dedicated to a two-faceted mission--developing productive, skilled workers *and* principled, responsible citizens--a mission towards which it advanced largely by disseminating well-researched publications. Hence, the descriptive, statistical overview and contextual backdrop for this study derived from the Center's quarterly and annual reports, its Catalogue of Products, its on-going communication and publicity programs in all media, and its special projects or other marketing initiatives used by the dissemination and training program area. First, the reports were a reasonable facsimile of the Center's development and dissemination process. As such, they outlined key components of dissemination analogous to constructs on Rogers diffusion-of-innovation model.

#### *Research Questions*

From these reports and from a review of the Center's product catalogue and communications programs, the three possible influencing factors were refined and reconfigured as research questions:

***Research Question #1:*** To what extent did unit sales for two implementable leadership products published during the fourth quarter of 1992 follow the sigmoidal (S-shaped) distribution as predicated by Rogers (1995)?

***Research Question #2:*** To what extent were early users of the products also members of institutions that facilitated innovation and autonomy in decisions?



***Research Question #3:*** Were the perceived attributes of selected National Center products comparable to their generic analogues in the Rogers model, and did they function similarly in terms of influencing the extent of dissemination among targeted users?

Armed with new insights about these questions, researchers can refine their innovation designs and marketing strategies accordingly--with an eye toward obtaining broader market penetration and thereby increasing the value of such innovations for society. The society's beneficiaries will be the taxpayers who fund the research, as well as learners who gain from the innovative applications of the research.

#### *Research Design and Instrumentation*

##### *Products and Program Area*

In the context of Rogers' diffusion-of-innovation framework, only the products defined as implementable innovations could be examined according to the model. Moreover, since most publications tend to become obsolete in four to six years, the study was restricted to implementable products published in the last quarter of 1992 (the final year of Berkeley's first 5-year grant) and disseminated in the years that followed, having likely reached their distribution peaks and been supplanted by subsequent publications. Additionally, among the five NCRVE program areas which produced products to be disseminated, professional development was the logical one from which to select products for study, because change in education has traditionally percolated from university laboratories to the state-level education departments and then downward to the districts and municipalities. The Center's professional development program area

targeted its products primarily to university and state-level personnel charged with spearheading education reform--especially in the education-for-work arena. A closer examination of the NCRVE's Leadership and Development Program's fourth-quarter 1992 publications revealed that only two were implementable innovations at the university or state level: (a) *Leadership Case Studies* (Finch et al., 1992) and (b) *Breakers Leadership Simulation* (Finch, 1992).

### *Participant Pool*

The fact that educational change usually emanated from universities also meant that NCRVE's Leadership and Development Program's target market comprised a rich pool of potential participants for the study--professional development leaders in universities. Moreover, the participants selected from such a pool of potential users were somewhat prescribed by the Rogers (1995) model which conceptualized early users as opinion leaders. Thus, I enlisted 15 such persons for this study, reasoning as follows: First, as a group, these professionals exerted influence disproportionate to their size by impacting positively or negatively other potential users' perceptions of the two implementable leadership products; second, as opinion leaders they influenced the ultimate extent of product-distribution and the magnitude of the products' disparate sales figures. Moreover, although numerous persons in the targeted pool of potential users were amenable to being interviewed, I followed the criteria offered by Ely et al. (1993) in ascertaining that 15 were enough opinion leaders for me to interview: First, "the researcher should know that he or she can talk for the participants—as the participants—in a legitimate way" (p.91); second, "if there are too many unanswered questions

pertaining to the questions asked [via the interview protocol](p.91)” then more interviews would be needed; third, the authors cite Lincoln and Guba (1985) who “tell us that when data repeat themselves, when the researcher has confidence that themes and examples are repeating instead of extending” (Ely et al., 1993, p.92) then the researcher has likely collected sufficient information. Based on those criteria I had accrued sufficient information by the time I had interviewed 13 individuals who were familiar with NCRVE leadership products and two who had never heard of the products.

#### *Levels of Involvement*

The 15 target-market opinion leaders selected for in-depth interviews represented a complete range of NCRVE product-awareness and involvement levels. I discerned nine such levels and coded them as indicated in Chapter 3. Of the 15 interviewees, two had never heard of NCRVE's leadership products; one was slightly aware, but not enough to voice an opinion and eager to learn more; the remaining 12 were familiar with NCRVE leadership products and had formed opinions--all of which were favorable except one. Ten of the 12 were users of one or more of the leadership products; none of the 10 actual product-users had unfavorable opinions. Finally, nine of the 10 users had used one or both of the selected products one or more times.

#### *Case-Study Approach*

The research design that could best frame an in-depth investigation of the dissemination and use of the two selected leadership products was the case-study method, with each leadership product comprising a case for study. Persuasive arguments for case-studies as rigorous research were advanced by Yin (1989) and Lasonen and Finch (1995).

Unlike forced-choice surveys and experimental blind studies, the case-study approach did not remove the subject being studied from its real-life context (Yin, 1989). Moreover, the case-study method had "a rich history of success in applied research and evaluation. . . [and was] a particularly powerful approach in situations where depth and richness of evaluation information [were] needed"(Lasonen & Finch, 1995, p. 11). The value of the case-study approach in this investigation crystallized as the literature revealed that seasoned professionals in a variety of fields demonstrated how carefully designed case-study research was not only empirically sound but also a richly rewarding adjunct to the traditional array of research tools (Chidamber & Kon, 1993; Ely et al., 1993; Kearns, 1992; Kralewski et al., 1992; Lasonen & Finch, 1995; Maynard-Moody, 1989; Schmidt et al., 1992; Silverman, 1993; Sonnichsen, 1989; Yin, 1989).

#### *Rogers' Model and the Case-Study Approach*

Most education case-studies testing Rogers' (1995) diffusion-of-innovation theory used as cases either sites where innovations were being implemented or persons who were choosing to implement the innovative programs. Few focused on the extent of dissemination, the hierarchies of targeted user organizations, or the properties of the innovations being disseminated, even though Rogers (1995) documented that the perceived attributes of an innovation substantially impacted its ultimate dissemination and use among the targeted users.

#### *Information Gathering and Instrument Design*

Because the innovation-focused case-study investigation required "a systematic record of a specific innovation . . . [data was] mainly qualitative and obtained through

interviews, public records, and archival data . . . "(Chidamber & Kon, 1993, p. 8). Semi-structured telephone interviews and archival data were therefore used to study the dissemination and use of the two selected leadership products. First, I contacted the participants by phone and asked them to participate in a 20-40 minute tape-recorded interview relative to their knowledge and use of innovative leadership products in general and the NCRVE leadership products in particular. Then I faxed them a copy of the two-part questionnaire, with a cover letter thanking them for permission to tape-record the interview, confirming the date and time set for the taped conversation, and reiterating the importance of their opinions.

The first part of the two-part instrument consisted of 12 generic questions primarily about innovative leadership materials--how the participants learned about them and decided which ones to use. The second part consisted of three questions specific to NCRVE leadership products--asking the respondents to explain their opinions and use-patterns of those products. To frame the input for the second part, I included a levels-of-use form and a behavioral-event form as attachments. The levels-of-use form was used extensively in past studies conducted by vocational education researchers (McCaslin, & Walton, 1973; Page, 1976). Moreover, Schmidt and others (1992) recommended the behavioral event interview (BEI) since researchers across a variety of disciplines, "including business, industry, education, and the military" (p.9) had demonstrated its effectiveness.

## *Results*

The two products that I investigated as innovations in the context of Rogers' diffusion theory--one a leadership simulation and one a set of case-studies in leadership--were developed and published almost simultaneously and targeted to the same user groups of professionals preparing future leaders in the education-for-work arena. Using a case-study approach, I compared the two products' respective dissemination patterns, interviewed 15 targeted-group opinion-leaders and examined the context of product-related materials issued by the change-agency. The purpose of the study was three-fold: (a) to ascertain the extent to which the selected products, published during the fourth quarter of 1992 and subsequently disseminated, conformed to the S-shaped distribution curve as predicated by Rogers; (b) to determine if other factors, such as nurturing or impeding organizational climates typified the respective work-place climates of the 15 interviewees and influenced their respective abilities to purchase innovative products, as theorized by Rogers (1995); and (c) to find out how closely the attributes of the two selected products dovetailed with their generic analogues on the Rogers template and influenced product-acceptance accordingly. Below, I have briefly summarized the results of the three-fold inquiry.

