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TEACHING AND LEARNING INNOVATIONS IN HIGHER EDUCATION:

FACULTY PERCEPTIONS OF SUSTAINABILITY

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Instructional Systems

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ABSTRACT

The purpose of this study is to describe the perceptions of faculty regarding the factors influencing the sustainability of teaching and learning innovations. Departments and colleges have implemented many new and innovative programs over the years. Some of these have been successful and others have failed (Levine, 1980; Simsek & Louis, 1994; Zaltman, Duncan, & Holbek, 1973). What appears to be neglected from the field of research are studies involving teaching and learning innovations that are adopted by individual faculty members. This lack of attention can have implications for universities, innovation support units, and faculty members who are trying to support, develop, and adopt sustainable teaching and learning innovations. This research is needed in order to better understand the crucial elements that are needed in order for an innovation to have a chance of sustaining once it is implemented. This qualitative multiple case study explores the perceptions of faculty innovators at The Pennsylvania State University regarding the sustainability of their teaching and learning innovations. The study uses a phenomenological framework in order to allow for an in-depth description of the perceptions and experiences of the faculty participants (Morse, 1994). The cases in the study are faculty-initiated course innovation projects sponsored by the Schreyer Institute for Innovation in Learning (an innovation support unit at Penn State) from the fall of 1997 until the spring of 1999. The study uses multiple sources of evidence including archival records, documents, surveys, interviews, physical artifacts, and direct

observation to enable triangulation of the data (Yin, 1994). The findings of this study suggest that perceptions of sustainability revolved around issues involving the organization, the role of their colleagues and students in the innovation process, and the faculty perceptions of themselves as innovators. While the results of this study are specific to their setting due to the nature of case study research, lessons learned from this context could provide valuable information to others involved in the innovation process. Since innovation can be a slow and complex process in which there is not always a sustainable outcome, the perceptions of the faculty in this study may serve to inform and help adapt innovative processes elsewhere.

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Chapter 1

INTRODUCTION

We are living in an age of continual change. Advances in technology and the existence of a global economy have been the driving forces. Email and the Internet have allowed us to communicate and share ideas across the world more easily and faster than ever before. New products, methods, and ideas have entered our lives on an almost daily basis. Businesses seem to have adapted overnight, but in education the road to innovation has been a slow process (Siegfried, 1995). Innovation has been talked about, planned for, and implemented in higher education (Collier, 1972); however, many innovations have not been sustainable.

In 1994, the Schreyer Institute for Innovation in Learning (hereafter referred to as the Institute) was established at The Pennsylvania State University. The Institute was charged with the task of changing undergraduate education so that future graduates would be better prepared to handle the new challenges that the global economy placed on its workforce. In order to address these challenges, the Institute adopted the mission of helping faculty move away from the common practice of primarily lecturing and instead, to transform their courses into innovative learning environments. Common components in these courses included team-based assignments, problems, and activities whereby students would become more involved in their learning through interactions with the

material and with other students. It was hoped that the transformation to these types of learning environments would not only enhance student learning, but also better prepare graduates to work in teams once they began their careers.

Over the past six years, the Institute has consulted with faculty on the design and/or assessment of teaching and learning innovations in more than 93 courses across the University's entire system. However, this is the first time a follow-up study has been undertaken to look at the sustainability of those innovation projects. The perceptions of those faculty members regarding the sustainability of their innovation projects are the subject of this study.

In this chapter, I will provide the reader with background information about the University and the Institute, the characteristics of the projects that are sponsored by the Institute, and the types of support given to the innovations being studied. A statement of the issue being investigated and the need for and significance of this study will follow the background information.

<u>Background</u>

The Pennsylvania State University is a land-grant research institution located in Pennsylvania. The University has an average enrollment of more than 80,000 students at 24 locations across the state. It has 11 colleges that combine to offer 160 baccalaureate

degree programs. Its main campus, University Park, enrolls approximately 40,000 students.

In 1994, the Schreyer Institute for Innovation in Learning became a permanent part of The Pennsylvania State University system. Staffed at the time by only a director and an administrative assistant, a steering team was put in place to aid in the selection of projects and to give the director advice on the future directions of the Institute. One of the first tasks of the steering team was to help with the identification of potential project faculty. A list of faculty who were apt to try new things in their courses was developed and those faculty members were contacted to see if they were interested in receiving support for their ideas. During the spring of 1995, this group of faculty became the first to have projects sponsored by the Institute. They were given monetary support for their project and funding for an undergraduate intern to help with the management of the collaborative learning teams in their courses. The director also met with them on a weekly basis in order to support them in their endeavors.