The results pertaining to the first purpose--(a) ascertaining the degree of conformity of the leadership products' dissemination patterns with the S-shaped sigmoidal prototypical distribution curve--were overall inconclusive. The sales figures for both products conformed inversely with the first half of the bell-curve. Moreover, the unit sales for the *Leadership Case Studies* were six times higher than unit sales for the

*Simulation* in each of the first three years of sales. Although seemingly enigmatic, these results, when examined in the context of other Rogers-model constructs, were explainable and also illuminated aspects of the remaining research questions, as I discuss further in the section entitled "Conclusions." Next, the results pertaining to the second purpose--(b) ascertaining if the interviewees' respective work-place climates tended to nurture or impede innovations as hypothesized by Rogers (1995)--confirmed Rogers' theory that autonomy and teamwork characterized management climates where innovation tended to flourish. Moreover, all 15 interviewees were affiliated with institutions so described. Within such organizations, the field-testers of the selected products were *opinion leaders* as construed by Rogers. Finally, the results related to the third purpose--(c) determining how well the attributes of the two selected products conformed to Rogers' generic *attributes-of-innovation* construct--confirmed that features of both of the selected products were similar in nature and function to their generic analogues on the Rogers template. Moreover, as I teased out these attributes from the transcribed interviews, the evolving information exposed new insights that clarified my conclusions about these results and further informed the inferences that issued from them.

## Conclusions and Inferences

### *Findings Flow from Model Analogues*

By confirming and extending the above-enumerated Rogers-model theoretical constructs, the findings provided "analytic generalizability" (Yin, 1989, p.44). According to Yin, well-designed case-study research is as empirically rigorous and sound as

experimental research, when appropriately conceptualized. A single case-study investigation, he contended, is similar to a single, small experiment in the following sense:

Scientific facts are rarely based on single experiments; they are usually based on a multiple set of experiments, which have replicated the same phenomenon under different conditions. . . . Case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a "sample," and the investigator's goal is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)" ( p. 21).

Accordingly, the analytic generalizability of the findings in this study catalyzed the formation of conclusions and the inferences that appear to flow from them. These issue from the previously enumerated results of the study as well as from the research questions' corollary theoretical constructs--sigmoidal distribution, targeted social system, and attributes-of-innovation. The nature and function of these Rogers-model constructs, when applied to the dissemination of the selected leadership products, are similar to their respective analogues on the Rogers diffusion-of-innovation template. After reviewing numerous empirical studies across multiple domains, Rogers found ample support for his theoretical model. This study is no exception, as the conclusions that I discuss below so document.

***Research Question #1: Degree of Conformity with the S-Curve***

To what extent did the unit sales of the implementable leadership products published in the fourth quarter of 1992 follow the sigmoidal (S-shaped) distribution as predicated by the Rogers (1995) model?



Why did the sales data for both the *Leadership Case Studies* and the *Leadership Simulation* reveal an inverse-sigmoidal pattern (the second half of the bell-curve) rather than the prototypical sigmoidal pattern (the first half of the bell-curve)? I discerned two interrelated scenarios as I re-examined the literature and the product-development phase that preceded publication of the two documents. First, the review was instructive in revealing that the 5-year product-development phase had culminated in field-testing the products in 1991-1992. This implied that dissemination of both products may have actually begun during the developmental stage, culminating in the potential critical-mass level during the field-tests. Under this scenario, the peak sales in 1993 likely represented purchasers who were early purchasers but later users—non-purchasers thus comprising most of the early users. According to Rogers, later users cluster at the “top-peak” of the bell-curve, from whence they then begin to decline in a downward pattern shaped like the second half of the bell-curve (Rogers, 1995).

A second scenario was also plausible, as evidenced by the McCaslin and Walton (1973) and the Page (1973) findings related to assessing usage of specific education-for-work, research-based products. The researchers found that accurately measuring usage of a product disseminated by a research center was not possible because records reflected only purchases and purchases did not include many users. For example, complimentary copies could have been used by a recipient one or more times and then loaned to another person for use one or more additional times (McCaslin & Walton, 1973; Page, 1973). Similarly, records of all users of *Cases* and *Simulation* had not been archived--only total unit sales and some individual purchasers who may or may not have been users.

Moreover, because I could only retrieve annual unit sales figures--not quarterly figures--from the archived data base, I surmised that the sales figures as graphed may have represented an adumbrated semblance of dissemination at best. Most likely the graphed sales typified the later users as described above, and did not include the key opinion leaders who first used the products or repeat users--whether purchasers, borrowers, or recipients of complimentary copies.

In order to verify whether or not dissemination began during the field-testing stage as the results implied, additional data would need to be collected, archived, and tracked in a systematic, on-going way. In this era of instant and interactive world-wide communications, record-keeping systems are extraordinarily multifunctional. Thus, the task of tracing and recording events that involve individuals using the internet or telephones to inquire about or download specific products and product-information, is a doable and worthwhile project, albeit very challenging. Equally valuable would be the recording, sorting, and tracking of recipients of complimentary as well as purchased copies of leadership products. Demographic and personal information such as zip code, date, institutional affiliation, position, etc.--would likely provide valuable insights when such recipients are followed up and polled about their opinions or queried for suggestions.

#### *Related Constructs Elucidated*

Examination of the product sales figures, as graphed for the two selected leadership products, also highlighted related constructs: the targeted *social system* of potential adopters and *channels-of-diffusion*. The S-shape or first half of the bell-curve

represents, according to Rogers (1995), an innovation's diffusion progress through *channels* over time, from introduction, to peak period of adoption (or use) by the members of the targeted *social system*. Although Rogers did not clearly define the parameters attendant with the "peak" period of adoption, he indicated that the optimal point for the curve to peak would be when more than half--a majority--of the members of the targeted social system had embraced the innovation. Assuming the *Cases* and the *Simulation* actually began dissemination during the field-testing phase and were optimally disseminated, then they would have been embraced and used by the majority of UCVE professionals engaged in preparing education-for-work leaders. If that were the case, more than half of the professionals who responded to my e-mail inquiry would have been enthusiastic users of the products. Instead, more than half of the 60+ respondents had never heard of the NCRVE leadership products, and some who had heard of them were either unaware or just tangentially aware of the *Cases* and the *Simulation*.

#### *Configuring Communication Channels*

Why had the two products not disseminated more broadly among this rich pool of opinion leaders whose influence in state-level education policy and practice is profound? For this finding, two possible reasons surfaced. First, NCRVE's dissemination channels may have been configured too restrictively, causing information to by-pass some key opinion leaders. If the opinion leaders (whose clients could benefit from the innovative products) were not aware that the products existed, they could not embrace or use them and therefore could not influence others to use them. Thus, non-cognizance, by default, would have impeded dissemination of the innovative products. Rogers (1995) proffered

that mass media were more effective at the awareness stage of dissemination, and that interpersonal networks were more effective at the persuasion stage. Because mass media channels reach more people they also reach proportionately more opinion leaders. Accordingly, to maximize an innovation's value to its targeted social system population, "communication channels must be used in an idea time sequence, progressing from mass media to interpersonal channels" (p.195). Based on numerous studies, he concluded that to begin with interpersonal networks when mass media were more appropriate would impede the extent of adoption. Such a scenario was probable with respect to the limited dissemination parameters of the *Cases* and the *Simulation*.

Second, the propensity for targeted users of those products to employ electronic media to continually "scan" the horizon for new innovative materials led me to conclude that in addition to the dissemination channels possibly being too narrowly configured and thereby by-passing some targeted opinion leaders, the product information may have reached some opinion leaders, but was not bold enough and distinctive enough to be archived in their memories and later retrievable as needed. The ancillary findings, imbedded in the responses to the generic interview questions, supported both scenarios. Hence, I mined them for additional conclusions as the ensuing paragraphs reveal.

*Selection of field-testers.* First, I posit that the selection of key opinion leaders from the University Council for Vocational Education as field-testers--an ideal cluster at the persuasion stage--was perhaps not sufficiently broad and diverse at the awareness stage. Moreover, Rogers (1995) determined that innovations enter markets from a variety of sources. Therefore, to extend the publicity about the leadership products to other

networks of opinion leaders beyond the education-for-work arena (i.e. associations of school boards, taxpayers, labor unions, non-profit agencies, student groups, manufacturing associations, etc.) would likely trigger creative ideas for linkages between groups and generate new applications for the products.

*Impact of product design.* Second, the product information may have reached some opinion leaders, but was not sufficiently bold or distinctive to be archived in memory and retrieved when needed. According to Rogers (1995), opinion leaders continually scan the information-horizon in search for solutions to perceived needs. Hence, if such "scanners" were exposed to the leadership products when they were not in need of them, the products would not likely be archived in memory unless they were distinctive and bold enough to stand out and make a lasting impression. Were the targeted users of the leadership products also scanners as described above? If so, were the products not sufficiently bold and distinctive and hence, not remembered by some in the targeted group who were not in the market for such products at the time?

The answer to the first question was unequivocal. All of the interviewees indicated that they searched for and learned about materials using a variety of avenues synonymous with "scanning." Among the resource avenues were professional journals, brochures, and sundry promotional literature. Particularly noteworthy was the emphasis on the internet, listservs, specialty networks, and interactive discussion groups and forums. From the interviewees' responses, I was able to tease out the answer to the second question--an answer which I then framed with the second seemingly enigmatic

ancillary finding revealed by the sales data--the disparity between the unit sales of the two products.

*Disparate sales figures explored.* The *Cases* outsold the *Simulation* by a 6:1 ratio for three consecutive years. What could account for the magnitude and consistency of this difference? Although this question may never be answered definitively, plausible explanations unfolded as I probed further the thematic responses which illuminated additional constructs on the Rogers diffusion-of-innovation model. For example, when I reviewed the product-development phase of both products as described earlier, I noted that the *Cases* was field-tested at six sites; whereas, the *Simulation* was field-tested at only three sites. This could logically explain part of the disparate unit-sales figures between the two leadership products.

In addition, the 15 interviewees were *opinion leaders* as conceptualized by Rogers (1995). Nine of these opinion leaders were early users of one or both of the selected leadership products. As such, their perceptions and opinions influenced that of other potential users and therefore helped shape the products' respective dissemination patterns, likely impacting the magnitude of their peak differences. The qualitative information collected from all participants--nine users of the products, four non-users who were knowledgeable about the materials, and two non-users who had never heard of the leadership products--supported the Rogers opinion-leader construct. Comparative opinions of both products revealed distinct qualities associated with each product--distinctions that likely contributed to the *Simulation's* fewer sales and its implied less-broad dissemination parameters when compared to the *Cases*. Moreover, I sorted and

grouped into informational clusters, all of the transcribed responses to the instrument items--both generic and product-specific items--exposing thematic threads and illuminating patterns and patches of information, opinions, and recollections of events as they gradually unfolded. Then I posited the results in the appropriate analogues on the Rogers template and unraveled the remaining investigative challenges and conclusions.

***Research Question #2--Organizations as Facilitators of Innovation***

To what extent were the early users of the products also members of institutions that facilitated innovation and autonomy in decisions related to new-product purchases?

According to Roger (1995), an opinion leader's willingness to innovate is impacted positively or negatively by the management climate or work-environment where the opinion leader operates. Bureaucratic, policy-driven governance, rigid chains of commands, and autocratic management styles tend to stymie the creative outside-the-box thinking and problem-solving that undergird innovations. On the other hand, flatter management structures, characterized by team management and autonomous decision-making at the lowest feasible level, tend foster innovative thinking and an institutional as well as individual willingness to embrace positive changes. Persons affiliated with such institutions are likely to be among the first to try out new ideas and implement innovative programs. Were the early users of NCRVE leadership products employed by organizations whose management climates tended to (a) nurture and facilitate positive change, or (b) impede and obstruct such changes? All 15 of the interviewees in this study

described innovation-nurturing environments in terms synonymous with the Rogers (1995) concept as delineated above.

*Nurturing environments.* University-affiliated respondents indicated that individual professors in leadership, administration, and professional development were autonomous decision makers, selecting their own materials for use in their professional roles, whether instructional or otherwise. Practices cited most frequently as nurturing innovation included team-building and bottom-up decision-making. Individual respondents also highlighted additional innovation-enhancing practices that were insightful. They included (a) providing opportunities for role modeling and mentoring; (b) cultivating a sense of ownership and responsibility; (c) establishing interdisciplinary committees to share ideas and expand knowledge of innovative leadership products and practices across disciplines; (d) demonstrating a sustained commitment to on-going staff development; (e) encouraging social gatherings among faculty, thereby facilitating impromptu intellectual banter and debates; (f) recognizing occasional failure as a necessary by-product of independent, innovative leadership and problem-solving efforts; (g) establishing a central clearinghouse team to organize and disseminate new-product materials, and to conduct workshops explaining how to capitalize on their strengths; (h) encouraging extensive networking opportunities among professionals in a variety of academic domains and career fields in and out of the workplace; and (i) promoting open communications vertically and horizontally within the workplace.

*Impediments rare.* The most frequently mentioned impediments to learning about and using innovative products were time and money constraints. One interviewee cited



both time and money; whereas three cited only time and four cited only money. Also noteworthy was the fact that four respondents reported never having encountered any impediments to their efforts to learn about and use innovative products as they deemed appropriate. Moreover, all enjoyed a high degree of autonomy in selecting products to use in their respective professional roles. One item on the interview instrument asked the respondents how many levels of approval were required for them to purchase the materials they selected. All reported minimal approval requirements--usually just the department head or the business office or no one. Only one reported five required levels of approval. Most also indicated that normal or expedited processing were options, allowing faster turn-around if the purchase orders were "walked-through." The person who was required to secure five levels of approval estimated that it took only two days at the most to get those approvals. Only one person estimated a routine turn-around time as long as 30 days for processing an order--the bottleneck occurred because only one individual was authorized to write up the official order. Even so, he had never been denied a product request. Finally, only one person cited politics--as expressed in newly configured state legislatures and the upheaval that frequently results--as an occasional delaying factor.

The main thrust of the findings supported Rogers' generalizations regarding organizations--namely, that organizations which provide free and open communications and which vest decision-making authority with those who will most likely have to implement the decisions and be impacted by the outcomes, are organizations most likely to nurture innovations. At the time I conducted the interviews for this study, all 15

interviewees had current or prior professional or student affiliations with UCVE member-institutions. None of them described their respective institutional climates with adjectives and phrases that connoted bureaucratic and autocratic environments.

Moreover, I found no discernible difference between product-users' and non-users' respective workplace climates. All were characterized more by team management and autonomous decisions at the practitioner level. The organizations employing the nine early leadership-product users were therefore among the first institutions to embrace the products, further affirming Rogers' theory that such organizational climates facilitated diffusion of innovations. In addition, I noted that two interviewees who had not heard of the leadership products, plus four who had heard of the products but were not users, worked for organizations similarly depicted as facilitating innovation and autonomy in decisions at the practitioner level. All of the participants were reasonably autonomous decision-makers, seldom hampered by second-guessing business managers or bosses. I therefore concluded that the organizational climates in which these interviewees functioned did not adversely impact the extent to which the two selected leadership were embraced and used by their colleagues who held similar positions in the target-market pool of institutions.

Furthermore, my investigation shattered the stereotypical talk-show and media-driven public perception of universities and state-departments of education as repositories for entrenched bureaucrats and gatekeepers who filter out new ideas or require their metamorphosis beyond recognition in order to be sanctioned or accepted. Finding that all of the interviewees--users and non-users alike--were affiliated with innovation-nurturing

institutions as theorized by Rogers, led me to infer that the vast disparity between the two products' unit sales and the limited awareness of the products among potential target-market users may be rooted largely in the properties of the products themselves. Hence, explicating the final research question yielded additional insights and inferences about the attributes-of-innovation construct.

***Research Question #3: Influence of Attributes-of-Innovation***

Were the perceived attributes of selected National Center products comparable to their generic analogues in the Rogers model, and did they function similarly to influence the extent of dissemination among targeted users?

According to Rogers (1995), studies of different innovation diffusions revealed that five generic features influenced from 50-90 percent of users' decisions to adopt a given innovation. Over several decades, he documented hundreds of studies across a variety of disciplines and innovation categories confirming his concept of the nature and influence of the five generic attributes: *compatibility*, *relative advantage*, *complexity*, *observability*, and *trialability*. These attributes were referent analogues against which I compared (a) the 15 participants' responses to questions about the qualities they deemed highly desirable and undesirable in their search for leadership materials; and (b) more specifically, the selected-product users' responses to questions regarding the two leadership products' respective strengths, limitations, and user-experiences with the products.

*Desirable and undesirable traits compared to referent analogues.* Were the generic attributes functionally and thematically analogous to the characteristics which the interviewees named as important influencing- or prerequisite-factors in their purchase or use decisions? To answer this question, I analyzed the transcribed responses to the related generic questions—questions directed to all 15 interviewees. The analysis enabled me to tease out 17 response-themes--themes that conformed with several referent analogues on the Rogers attributes-of-innovation template. First, I observed that all 17 theme-sets aligned explicitly with one or more of the *compatibility* dimensions, while implicitly exuding interwoven *relative advantage properties*. The largest response-set (11 thematically similar responses) exemplified items comparable to one or more of the three compatibility dimensions listed by Rogers (1995): compatible with beliefs and values, compatible with prior experience, and compatible with needs of users. These *compatibility* dimensions were embedded in the thematic fragments that I extracted from the transcribed interviews. The overarching conclusion was that new products needed to reflect the users' and/or students' beliefs and values; build on the users' prior experiences with sundry products, and the lessons they had learned about what worked and didn't work; and, be adaptable to course objectives and purposes which users had formulated for diverse segments of learners and their respective needs. Indicative phrases were "audience appropriate--public rather than business-sector oriented," "compatible with how I'm going to use it," "closeness to my objectives," and "how well it fits students' needs." Other desired-feature sets similarly fit one or more of the previously mentioned dimensions of *compatibility*.