While these projects were going on, a formal call for proposals went out to solicit projects for the fall 1995 semester. The steering team reviewed the proposals in order to determine those that were aligned with the Institute's mission. Once the initial review took place, faculty whose proposals had made it to the second round were invited to a steering team meeting in order to formally present their idea. From these presentations, the final group of projects was selected. Initially, this group was to receive only monetary support and funding for an undergraduate intern; however, the director and the steering

team recognized that the innovations in each course would need to be evaluated. As a result, during the summer of 1995 an assessment team was put in place to give faculty support in the areas of evaluation of their innovations and assessment of student learning. All subsequent project faculty members would receive the services of an assessment consultant while their project received Institute support.

In the summer of 1997, an instructional design team was added to the permanent structure of the Institute. The addition of this new team came after the Director, the staff, and the Steering Team of the Institute realized that the research and teaching demands placed on faculty by the higher education system were too great to allow for well-designed and fully-developed innovations. The job of this team of consultants was to advise and assist faculty on the design and development of innovative changes to the teaching and learning methods in their courses.

Currently the Institute employs a staff of five full-time staff members along with several part-time employees, including graduate instructional design and assessment consultants, and undergraduate student interns. The Institute sponsors innovative teaching and learning projects that aim to change ordinary classes into active and collaborative learning environments. Staff members review incoming faculty proposals to determine those that are innovative - new to either the faculty member or the specific curricular area. An overarching characteristic of the projects sponsored includes innovations that change the delivery method of the entire course and are not simply add-on components to existing teaching methods. Most accepted projects are chosen on the basis of whether

they appear to be sustainable and whether they can be transferred to other courses. All accepted projects receive some monetary support to help cover the costs associated with the design, development, assessment, and implementation of the innovations. Instructional design and assessment consultants at the Institute collaborate with faculty for the duration of their projects so that final teaching and learning innovations incorporate the best theory-driven methods for enhancing student learning. The Institute also sponsors an undergraduate intern whose job is to work as part of the project team. These interns offer a student perspective on the innovative teaching and learning methods being developed and offer support to students in the courses once the innovation is underway.

Statement of the Problem

In order to study innovation, we must first define it. Levine (1980) describes innovation as "…new and different. Innovation combines the elements of reform and change; reform implying new and change implying different" (p. 3). Collier (1972) refers to innovation as "changes which are deliberately planned or adopted; they may not be new in an absolute sense but are perceived as new by members of the community to which they are introduced" (p. 8). Implicit in both of these definitions is the idea that innovation is relative to the context. An idea or method may have been used somewhere else, but since it is new to the current adopter it can once again be considered an innovation. If this is true in education, and educators are in fact benchmarking their

innovations against past practices, they why don't all innovations sustain? Specifically, are there lessons that could be learned from studying past innovations that might help future innovations be more sustainable?

Over the years, numerous studies have been conducted on innovations in higher education. To aid in the study of these changes, several models have been utilized to chart the innovation process from idea to eventual adoption (Hage & Aiken, 1970; Levine, 1980; Rogers, 1995). While each model differs in the name and number of the stages in the process, there is consistency among four underlying phases: "1) recognizing the need for change; 2) planning and formulating a means of satisfying the need; 3) initiating and implementing the plan; and 4) institutionalizing or terminating the new operating plan" (Levine, 1980, p. 7). However, most studies have focused only on the first three phases of the process, that is, the need recognition, planning, and implementation phases. The lack of attention to the fourth phase, institutionalization or termination, could stem from the fact that the innovation process is slow and complex. As a result, any innovation that reaches the implementation phase might be deemed a success by those who were directly involved in the process.