Five of the 17 response-themes also aligned with the *complexity* analogue, defined as the "degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 1995, p. 242). Two themes were embedded in the *trialability* construct as defined by Rogers: "the degree to which an innovation can be experimented with on a limited basis"(p. 243). Finally, three themes were pegged to the *observability* construct, described as "the degree to which an innovation are visible to others" (p.244). Taken as a whole, the responses to the generic questionnaire items elicited numerous desired new-product characteristics, all of which had comparable analogues on the attributes-of-innovation template. These findings then became the contextual landscape for a more ground-breaking, analytical focus on the narrower comparison of product users' responses about the two selected products that I investigated: *Leadership Case Studies* (MDS #279) and *Breakers Leadership Simulation* (MDS #278).

*Product-users' perceptions and recollections compared to referent analogues.*

Were the previously described referent-analogue attributes also manifested in the two selected leadership products? If so, were they more or less strongly evidenced in one in one product when compared to the other product? To find the answer to these question, I analyzed the information that I collected using the continuum-of-use and behavioral-event forms. The former elicited opinions and recollections from the 13 interviewees who were familiar, however tangentially, with the Center's leadership materials. Three were aware of the products but had not used them. One was aware of the products and had used one such product, but not the *Cases* or the *Simulation*. Four interviewees had used the *Cases* but not the *Simulation*; two had used the *Simulation* but not the *Cases*. Three

participants had used both the *Cases* and the *Simulation*, albeit one of those three had used a bundled version packaged as part of a more comprehensive program related to education reform. Of the 10 actual users of the research center's leadership products, nine had used one or both of the two selected products one or more times and *none* had voiced unfavorable overall opinions.

*Levels-of-use form.* The product-specific levels-of-use form framed the respondents' levels of involvement in a matrix that specified the product names--*Cases*, *Simulation*, and "Others"--as column headings across the top of the sheet, then listed the levels of involvement in the vertical column on the left: (a) scanning the content, (b) reading selected parts, (c) reading the entire document, (d) trying out in one or more settings, (e) continuing to use, (f) deciding not to use after trying out, (g) deciding to use after first choosing not to use, (h) recommending to someone else, and (i) lending to someone else. These levels of involvement depicted both linear and non-linear actions in the behavioral progression. The non-linear levels were lateral (recommending to someone else; lending to someone else) and looping (deciding not to use after trying out; choosing to use after first deciding not to use)--patterns that reflected the reality of prevailing practices and which have also been documented by numerous studies (Rogers, 1995).

*Behavioral event form.* By supplementing the levels-of-use form with a behavioral event form, I expanded the findings with nine interviewees' reflections about actual memorable occasions or events which they recalled as times when they had made particularly effective use of one of the selected products. Then I examined the

information generated by both forms and cross-examined it comparatively with that extracted from the participants' descriptions of the products' respective strengths and limitations. The comparative responses of the dual-product users were arguably more fertile than the single-product users' responses. However, the single-product users' responses were confirmatory and instructive of the dual-product users' assessments of each product's strengths and limitations. Accordingly, I have synthesized the paramount conclusions in the ensuing paragraphs.

*Attributes and product strengths.* Both the *Cases* and the *Simulation* were strengthened by their realistic, hands-on, practical, learn-by-doing approach to inculcating leadership concepts in vocational education administrators or aspiring leaders. Five responses accorded this strength to the *Cases*; an equal number accorded this strength to the *Simulation*. Those strengths issue from the *compatibility* attribute. Strengths that centered around efficacy of content were attributed to the *Cases* and the *Simulation* by two responses each. Cited for the *Cases* were functional questions and sufficient detail. The *Simulation* was described as having ample well-planned scenarios and plenty of jobs--characteristics embedded in the *relative advantage* and *compatibility* analogues.

*Complexity attribute inherent in Simulation.* The most instructive theme-groups were those comprised of several responses attributable to one of the products but not to the other. For example, one set of four responses which centered around flexibility and adaptability were accorded to the *Cases*, while the *Simulation* posted only one similar response. Equally insightful, the *Simulation* posted four corollary limitations--or lack of flexibility. This also supports the *complexity* analogue, the essence of which is that the

more complex a product is the slower and less broadly it will disseminate. Similarly, the theme of fun-and-enjoyable was central to three strength-responses attributable to the *Simulation*. No corollary thematic responses were cited for the *Cases*--but no off-setting limitations were cited either. The enjoyment theme issues from *relative advantage*, and *compatibility* attribute analogues as described by Rogers (1995).

The limitations named by the users were perhaps more insightful than the strengths in teasing out plausible reasons for the disparity between the sales of the two products. Especially instructive were the comparative opinions of three participants who had used both the *Cases* and the *Simulation*. One individual had found no limiting factors in the use of the *Cases*. On the other hand, all three interviewees cited *complexity*-attribute factors impeding the use of the *Simulation*. The conclusions were individually and mutually supportive of the notion that both the *Cases* and the *Simulation* manifested properties which were analogous to the generic *attributes-of-innovation* and impacted the dissemination process accordingly.

*Behavioral events linked to referent analogues.* According to Rogers (1995), the more complex an innovation is perceived to be, the less rapid and less broadly it will be disseminated among the targeted user population. Additional examination of the opinions and recollections elicited from the memorable events of users of one or both products, including field-testers and non-field-testers, revealed properties of each product analogous in nature and function to the other attributes on the Rogers' template--*trialability* and *observability*--thereby supporting his generalizations about them. Rogers (1995) postulated based on extensive research that *trialability* and *observability*



impacted dissemination. When potential adopters first tried out an innovation or at least observed an innovation being demonstrated, they were more likely to adopt it or not adopt it depending upon the favorable or unfavorable impressions formed during try-out or observed demonstration. The findings collected from the users of the *Cases* and the *Simulation* supported Rogers' research relative to the *trialability* and *observability* constructs. Field-testers and other early users who were favorably inclined toward a product after trying it out or observing it being tried-out, tended to continue using it and/or recommend it to others. To the extent that opinion leaders found the trial difficult to undertake or the results less than hoped for, they were less likely to continue using the product or to recommend it to others.

*Field-tester comparisons elucidate referent analogues.* By comparing the only *dual-user-Simulation*-field-tester's information with that provided by the two interviewees who had field-tested and used just the *Simulation*, I acquired additional insights supportive of Rogers' (1995) *complexity* attribute construct. Only one had continued to use the product enthusiastically without interruption; moreover, she was also a user, though not a field-tester, of the *Case Studies*. I therefore examined the different contexts surrounding the initial use of the *Breakers Simulation*, as conveyed in the behavioral events of the three *Simulation* field-testers, two *Simulation*-only users and one dual-user. First, the field-tester who had been the most enthusiastic and had continued using the product without interruption had conducted her initial simulation under the direction and guidance of Curt Finch, the author of the product. She had also been the only dual-user. Second, the field-tester who had chosen not to use the product after the initial *trial* but

who had subsequently opted to use it again, had conducted his initial *Simulation* activity under the guidance of a graduate research assistant who had worked for Curt Finch. The field tester who had not used the product subsequent to the *trial*-use had been in touch by phone with Curt Finch once or twice but had administered the *Simulation* largely without assistance or guidance from anyone at the Center. I therefore posit that if the author or some equally credentialed and enthusiastic surrogate personally provides on-site guidance and direction during the field-tests of product innovations with complex administration guidelines like the *Breakers Simulation*, then subsequent use and broader dissemination are more likely to result.

#### *Perusing the Product Profiles*

##### *Additional Findings*

Albeit the findings thus far have sufficiently explicated the research questions as designed, I decided to peruse once again the products' profiles as found in the Center's (1996) catalogue of products, to ascertain if other impacting factors were noticeable. Three surfaced--two of which may have impacted the disparity between the sales of the two products. Both issued from the values and needs dimensions of the *compatibility* attribute.

*Cost differences.* First, the cost of the *Breakers Simulation* (\$33.50) was more than double that of the *Leadership Case Studies* (\$15.00). Prior to interviewing the participants in this study, I had discounted cost as a potential dissemination-impacting factor for National Center products. Because NCRVE materials were marketed on a cost-recovery basis for a non-profit enterprise, I had

assumed a built-in *relative advantage* over for-profit competing products. The information derived from the subsequent interviews refuted my initial premise, since as previously described, users and non-users indicated that cost was indeed a factor--even for NCRVE products. Thus, one could argue that a cost differential of a 2:1 magnitude between the two products would likely have caused some to select the *Cases* instead of *Simulation*, or to select just the *Cases* rather than both, even if they could have used both.