What seems to be neglected in the field of inquiry for higher education innovation is that all innovations must go through phase four: institutionalization or termination (Levine, 1980, p. 8). Institutionalization is achieved when an innovation is sustained over time and thus becomes embedded into the permanent structure of the subject of innovation (Curry, 1992). If this does not happen, the innovation is eventually

abandoned. The few studies conducted specifically on phase four have focused on the factors surrounding the institutionalization and termination of innovations at the *organizational* level (i.e., changes to academic programs and administrative units) instead of at the *course* level (Davis, Strand, Alexander, & Hussain, 1982; Levine, 1980; Simsek & Louis, 1994; Zaltman, Duncan, & Holbek, 1973). Consequently, there is an important need to conduct research on the institutionalization and termination of innovations at the course level in order to inform our deeper understanding of sustainability factors.

In the fall of 1998, the staff of the Institute began to take a critical look back on its history. It had supported 93 courses across 16 of the University's 24 campus locations and yet little was known about whether or not those innovation projects had sustained. Since the Institute was started under the premise that it would work to change the culture of undergraduate education, were there lessons that could be learned from studying what happened to past innovation projects once they were implemented and Institute support was withdrawn?

The intent of this case study is to provide insight into the perceptions of faculty regarding the sustainability of their innovations beyond the implementation phase. Specifically, this will involve the study of sponsored innovations from the fall of 1997 to the spring of 1999. This particular time period is selected because: (a) Projects sponsored prior to the fall of 1997 only included assessment consultations, and (b) during the spring of 1999, the Institute adopted a new method for working with projects and as a result those projects are still receiving support.

The Significance of the Study

A review of the literature has indicated that there are a limited number of studies focused on the area of sustainability of innovations. This study provides an opportunity for the reader to gain a better understanding of the sustainability issues with respect to teaching and learning innovations. All readers should be aware that even though the teaching and learning innovations presented in this study might be similar to those in other settings, the descriptions and perceptions of the faculty that surface as a result of this study are unique to their particular situation.

Summary

The question of whether sponsored teaching and learning innovation projects are sustaining is a lingering concern for the staff of the Institute. This case study looks to partially answer that question by bringing to light the perceptions of the faculty that were directly involved. This study should be of interest to anyone involved with teaching and learning innovations in higher education. Even though it is not intended to provide recommendations for sweeping changes to existing processes, any lessons learned from this context might provide valuable information to others involved in the innovation process. Since innovation can be a slow and complex process in which there is not always a sustainable outcome, the perceptions and stories of the faculty in this study may serve to inform the reader and help them adapt their own innovation processes.

Chapter 2

REVIEW OF THE LITERATURE

<u>Overview</u>

The purpose of this study is to describe the perceptions of faculty regarding the sustainability of teaching and learning innovations beyond the implementation phase. Specifically, this involves the study of teaching and learning innovations sponsored by the Schreyer Institute for Innovation in Learning from the fall of 1997 to the spring of 1999. In order to provide a contextual basis for this study, the review of the literature will present a detailed look at the term *innovation* - examining its meaning and developing a definition from which all of the innovations in this study can be based. Following the development of this definition, the phases of the innovation process (Levine, 1980) will be explored since all of the innovations in this study followed a similar process from idea to eventual implementation. Furthermore, since the main focus of this case study is on the sustainability of teaching and learning innovations beyond their implementation, the remainder of the chapter will detail the final phase of the innovation process: institutionalization or termination. This last section will provide the reader with a look at the theory as it relates to the institutionalization or termination process as well as a presentation of the studies that have been conducted on innovations at both the

organizational and course levels. The potential implications of the prior research on this study are discussed at the end of each presentation.

Innovation

This is a case study of innovations. The term innovation has been used frequently in education, but is often defined and described in many different ways. In this section, I will present the various definitions that have been used in the literature stemming from social change, organizational change, and educational change to describe the term innovation. From these various presentations, I will glean a definition so that both the reader and I will have a standard definition to use as a lens for viewing the innovations upon which this study is based.

Innovation Defined in Social Settings

Rogers (1995), defines innovation as:

an idea, practice or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is objectively new as measured by the lapse of time since its first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation (p. 11).

Rogers further goes on to clarify that innovation does not always mean new knowledge. In fact, Rogers thinks that an innovation can be knowledge, a persuasion, or a decision to adopt (p. 11). To illustrate his notion of innovation being new in relative terms, Rogers describes the idea of boiling water to sterilize it. While most would not think of this as an innovation, Rogers describes a situation in which the notion of boiling water is introduced to a Peruvian village. According to Rogers, this idea was an innovation to the Peruvians since it was a new idea to them.

Innovation Defined in Organizational Frameworks

When referring to changes in organizations, Zaltman and Duncan define innovation as "any idea, practice, or material artifact perceived to be new by the relevant unit of adoption. The innovation is the change object" (Zaltman & Duncan, 1977, p. 12). They give an example of this definition in action when describing the adoption of a computer-based management information system. In this example, even though the idea of a computer-based management system was not new, the system was considered an innovation since it had not been previously used in the organization that was adopting it. Daft and Becker describe organizational innovation as "the adoption of a new idea or behavior by an organization. Innovation is very similar to change but is distinguishable by the criterion of newness. Innovation is the adoption of something new; change is the adoption of something different" (Daft & Becker, 1978, p. 4). In a review of the definitions of innovation stemming from business organizations, Becker and Whisler

define innovation as something new in relation to the organization's technological environment. When thinking about innovation from a business standpoint, this means "research departments create or invent things that may lie unused for a long time. Later the inventing organization, or an entirely different one, may make first use of this thing. That first user, we believe, should properly be considered the innovator" (Becker & Whisler, 1967, p. 463). Shepard (1967) looks at innovations in organization as a learning process, such that the organization is innovating when they learn to do something they did not do before. Knight (1967), describes innovation as something that occurs as a result of the first or early adoption of a new change into an organization. As we can see from these definition and descriptions coming out of organizational frameworks, similar to the educational definitions, innovation involves a change that is new relative to the organization that is adopting that change.

Levine (1980) states, "innovation can be operationally defined as any departure from the traditional practices of an organization. As a result, the element of newness inherent in innovation is a relative phenomenon - what is new in one place is old in the next... Much of what we call innovation is in fact renovation, trying the ideas of the past once again" (Levine, 1980, p. 3-4). This definition stems from a case study conducted by Levine on the institutionalization or termination of 14 new colleges at the State University of New York. The study took place from August of 1974 to January of 1975 and it traces the development of the 14 colleges through the innovation process, paying

specific attention to the institutionalization or termination phase[1]. In this study, Levine used questionnaires, tests, interviews, observations, and documents to produce his results. Jones (1978), in his study of fiscal strategies that can be used to stimulate instructional innovation and change, compares innovation and change in the following way:

> [Innovation is] the attempt to teach an idea or use a method that has not been tried previously, or to employ an instructional mode that has not been attempted previously in the same context. Change in instruction can be defined as teaching in a mode that differs from methods currently employed in a particular context. Thus, innovation requires change but change is not necessarily innovative. Instituting a change in an instructional program can involve nothing more than returning to methods used previously in the same context. An innovation in instruction not only differs from the status quo but also has not been successfully implemented before in the same institutional context. The emphasis on context is intended to indicate, for example, that employing a method or idea in one discipline that has been used exclusively in another discipline is innovative. (p. 589)

This comparison provides a clear distinction between what is change and what is in fact, innovation. Hannan et al., describe innovation as "something new to a person, course, department, institution or higher education as a whole. An innovation in one situation

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[1] This process will be described later on in this chapter.

may be something established elsewhere, but the implication of these assumptions is that it is a departure from what has been done before" (Hannan, English, & Silver, 1999, p. 280). From these definitions we can assume, at least from an educational standpoint, that in order for a change to be considered an innovation, it must contain two fundamental notions: (a) it must have the perception of relative newness, and (b) this newness must be with respect to a change in the context from which the innovation stems.

Looking back, it would seem that regardless of whether we are considering innovation in terms of social change, organizational change or educational change, there is agreement on the basic premise that innovation is new relative to the setting in which is being tried. Therefore, from the above definitions and descriptions, it can be inferred that *innovation is any type of change that, although it may have been tried before in other settings, is new to the individual or group directly involved in the innovation process.* This is the definition that the reader of this study should keep in mind. The innovations in this case study all fit this definition. All of the changes that were made to the courses described in this study were new ideas or methods relative to both the setting in which they were applied and the faculty who initiated them.

The Phases of the Innovation Process

As stated in the Chapter One, there are four basic phases that every innovation must go through: "1) recognizing the need for change; 2) planning and formulating the means of satisfying the need; 3) initiating and implementing the plan; and 4)

institutionalizing or terminating the new operating plan" (Levine, 1980, p. 7). In this section, I will limit my focus to only the first three of the four phases. This is done to provide background knowledge of the phases that each one of the innovations in this case study went through while receiving support from the Institute. Since the fourth phase, institutionalization or termination, is the phase of particular interest to this study it will be discussed in detail later in this chapter.