*Platform differences.* Second, the *Simulation's* design of a technical college setting to serve as a platform for leadership development may have led some people to believe that the simulation was only designed for that group. As such the leaders being prepared for that kind of position were less numerous than for the broader array of leadership positions that encompass vocational administration directors in comprehensive high schools, in free-standing secondary vocation-technical schools, and in regional adult education programs as well as community colleges. The *Cases* had case-studies that spanned this broader array of leadership positions and settings. Thus, the content of both products were audience-appropriate (*compatibility* attribute), but the audience for each may have been perceived to be different.

I further wondered to what extent technical college presidents or aspiring trainees had participated in the *Breakers Simulation* during their tenure or prior to assuming that post. Although I found a roster of technical colleges on the internet and e-mailed an inquiry as indicated to one batch of 50 names, my efforts were

rewarded with sundry error messages and no responses. Perhaps NCRVE can undertake such a communication with success.

*Product-name connotations.* I suspect, based on Rogers' (1995) finding about the importance of a product's name, that two parts of the title for the *Simulation* may have negatively impacted its dissemination. First, the term *vocational education* connotes a curriculum less intellectually rigorous than a college preparatory curriculum. Thus, technical and community college professionals, whose institutions must struggle to have their course credits transferable may not be eager to use materials directed to vocational education leaders. Second, the term *Breakers*, an appropriate name in the context of an ocean-front college, was misconstrued by one interviewee as meaning those short interruptions during otherwise long workshops and seminars, when the speaker uses anecdotes or humor to gain the attention of the audience or as a bridge between two segments of the presentation. Others may have similarly mistaken the meaning for something other than the name of a hypothetical technical college.

#### *Significance of the Conclusions*

With the above conclusions adding to the previous ones posited relative to the challenges explored in this investigation, I argue that the main attributes of the *Cases* and the *Simulation* as unfolded in this study were analogous conceptually and functionally to those generic attributes found in the Rogers diffusion-of-innovation model. Moreover, the accrued findings have yielded valuable, supportive insights into the extent of product dissemination, the roles of product

attributes, and the nature and meaning of the inverse slope and the patterned disparity between the two product-sales totals.

## Implications for Practice

### *Dissemination Strategies*

How can education research centers utilize these findings and comments in the context of dissemination strategies? First, the value of electronic dissemination of leadership products offers immense potential in view of the number of interviewees who mentioned using it in response to this or other questions. Moreover, the extraordinary increase in usage of the internet has been well-documented by the National Center's dissemination staff. For example, in the winter, 1997 issue of *Centerwork*, David Carlson, NCRVE's manager of electronic communications for NCRVE's Dissemination Program, discussed the Center's increased number of Web site links as well as increased interest in and use of its two listserv discussion groups: VOCNET (for all vocational education related topics, and DISSMN8 (for educational dissemination-related topics). Subscribership was up on both, 7 percent and 14 percent, respectively. In addition, the Center placed on-line two periodicals (*Centerwork* and *CenterFocus*), one new product in its entirety, and nine executive summaries of recent NCRVE publications (Carlson, 1997). Although in the process of preparing this study, I incurred numerous error messages and stalled navigators as I attempted to e-mail individuals and to access sundry networks, I suspect such obstacles will soon be overcome. As e-mail becomes more dependable, as world-wide-web information sites become better organized and easier to find, and as both become more user friendly, opinion leaders and seekers of

innovative leadership products will increasingly turn to the Web for current information and innovative materials.

Second, the value of the Web for disseminating leadership and other products can be maximized if the change agencies' information management teams track and log all inquiries and arrange for sundry sorts by products and product categories; by inquirer names, organizations, and specialty; and by other relevant information as may appear to be valuable if, when accumulated and graphed over time, a trend may be observed. In addition, bundling and storing massive lists of potential users at the very lowest level of user, and e-mailing information about new products to them, would likely hit opinion leaders in the student- or aspiring leader-populations, generating requests and ideas upward from them to their respective personnel development specialists to find out more about the innovation. Thus the "push" of mass media could result in a "pull" from some individuals who feel the push and sense that "aha!" feeling of enlightenment upon recognizing an innovative solution or benefit not contemplated heretofore.

#### *Improving Dissemination of Innovative Products*

Building upon the knowledge generated from this limited study of leadership products, educational research and development centers may wish to reexamine their marketing strategies and product designs, with an eye toward improving market penetration and use of its multiplicity of well-researched implementable products.

#### *Mass Media*

One strategy suggested by the study would be to use more "mass media"

communication channels at the beginning of the dissemination process. Many clusters of opinion leaders who could influence later users tend to have connections with potential users or idea generators from a variety of disciplines--communications, business, management science, technology, liberal arts, international studies, education and education-for-work--in addition to connections with such professionals from multiple public and private domains--taxpayers organizations, policy think-tanks, elected officials, and charitable and religious groups. Such "cosmopolite" (Rogers, 1995) connections can enrich the perspectives of the researchers and garner ideas for better designing and publicizing well-researched, conceptually-sound innovative materials.

### *Field-Testing*

Another dissemination strategy currently being used is field-testing. The conclusions of this study underscore the importance of field-testing especially for products with complex designs. If the field-testers are enthusiastic presenters, are individuals whose opinions are highly respected in the field, are trained by the authors or their designated highly knowledgeable and enthusiastic protégés, and have frequent on-going communications with their trainers, then the products will tend to disseminate more rapidly and penetrate more broadly.

### *Product Design and Packaging*

#### *Sizzle or Substance?*

A related challenge is to develop products that not only are fully disseminated through the applicable mass media channels, but are also sufficiently distinctive to engrave the memories of those whose organizations may not manifest a need presently,



but would benefit from the products in the future if a need becomes evident. This challenge is central to Rogers' (1995) attributes-of-innovation construct. Ultimately, product designs must be sufficiently bold to stand out from the competition. Unless the products can catch the attention of "scanners" and are bold enough to be archived in their memories--even when the need is not perceived--the products will not enjoy maximum penetration. Consequently, their benefit to society in general and their value to taxpayers more specifically, will not be maximized. In the past I viewed such terms as *market penetration* as anathema to the revered scholarly tradition of offering *substance* rather than *sizzle*. I and other professionals argued that promotions and packaging necessary to add the *sizzle* components were too costly, especially for non-profit organizations.

#### *Both Sizzle and Substance Needed*

I am now dissuaded of such notions. Instead, I argue (a) that distinctive, compelling designs and promotions are frequently necessary for maximizing product-awareness during the initial (*awareness*) stage of dissemination; and (b) that solid substance must follow, in the form of content which meets expectations of the users--up-to-date, practical, well-grounded in theory, flexible, interactive, adaptable to a variety of presentation formats, and imbued with user-desired properties. The nature and function of such properties would be comparable to those in this study which issued from one or more of Rogers' attributes-of-innovations template. Both *sizzle* and *substance* are necessary to maximize use by opinion leaders who would then accelerate the point of critical mass, beyond which the full dissemination and use by a majority of members in the targeted social system would likely follow.

Finally, I submit that producers of tax-payer funded innovations are creative enough to develop stellar attention-getting designs and promotional literature that can be just as effective and much less costly than comparable private-market endeavors. One interviewee underscored the argument when he explained that his university had its own in-house graphics and other "pizazz-adding" components. If all research centers and sponsoring universities collaborated--not just inter-organizationally, but also inter-departmentally within the sponsoring institutions' communications, business, and advertising departments--a wealth of talent and resources would likely unfold. Interdisciplinary collaboration projects provide fertile ground for cultivating "outside-the-box" thinking to tackle difficult problems. For example, advertising students frequently develop promotions to fulfill course requirements. Such requirements could be fulfilled by naming and promoting innovative educational products--potentially a beneficial arrangement for all concerned.

### Implications for Future Research

#### *Comprehensive Studies May Expand Model Constructs*

#### *Building Data-Base for Testing Sigmoidal Diffusion Construct*

Building on this study, future research can expand to more comprehensive investigations of numerous constructs explicated here. For instance, the *sigmoidal distribution* construct could be used to frame a wide variety of educational innovations that have been disseminated. Once a system for adequately recording pertinent information about all queries is in place, such information can be tabulated, sorted and

statistically analyzed to generate important trends and variances--information critical to education change agencies. Moreover, statistical number-crunchers would likely tease out heretofore unnoticed relationships among variables. Such analyses could, for example, further inform what I now surmise--that the professional homogeneity of the participants involved in the current study may have been a factor in the products' inverse conformity with the S-shaped distribution curve.

### *Testing Product Names*

Another challenging research arena, emanating from Rogers' (1995) compatibility attribute is the importance of the "name" of a product as a factor that positively or negatively influences acceptance. Although my findings suggested that attaching the term "vocational" to the leadership products may have negatively influenced their dissemination, the profession would benefit from a more carefully designed, controlled study. I envision, for example, disseminating a single product with two different titles--one with the term "vocational" and the other "workplace" or a comparable alternative. The promotional literature would be similarly divided and used to publicize the products simultaneously through the channels of communication to the same targeted audiences. I suspect that the title without "vocational" would disseminate more rapidly and penetrate more broadly the target market parameters. Moreover, in this era of emphasis on academics and on integrating vocational education with academics, a name with components that connote both intellectual rigor and contextualized learning would tend to grab the attention of academic as well as vocational-technical professionals. Hence, the pool of potentially interested persons would be increased to include numerous academic

professionals, some of whom would likely investigate further and become more amenable to changes such as integration. I contend that such academics, outside the education-for-work arena, would eventually understand, embrace, and value highly the new dimensions of learning that unfold when abstract academic concepts in math, science, and the humanities, are depicted and explained in dynamic, contemporary, real-life and real-workplace contexts.

*Rethinking Product Designs and Dissemination Strategies*

Just as industries are restructuring their operations in order to produce products that reflect customer-driven quality, tastes, and values, so can educational research and development centers rethink their dissemination practices. How can these centers bring about more profound, positive changes in education? They can do so in part by designing products and shaping dissemination strategies that will increase the purchase and application of well-researched, pilot-tested educational innovations. The findings from this investigation will facilitate such endeavors. Future research analysts can similarly compare and contrast sundry parallel aspects of the Rogers model with aspects of educational dissemination strategies--past, present, or proposed. Results from such research will lead change agencies to predict better, to diffuse broader, and to, perhaps, reduce dramatically rather than incrementally the time it takes to transform research knowledge *accrued* into research knowledge *applied*. Such transformations will enhance--for learners as well as taxpayers--the value of research-based educational innovations, designed and disseminated through public-funded research centers.



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**APPENDIX A**

**Sample Cover Letter**

**and**

**Telephone Interview Instrument**



APPENDIX A

FAX TO [number]  
Phone: [number]

MEMO TO: name and title  
name of school or agency  
department name  
street  
city , state and zip code

DATE: 3/31/97

From: Gayle A. Lewis for Curtis R. Finch  
NCRVE/VA Tech Site

Subject: Research Project : Leadership Materials

Thank you for agreeing to share with us information regarding your knowledge of and involvement with NCRVE leadership materials. The information you provide will be valuable as we prepare future materials.

I am faxing you the list of questions which I will be asking, thus allowing you time to reflect on them prior to our scheduled tape-recorded interview [date and time as agreed on during preliminary phone conversation] The interview will last from 20-40 minutes. Confidentiality will be maintained of course.

Please share these with others who have used either of these products, and ask them to call me if they would be willing to participate.

I thank you again for participating in this study. I'll be happy to return the favor should you ever need my opinions or insights.

Sincerely

Gayle A. Lewis (540)783-4273  
e-mail: ggalewis@hotmail.com fax: (540)783-5279

## APPENDIX A

### Semi-Structured Telephone Interview Instrument

Questions 1-12 are generic in nature.

1. Hypothetically, if you are not in the market for leadership development materials at a given time, do you still manage to learn about innovative materials currently available or in the pipeline? If so, how?
2. Suppose you were actively engaged in seeking innovative leadership materials to meet a specific need. First, describe how you would undertake and conduct a search to ascertain what materials are available to choose from. Second, what key criteria would you use to rank the value of competing products?
3. If you were pushed for time or confused about which of several products would work best, whom would you most trust to provide you with candid critiques and advice? (Someone of well-deserved reputation who stays abreast of most leadership innovations and whose assessment is generally regarded as on-the-mark)
4. In reviewing a new leadership development publication or program, what are three or more required features that you feel must be demonstrated or shown, in order for you to contemplate purchasing or recommending the product?
5. Even if the product had the designated required features, is there anything that, if noted during your review, would cause you to reject or not recommend it, despite its positive qualities?
6. Describe organization structures or work environments which you feel would, if evidenced, tend to spur (1) timely dissemination of innovations to key personnel and (2) effective and creative adoption of important innovations by users who are charged with preparing education leaders.
7. Describe organizational structures or work environments that you feel would, if manifested, tend to delay or impede effective and timely dissemination and adoption of important innovations.
8. Describe your own involvement in professional organizations, civic clubs, or independent networking pursuits that you feel have enhanced your effectiveness and your ability to stay abreast of innovations in the field.
9. Describe any impediments you have encountered that may have hampered your ability to learn about, evaluate, and adopt innovative leadership development materials.
10. Can you suggest additional methods of designing, marketing, or disseminating NCRVE leadership products that could increase their scope of awareness and use among relevant professionals in the field?
11. Describe the purchase-order approval process that you must follow to select and purchase needed instructional materials. (as detailed as possible).

Appendix A—continued

12. What is your present position? What are your primary duties in that position?

How long have you held your present position?

How long have you been with your present organization?

Questions 13-15 relate to NCRVE leadership development products.

13. How did you learn about NCRVE's leadership products and what were your initial impressions?

14. To what extent are you familiar with the Leadership Case Studies and/or the Breakers Simulation? Describe your use and/or your knowledge of others' use of these or other NCRVE leadership products. [Use attachments A & B for answering this question]

15. In your opinion, what were the strengths and limitations of the products?

(a) Leadership Case Studies

(1) Strengths

(2) Limitations

(b) Breakers Simulation

(1) Strengths

(2) Limitations

(c) Others (Name)

(1) Strengths

(2) Limitations



**Appendix A-continued--Item 14-Attachment A**

To what extent has your involvement included the following? Check all appropriate and elaborate as needed.

**Breakers Simulation**

**Case Studies**

**Others  
Name &  
MDS # if  
available**

**Scanning  
the content?**

---

**Reading Selected  
Parts? If yes,  
what parts?**

---

**Reading entire  
document(s)?**

---

**Trying out  
in one or  
more settings?  
What settings?**

---

**Continuing  
to use?**

---

**Deciding  
not to use after  
trying out? Why?**

---

**Deciding to use  
after first deciding  
not to use? Why?**

---

**Recommending  
to someone else?**

---

**Loaning to  
someone else?**

---

**Appendix A continued--Item 14-Attachment B**

**If you have used the product(s) in some ways, I WANT YOU TO THINK OF A TIME WHEN YOU FEEL YOU MADE PARTICULARLY EFFECTIVE USE OF THE MATERIALS. This would be a time when you felt like you accomplished something; a time when you felt particularly good about what HAPPENED. Complete for each product that you have used more than once, if applicable.**

**1. The product used?**

**EXAMPLES**

**BEHAVIOR**

**THOUGHT/FELT**

(specific)

(what done, why)

(you/others)  
think, feel)

---

**2. Who was involved and How?**

---

**3. What led up to the use?**

---

**4. Describe the use.**

---

**5. What happened?**

---

**6. How did everything turn out?**

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**APPENDIX B**

**Letter Verifying Transcript Accuracy**

## **APPENDIX B**

### **Letter Verifying Transcript Accuracy**

**APPENDIX C**

**Generic Questionnaire Section**

**Interviewees' Desired Attributes**

**(Similar themes designated by same letters--not sorted)**

## APPENDIX C

### Interviewees' Desired Attributes

(Hanging top-line number and upper case letter designations are interviewee identification and levels of use codes. Lower case letters in parentheses designate themes. Repeated lower-case letters in parentheses indicate similar themes; asterisks indicate attribute(s) considered most important by the respective interviewees.)

4A NC--(a) application of theory \*(f) research base\* (q) written objectives at front at the beginning and summaries at the end.

5A NC--(b) how well it fit my clients' or students' needs\*(r) quick delivery (g)give information about users that I could speak with.(l) cost (i) field-tested.

3B C-UO-NU--(b) appropriate content (k) easy to use--not so big and bulky or too comprehensive; (b) adaptable to my local purpose or situation;\* (c) current content, (o) alternative delivery strategies--students don't have time to wade through books; at the graduate level they already have basic philosophical foundation, (l) cost (r) accessibility.

3A C-CO-UCS--(a) applicability (b) relevancy\*(c) currency.

\*"Students must see the connection between the content of the materials and the situations they are being prepared to confront as they assume leadership roles in education at any level."

8B C-CO-UCS--(b) fit my use and purpose\* (d) author's credentials (e) trial copy available.

5B C-FO-UC--(a)practical (c) current (f) sound theoretical model\* (g)user testimonials.