Phase One: Recognizing the Need for Change

Levine's description of this phase stems from an organizational framework. He describes this phase as beginning when the "organization's norms, values, and goals require a comparable change in its boundaries" (Levine, 1980, p. 12). For Levine, norms are the standards by which people within an organization communicate, act, and interact. He describes values as the "commonly shared beliefs and sentiments held by the people in the organization" (p. 11). Finally, goals are the "commonly accepted purpose and direction of the organization" (p. 11). Therefore, when those within the organization perceive a change in the norms, values, and goals they recognize the need for change and thus, the innovation process begins.

Rogers (1995) looks at this phase of the process from a social change perspective. Rogers discusses this phase as beginning when an individual becomes knowledgeable about the innovation. He follows by discussing the notion that there is a debate about

whether this knowledge comes about as a result of a need or as a result of an awareness of an innovation. Rogers explains,

> A need is a state of dissatisfaction or frustration that occurs when one's desires outweighs one's actualities, when 'wants' outrun 'gets.' An individual may develop a need when he or she learns an innovation exists. Therefore innovation can lead to needs, as well as vice versa (Rogers, 1995, p. 164).

To illustrate this idea, Rogers points out that while the existence of a bug (need) might cause a farmer to seek out a new pesticide (innovation), the existence of the compact disk (innovation) might cause the consumer to seek out certain electronic products (need).

This idea of need recognition seems to hold true if we look at the literature on innovations in education as well. Enarson (1960) discusses the notion that there are four areas that will cause innovation to occur in education. These four areas include changes in the number of courses, changes in the course content and method, changes in class size, and changes in the use of faculty time. He further states that while faculty can at times be resistant to change, these changes in the educational organization can exert enough pressure as to cause the recognition of a need for change.

In a study conducted at 15 universities in the United Kingdom from 1997-1998, Hannan et al. (1999) interviewed 103 faculty members regarding their reasons for innovating. The reported results indicated that of the 103 faculty interviewed, 34 saw a need to improve student learning, 31 reported the need to respond to changes in student

demographics, 21 were motivated by a need to address the demands of external agencies, and 11 reported a need to adapt due to curriculum change or internal reorganization. Kozma (1985) describes the innovation process as beginning when there is "a decision made by groups or individuals in positions of authority in response to pressures external to the system" (p. 302). He further states "the introduction of something new into a system creates its own press for change" (Kozma, 1985, p. 303). Thus, there will be recognition of the need for change in education if some type of outside pressure forces those in positions of authority to look for alternative ways of conducting education. In this study, the faculty members who looked to support from the Institute for their innovations were responding to a need. At the start of this study, it was not known whether the innovation came about as a result of a need or the need to innovate was a response to knowledge of a new way to present their courses. This was is explored further in the study and is discussed in Chapter Four.

Phase Two: Planning and formulating the means of satisfying the need

According to Levine, this phase is one that can be undertaken by either individuals or groups of individuals. The main idea inherent in this phase is that whatever the solution, it is by definition not an innovation unless it is new to the individual or group where it is to eventually be implemented. Fullan maintains that regardless of the impetus to change, any innovation that is planned must be appropriate for the educational setting for which it is being planned (Fullan, 1991, p. 19). Fullan further describes cases

where innovations were planned because they either worked in other settings or would result in funding for the organization. In each of these cases, it was later discovered that these innovations didn't work because of a mismatch between the innovation and the intended setting.

Rogers describes this phase as the persuasion stage (Rogers, 1995, p. 167). He states that at the persuasion stage, "the individual (or some other decision-making unit) forms a favorable or unfavorable attitude toward the innovation" (Rogers, 1995, p. 167). It would seem that this is the stage whereby the individual or unit thinking of initiating the innovation will become more involved with what the innovation means, how it will fit into their situation, and what external messages they are receiving about the innovation. To Rogers, the outcome of the persuasion stage is ultimately the decision to go ahead with the adoption of it as a valid means of satisfying the recognized need or awareness. In summary, Levine and Fullan are in agreement that in order to be adopted, the innovation should be appropriate for the situation where it will be put in place. Rogers adds to this notion by reinforcing the idea that the individual adopting the innovation must be comfortable with the idea of its adoption.