6B C-FO-UC--(b) concepts meshed with my purpose (h) interactive design (i) accurate concepts, field-tested.\*

8A C-FO-UC--(b) compatible philosophy\* (k) ease of use (l) reasonable cost.

9B C-FO-UC--(g) solid evidence of successful use and change resulting\* (b) compatibility with how I'm going to use it.

Appendix C--continued

9A C-FO-US--(a) applicable concepts (h) activities that physically engage students to reinforce learning.

7A C-FO-US--(a) practical, usable (b) audience appropriate (for me public rather than business sector oriented.) (k) ease of use--user friendly (n) not too long (l) reasonable cost.

10A C-FO-UCS1--(f) research base\* (g) user testimonials (i) field-tested (b) adaptability to my needs (m) availability of support materials (n) aesthetics--including organization and layout.

7B CR-FO-NU--(b) adaptability to my purpose and objective\* (k) ease of use (l) reasonable cost (n) bullets rather than narratives (o) distinctive, innovative, not "same old stuff."

4B CS-FO-MU--(b) closeness to my skills, attitudes, knowledge objectives\* (k) easy to use (l) reasonable price (p) plenty of visuals.

6A SC-NO-NU--(c) currency--up-to-date concepts and terminology (f) principle-based; theoretically sound (h) highly interactive.

**APPENDIX D**

**Generic Questionnaire Section**

**THEMATIC SETS OF DESIRED ATTRIBUTES NAMED BY INTERVIEWEES—**

**(grouped alphabetically from those identified in Appendix C)**



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## Appendix D

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### THEMATIC SETS OF DESIRED ATTRIBUTES NAMED BY INTERVIEWEES-- (grouped alphabetically from those identified in Appendix C)

4A NC	(a) application of theory *
3A C-CO-UCS	(a) applicability
5B C-FO-UC	(a) practical
9A C-FO-US	(a) applicable concepts.
7A C-FO-US	(a) practical, usable
5A NC	(b) how well it fit my clients' or students' needs*
3B C-UO-NU	(b) appropriate content -- adaptable to my local purpose or situation;*
3A C-CO-UCS	(b) relevancy to student needs Students must see the connection between the content of the materials and the situations they are being prepared to confront as they assume leadership roles in education at any level.*
8B C-CO-UCS	(b) fit my use and purpose*
6B C-FO-UC	(b) concepts meshed with my purpose
9B C-FO-UC	(b) compatibility with how I'm going to use it.
7A C-FO-US	(b) audience appropriate (for me public rather than business sector oriented.)
10A C-FO-UCS1	(b) adaptability to my needs
7B CR-FO-NU	(b) adaptability to my purpose and objective*
4B CS-FO-MU	(b) closeness to my skills, attitudes, knowledge objectives;*
8A C-FO-UC	(b) compatible philosophy
3A C-CO-UCS	(c) currency
6A SC-NO-NU	(c) currency--up-to-date concepts and terminology
3B C-UO-NU	(c) current content
5B C-FO-UC	(c) current
8B C-CO-UCS	(d) author's credentials
8B C-CO-UCS	(e) trial copy available
4A NC	(f) research base*
5B C-FO-UC	(f) sound theoretical model*
10A C-FO-UCS1	(f) research base*
6A SC-NO-NU	(f) principle-based; theoretically sound
6B C-FO-UC	(f) sound, accurate conceptual base.*
5A NC	(g) give information about users that I could speak with.
5B C-FO-UC	(g) user testimonials
10A C-FO-UCS1	(g) user testimonials
9B C-FO-UC	(g) solid evidence of successful use and change resulting*
6A SC-NO-NU	(h) highly interactive
6B C-FO-UC	(h) interactive design

## Appendix D--continued

9A C-FO-US	(h)activities that heavily engage students in physical activities to reinforce learning.
10A C-FO-UCS1 5A NC 6B C-FO-UC	(i)field-tested (i)field-tested (i)field-tested*
8A C-FO-UC 7A C-FO-US 7B CR-FO-NU 4B CS-FO-MU 3B C-UO-NU	(k)ease of use (k)ease of use--user friendly. (k)ease of use (k) easy to use; (k)easy to use--not so big and bulky or too comprehensive;
5A NC 8A C-FO-UC 7A C-FO-US 7B CR-FO-NU 4B CS-FO-MU 3B C-UO-NU	(l)cost (l)reasonable cost (l) reasonable cost. (l) reasonable cost (l) reasonable price (l)cost
10A C-FO-UCS1	(m)availability of support materials
7A C-FO-US 10A C-FO-UCS1 7B CR-FO-NU	(n)not too long (n)aesthetics--including organization and layout. (n) bullets rather than narratives
7B CR-FO-NU 3B C-UO-NU	(o) distinctive, innovative, not "same old stuff." (o) alternative delivery strategies--students don't have time to wade through books; at the graduate level they already have basic philosophical foundation
4B CS-FO-MU	(p)plenty of visuals
4A NC	(q)written objectives at front at the beginning and summaries at the end.
3B C-UO-NU 5A NC	(r)accessibility, easy to get. (r) quick delivery

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**APPENDIX E**

**Generic Questionnaire Section**

**Reasons for Rejecting a Product**

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## Appendix E

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### Reasons for Rejecting a Product

*Item 5 responses--reasons identified by continuing the letters assigned from Appendix D*

If a feature listed here was also cited as an attribute in the *Appendix F* it is presented with the same letter designation preceded by a minus sign--i.e. (-*n*).

- 3A C-C0-UCS (s) if title doesn't show me something I need; (t) written on too low a level (-b)too structured for me to tailor it to my situation.
- 3B C-UO-NU (-n) Not too pedantic or academic in looks as well as content: i.e. not all words and paragraphs. "because of the kinds of people we are dealing with, they can thumb through materials or glance at charts while they are on their way to meetings. But if it's reading, you can't do that; learners today have home responsibilities and other things to do; so it has to be not only enticing, but quick and easy to understand. One picture is worth a thousand words."
- 4A NC (-b) if it didn't follow my leadership philosophy; i.e. I couldn't use something with a chapter about gender bias in my survey course. The kids would throw it out. Now if we had something like a three-ring binder and I could take out the gender bias chapter and use the rest, that would be okay. But I reject books with chapters that aren't congruent with this University.
- 4B CS-FO-MU (-l) cost too much
- 5A NC (-a) too theoretical; (-l) too pricey--I would hate to have my students spend \$70-\$100 on a book.
- 5B C-FO-UC (-b) if it didn't appeal to the students' needs and interests.
- 6A SC-NO-NU (-l) cost is a big one--even if you have all of the positive characteristics, universities do not have unlimited funds and neither do students.
- 6B C-FO-UC (-b) if it required too much adaptation; (-l)if the cost seemed exorbitant.
- 7A C-FO-US (-l) cost; the opposite of the attribute of reasonable cost--too costly.
- 7B CR-FO-NU (-c) If I noticed out-of-date or innacurate data;
- 8A C-FO-UC (u) If I had too many or too few students to use with the materials as directed.
- 8B C-CO-UCS None
- 9A C-FO-US (-b) if it lacked the personal or human perspective.
- 9B C-FO-UC None

10A C-FO-UCS1 (-n) poorly laid out

## **APPENDIX F**

### **Composite Table of Desired-Feature Themes**

**Synthesized from Appendixes D and E**

## Appendix F

Desired-Feature Response-Set Themes (Appendix D) and Their Corresponding Absence as Reasons for Rejection (Appendix G), Framed with Congruent Analogues on the Rogers Attributes-of-Innovation Template--Appendix F

Alphabetized Response Sets' Central Themes (Column 1) and the Number of Responses in Each Set (Column 2). Numbers following corresponding negative letters (Column 3) indicate absence of similar attribute as reason for rejection--named by respondents not included in Column 2. Synthesized from Appendix D and Appendix G. The remaining columns list the response sets' generic analogues on the Rogers template.