The process described in the study undertaken here takes both appropriateness and faculty comfort with the innovation into consideration. During the planning phase, the curriculum and the demographics of the course were carefully analyzed in an attempt to make sure that the innovation was suitable for the course. Furthermore, the consultants on the team made every effort to determine if the innovation was a "good fit" for the faculty member adopting it.

Phase Three: Initiating and implementing the plan

Levine describes this phase as the trial phase. Operating under the assumption that the innovation being implemented has been carefully screened in phase two to make sure that it is appropriate, this phase involves the innovation being tested as a solution to the need. From the implementation standpoint, it is assumed that there might be some initial tweaking of the innovation during this phase in order to solve unanticipated problems but eventually the innovation will stabilize. Levine acknowledges that phase three has no specific length of time and it ends when the innovation either becomes part of or is rejected by the organization.

Rogers (1995) looks at this phase as happening in two stages: decision and implementation. In the decision stage, the individual ultimately decides to either adopt or reject the innovation. Like Levine, he also considers the decision stage to be a trial period whereby the innovation can be tested to determine its feasibility for satisfying the need and working in the setting to which it is being introduced. If this trial period lends itself to a decision to reject, then the innovation process is over. If the outcome of this trial period is adoption, then the implementation stage begins. At this stage the implementation is actually put into practice. Rogers acknowledges that during the implementation stage problems may arise that will cause the innovation to change from its intended state, but that this is normal. Finally, like Levine, Rogers indicates that there is no specified length to the implementation stage.

The innovations in this case study did go through a trial period while still receiving support from the Institute. During this trial period it was sometimes necessary to make minor changes to the innovation in order to solve problems that were not anticipated during the planning process. It is assumed that all of the innovations remained in this phase for a period of time once Institute support was withdrawn; however, at the start of the study there was no way of knowing how long this trial period lasted. This was explored more fully during the interview phase of the study.

As indicated previously, the discussion above has been limited to the first three phases of the innovation process to provide background knowledge of the phases that each one of the innovations in this case study went through while receiving support from the Institute. In the paragraphs that follow, the focus is specifically on phase four: institutionalization or termination, since it is the phase of particular interest to this study.

Phase Four: Institutionalization or Termination

Every innovation that achieves implementation must eventually achieve either institutionalization or termination. Levine describes institutionalization as the point in which an innovation loses its trial status and becomes accepted by the organizational structure (Levine, 1980). Likewise, when an innovation reaches the end of its trial status and is not accepted, it is terminated. There are four outcomes of the institutionalization or termination process: diffusion, enclaving, resocialization and termination (Levine, 1980, p. 15). Diffusion and enclaving result as part of the innovation process when the

organization expands its boundaries to include the innovation as part of its structure. In diffusion, the innovation spreads and in enclaving the innovation exists in isolation. Resocialization or termination result when the innovation does not fit the norms, values, and goals of the organization. As a result, the organization contracts its boundaries and the innovation ceases to exist. The innovative unit is forced to return to its pre-innovative state. Boundary expansion or contraction can be facilitated by whether the innovation is viewed as profitable or compatible.

In an unpublished case study involving two similar innovations at two similar institutions, Levine (1980) found that one achieved boundary expansion via diffusion and the other boundary contraction via termination (p. 15). A closer analysis of the two organizations with respect to the innovations found that the diffused innovation was viewed as both profitable and compatible while the terminated innovation was viewed as both unprofitable and incompatible. In further studies, findings revealed that compatibility tends to be supported less often than profitability.

However, there have been instances where profitability can lead to institutionalization via enclaving. In an ASHE-ERIC Higher Education Report, Curry (1992) describes a situation in which an innovative unit had been set up on the campus of a research university. This unit had gone through the phases of the innovation process, was satisfying a need, was considered to be appropriate for the setting, and had received support from the administration of the university. However, after the implementation phase was completed, the unit had in fact achieved boundary expansion via enclaving since it had proven to be profitable.

Ross (1976) conducted a study involving faculty and administrators at 115 liberal arts colleges in the United States on the organizational conditions associated with the institutionalization of new academic programs. This study consisted of interviews with administrators and questionnaires mailed to faculty members. Specifically, it looked at the institutionalization of programs in the "main line" disciplines of biophysics, linguistics, statistics, and computer science as well as programs in the smaller disciplines of urban and ethnic studies. Results indicated that the emergence of innovations in the main line disciplines is related to conditions whereby resources are available and there is dependence on size, growth rate, and tuition. In the "lesser disciplines", these findings held but only if there was also the presence of internal leadership and an authority structure to support the innovation. These findings seem to indicate that innovations at the organizational level are dependent on the conditions, the resources available, and the organizational structure and can vary from program to program. The implications that these findings hold for this research are that the sustainability of the teaching and learning innovations sponsored by the Institute could be dependent on the department or college affiliation, the amount of support from that affiliation, and the presence of funding.

Kozma (1978) conducted a study on the impact of faculty development on the adoption and diffusion of classroom innovations. In his study, faculty who were both supported by a faculty development unit and those who were not supported were given a questionnaire surrounding their use of different innovative instructional techniques. Results indicated that there was an increased use of innovations when a faculty development unit supported the faculty members. Furthermore, in a follow-up

questionnaire given eight months later, those faculty members who had received support were shown to be more likely to discuss their innovation with other colleagues. Kozma does indicate that there is need for further research in this area and that the amount of time between the initial questionnaire and the follow-up questionnaire may have had an impact on the results.

These results are applicable to this case study since the Institute is considered a faculty development unit and therefore, its support might have resulted in more discussions between colleagues surrounding the adoption of the innovations. This notion, as well as the faculty perceptions of its impact on sustainability was explored as part of this study.

Kozma (1985) reports on an earlier study that compared the impact of four instructional improvement projects. He states that a comparison of the outcomes of two of the programs, IMPACT and LOCI, is significant. Both programs were designed to promote instructional innovation using computerized, inquiry-based approaches to instruction and both funded faculty at major research institutions, state supported colleges, and private liberal arts colleges in a variety of disciplines. Kozma reports that the only difference between the two projects was the IMPACT support provided participants with technical information and workshops while LOCI only provided support when it was requested. Results indicated that three years after the projects began, IMPACT directors were more innovative and developed a greater variety of instructional technologies and techniques than the LOCI directors. However, in spite of this difference, LOCI directors were much more willing to label their projects as successful and to

disseminate the results to others. Kozma indicates that these differences were largely based on the different approaches to the innovation process. Specifically, the involvement of others in the original project decision to adopt the innovation correlated with the project success. The LOCI project had more group decisions in the process then the IMPACT project.

These results hold some value to the innovation projects in this case study. In all of the projects supported by the Institute, the faculty members are part of a project team. Any decisions on the innovations design and development were discussed with the design and assessment consultants and the decision to eventually adopt an instructional innovation was collaborative one.

In a follow-up study on the IMPACT and LOCI projects, Kozma (1985) used a grounded theory approach to develop factors that are critical to instructional innovations. In this study he combined the data collection methods of field interviews, telephone interviews, review of institutional catalogues, project proposals and final reports. Interviews were conducted with project directors, colleagues and other staff members as the institutions where the projects were taking place. Results from this study indicated that, (a) funding during the innovation process is critical in order to allow for release time to plan, develop, and implement the innovations; (b) proposals should be carefully reviewed prior to supporting the projects in order to better ensure the success of the innovation; (c) a collaborative process should be required by the funding agency; (d) support and leadership of the department chair is critical to the projects success, and (e)

agencies should promote the continual evaluation of the instruction so faculty members and department chairs can chart the innovation's instructional effectiveness.

Kozma's (1985) study does have implications for this research. The innovations in this case study all received funding during the innovation process and the Institute insisted that all of the projects be a collaborative effort between the faculty member and the consultants assigned to the projects. As part of the process, the assessment consultants at the Institute evaluated each project during the first implementation phase; however, whether this evaluation continued after the Institute support was withdrawn is unknown. Since the Institute did not require the involvement of the department chair or dean at the time of the projects, the faculty participants in this study were queried as to whether they had received this type of support. These findings are discussed in Chapters Four and Five.