Column 1	c2	c3	c4	c5	c6	c7
(a) Practical application of theory.	5	(-a)1	compatibility/relative advantage			
(b) Audience and user appropriate materials.	11	(-b) 3	compatibility/relative Advantage	complexity (2 -b's)		
(c) Up-to-date, current content.	4	(-c) 1	compatibility/relative advantage			
(d) Solid author credentials.	1		compatibility/relative advantage			
(e) Trial copy available.	1		compatibility/relative advantage		trialability	observability
(f) Principle-based, theoretically sound research model.	5		compatibility/relative Advantage			
(g) Solid evidence of prior successful outcomes.	4		compatibility/relative Advantage			observability
(h) Interactivity--physical and intellectual engagement of students.	3		compatibility/relative Advantage			
(i) Field-tested.	3		compatibility/relative advantage			observability
(k) Ease of use and handling .	4		compatibility/relative advantage	complexity		
(l) Reasonable cost.	6	(-l) 2	compatibility/relative advantage			
(m) Availability of support materials.	1		compatibility/relative Advantage	complexity	trialability	
(n) Pleasing aesthetics--layout and length.	3		compatibility/relative Advantage	complexity		
(o) Distinctively different--in configuration and implementation.	2		compatibility/relative Advantage			

## Appendix F—continued

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(p) Plentiful visuals to illuminate verbal facts and concepts.	1	compatibility/relative advantage	complexity
(q) Content Clearly marked with prefacing objectives and concluding summary.		compatibility/relative advantage	
(r) Readily and quickly accessible	2	compatibility/relative advantage	

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**APPENDIX G**

**Product-Specific Questionnaire Items**

**Leadership Case Studies**

**Comparative Responses**

**from**

***Case Users Only***



## Appendix G

### LEADERSHIP CASE STUDIES--Responses to Question 14, Attachment A Comparative responses from four interviewees who used *Cases* but not *Simulation* (C=interviewee who used *Cases* but not *Simulation*)

	C1	C2	C3	C4
Scanning the content?	yes	yes	yes	yes
Reading Selected Parts? If yes, what parts?	yes	yes; general information; then scanned; all; carefully read pertinent ones	yes; several in 5 or 6 addition to the two used in my classes	yes; thoroughly
Reading entire document?	no	no--not carefully just those related to my topic	yes	no
Trying out in one or more settings? What settings?	yes HRD course	yes; 3 groups-- 1 seminar; 2 curriculum courses	yes, once small group setting	yes; administration of education-for-work course
Continuing to use?	no	yes	once	yes; when I teach the course
Decided not to use after trying out? Why?	yes; too school-specific	no only one or two cases not reused.	no longer teach leadership; If I ever do, will use material from Center for Creative Leadership, Choosing to Lead; generic; allows more views	no
Used after first deciding not to use? Why?	no	n/a	no	n/a
Recommended to others?	no	yes	no	yes
loaned to someone?	no	yes; one group of cases	no	yes

**APPENDIX H**

**Product-Specific Questionnaire Section**

**USERS OF BOTH SIMULATION AND CASE STUDIES**

**COMPARATIVE OPINIONS**

**(from question 15 on the interview instrument)**

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## Appendix H

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### USERS OF BOTH SIMULATIONS AND CASE STUDIES--COMPARATIVE OPINIONS

(from question 15 on the interview instrument)

(Single letters in parentheses indicate strengths; limitations are denoted by an italicized "l" preceding their corollary strengths-letters. Similar themes are denoted by them same letter).

	strengths	limitations
1C CO UCS		
Cases	(a) broad-based; (b)flexible	( <i>la</i> )lacks depth of context
Simulation	(c)provides hands-on experience with problem situations confronting leaders in community colleges	( <i>lb</i> )difficult to organize; so structured, it's hard to be creative.
2C CO UCS		
Cases	(c)realism; (d)questions that helped none focus thinking about the problems.	
Simulation	(c)very realistic; students learned to empathize; (e)fun and enjoyable	( <i>lb</i> )difficult to keep up with what is going on.
3C-CO-UCS1		
Cases	(c)practical; reflected situations that folks experienced in their actual workplaces	( <i>la</i> )some too minimalist to effectivelyillustrate the point.
Simulation	(c)people put into practice concepts learned in realistic situations (e)people enjoyed it.	( <i>lb</i> )not enough positions; instructions not comprehensive enough--didn't get some things organized.

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## **APPENDIX I**

### **Product-Specific Questionnaire Section**

#### **USERS OF SIMULATION *NOT* CASE STUDIES**



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## Appendix I

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### USERS OF SIMULATION *NOT* CASE STUDIES

(Themes repeated from *Appendix H* are assigned the same letters. New themes are denoted by continuing from the last letter used in *Appendix H*. Thus *(f)* and *(g)* denote new themes. As in *Appendix H*, single letters in parentheses indicate strengths; limitations are denoted by an italicized "l" preceding their corollary strengths-letters. Similar themes are denoted by the same letter).

	_____ strengths _____	_____ limitations _____
1C-FO-US	(c)very realistic situations; (b)way it is structured it is easy to administer (f)not too time-consuming	(la)doesn't work well with experienced administrators
2C-FO-US	(d)well-planned, well-developed multitude of different scenarios; (c)students made situations even more realistic to this state's practices (e)students enjoyed it enthusiastically; (d) plenty of jobs.	(le)not enough e-mail type situations (lg) just one emergency--one more would have been good.

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**APPENDIX J**

**Product-Specific Questionnaire Items**

**USERS OF CASE STUDIES *NOT* SIMULATION**

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## Appendix J

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### USERS OF CASE-STUDIES *NOT* SIMULATION

(Themes repeated from *Appendixes H* and *I*, are assigned the same letters. No new themes were noted. As in *Appendixes H* and *I*, single letters in parentheses indicate strengths; limitations are denoted by an italicized "l" preceding their corollary strengths-letters.)

1C-FO-UC	(c)good, realistic; (f)succinct (d)sufficiently detailed	(l)a)too school-based for many of the HRD students.
2C-FO-UC	(b)flexible; adapted to my needs	(l)b)too much change required
3C-FO-UC	(c)excellent topical issues; (b)flexible--could pull specific cases as needed to illustrate concept or current problem.	(l)a)none unless not being able to use all the cases.
4C-FO-UC	(c)realistic; (b)could pick and choose from best from many different concepts as needed; (f)short enough but not too short.	(l)d)general questions at end not very helpful. Teachers couldn't relate to them.

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**APPENDIX K**

**Product-Specific Questionnaire Section**

**STRENGTHS AND LIMITATIONS(*l*)**

**(All Users' Comments Grouped by Theme from Appendixes H, I, J)**

## Appendix K

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### STRENGTHS AND LIMITATIONS(I)

(All Users' Comments Grouped by Theme from Appendixes H, I, & J)

#### Cases

- (a) broad-based;  
(*la*)too school-based for many HRD students.
- (b)flexible
- (b)flexible--adaptable to my needs
- (b)flexible; could pull specific cases as needed to illustrate concept or current problem.
- (b)could pick and choose the best from many different concepts as needed  
(*lb*)too much change required.
- (c)realism
- (c)practical;reflected situations in actual work places.
- (c)good, realistic
- (c)excellent topical issues
- (c)realistic
  
- (d)questions that helped focus thinking about solutions to problem
- (d)sufficiently detailed  
(*ld*)general questions at end not very helpful; teachers couldn't relate.
- (e) [0 responses]
  
- (f)succinct
- (f)short enough but not too short

#### Simulation

- (a)[0 responses]  
(*la*)doesn't work well with experienced administrators.
- (b)designed for easy administering.  
(*lb*)difficult to organize;so structured--hard to be creative.  
(*lb*)difficult to keep up with what is going on.  
(*lb*)instructions not comprehensive enough; didn't get some things organized.  
(*lb*)didn't adapt well with experienced administrators.
- (c)provides hands-on experiences with problem situations in community colleges.
- (c)people put into practice real,learned concepts.
- (c)very realistic situations
- (c)very realistic; students learned to empathize.
- (c)students made situations even more like those in this state's practices.
- (d)well-planned, well-developed multitude of different scenarios
- (d)plenty of jobs  
(*ld*)not enough e-mail type situations.  
(*ld*)just one emergency one more would have been good.
- (e)students' remarks enthusiastic; revealed enjoyment of event.
- (e)people enjoyed it
- (e)fun and enjoyable
- (f)not too time-consuming.

## VITA

Gayle A. Lewis, a doctoral student and chief investigator in this study, is a seasoned human resource professional and educator, two careers which honed her interviewing, listening, and public speaking skills and cultivated her expertise in public relations/communications/editing, management training/development, and employee/student relations. More recently, she conducted research and performed related tasks for Research Associates, a for-profit grantwriting and management consultant firm specializing in research related to problems in education, homelessness, and substance abuse. While pursuing her studies at Virginia Tech, Mrs. Lewis worked as a graduate research assistant for two years. Her educational background includes an undergraduate degree in liberal arts with a double major in social science and English, a master's degree in English, and numerous undergraduate credits in business management and accounting which she earned during her teaching and parenting years as time permitted.

Born in Martinsville, Virginia, April 28, 1941, Mrs. Lewis has been married since June, 1995, to her current husband, Robert E. Lewis, an electrical engineer. They now live in Marion, Virginia. They have six grown children between them from previous marriages, and two grandchildren--all very dear even though distant. Empty-nested, armed with a Ph.D in vocational-technical education, and flanked by a warm and supportive husband, Mrs. Lewis hopes to seek new career challenges in educational consulting, research, and writing, perhaps with a home-office in Marion, Virginia and the ability to telecommute to clients worldwide.