Summary

This chapter has reviewed the literature on innovation and the innovation process. The term innovation was presented in a variety of contexts and a definition of *innovation* was developed in order to provide a framework from which all of the innovations in this study can be based. The theory behind the innovation process was presented with attention being focused on the final phase of the process: institutionalization or termination. This was done to better situate the phenomenon being studied in this research. Finally a review of studies surrounding the institutionalization or termination

phase of the innovation process was presented along with the implications that each holds

for the study to follow.

Chapter 3

RESEARCH METHODS

<u>Introduction</u>

This chapter describes the research methods used in this study. The following sections describe a rationale for using a qualitative research design and the theory behind the phenomenological framework that guides the study. Background information on the use of case study methodology to conduct the research, a disclosure of researcher identity, and the specific data collection methods that were used in this study will follow. The chapter concludes with a presentation of the methods that were used to analyze the data.

<u>Qualitative Research Design</u>

The intent of this study is to provide insight into the perceptions of faculty regarding the sustainability of teaching and learning innovations beyond the implementation phase. In order to uncover these faculty perceptions, the research was conducted from a constructivist perspective using qualitative research design methods. The constructivist perspective used is supported by qualitative research in that, "most contemporary qualitative researchers nourish the belief that knowledge is constructed rather than discovered" (Stake, 1995, p. 99). Furthermore, a "constructivist view encourages providing readers with good raw material for their own generalizing" (p.

102). Since any lessons learned from this research might provide valuable information to others involved in the innovation process, the constructivist paradigm will allow me the opportunity through the writing of case descriptions and the presentation of my findings to "assist readers in the construction of knowledge" (Stake, 2000, p. 442). Furthermore, the use of qualitative research methodology will provide the reader with a thick description of the faculty's perceptions of the phenomenon of sustainability of teaching and learning innovations (Stake, 1995, p. 102).

Phenomenological Framework

Qualitative research can be conducted using various frameworks. German philosopher Edmund Husserl was the first to use the label phenomenology as a framework for conducting research. According to Holstein and Gubrium (1994), Husserl believed that the "relationship between perception and its objects was not passive" (p. 263). This means that perception is not objective but that each individual seeks meaning from what he or she observes or experiences. In essence, a perceiver creates meaning. Applying this concept to research, Berg (1998) argues that phenomenology allows the researcher to "seek to discover naturally arising meanings among members of study populations" (p. 26). Given a phenomenological approach, the meaning of sustainability for instance is not predetermined by the research but is instead defined by the participants in the study. Morse (1994) discusses the notion that research conducted from a phenomenological framework will produce an in-depth description of the experience of a

process (Morse, 1994, p. 225). It is this type of rich description that this study seeks to provide.

The phenomenon under investigation here is the sustainability of innovations. Specifically, this study seeks to uncover the perceptions of faculty surrounding the sustainability of their particular teaching and learning innovations. While I have my own perceptions of what sustainability means[1], in this study I want the meaning to arise from the faculty participants whose experiences effect and are affected by the innovation process. Therefore, by using a phenomenological framework the reader is provided with an in-depth description of the perceptions and experiences of the faculty participants in order to gain a better understanding of their view of the sustainability of their innovations.

Case Study

"Case studies are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 1994, p. 1). This case study seeks to discover the factors inherent in this phenomenon of sustainability by uncovering the perceptions and experiences of the faculty who were directly involved with the teaching and learning innovations sponsored by the Institute from the fall of 1997 to the spring of 1999. Case study is chosen as a method in education when the "cases of interest include both people and programs examined for either their uniqueness

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[1] These are discussed in the Limitations of the Study later in this chapter.

or their commonality" (Berg, 1998, p. 212). Yin (1994) holistically defines case study research by looking at both its scope and its data collection and analysis strategies. For Yin:

> 1. A case study is an empirical inquiry that
>
> • investigates a contemporary phenomenon within its real-life context, especially when
>
> • the boundaries between phenomenon and context are not clearly evident.
>
> 2. The case study inquiry
>
> • copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
>
> • relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
>
> • benefits from the prior development of theoretical propositions to guide data collection and analysis (Yin, 1994, p. 13).

He follows by indicating that the two criteria are not mutually exclusive and thus, case studies are comprehensive research strategies.

The perceptions and experiences of the faculty participants that surfaced as a result of this study were unique to their particular situation. Each of the innovations in this study was situated in either a different college and/or department. None of the innovators involved in this study collaborated with each other in either the design or the implementation of their teaching and learning innovations. Therefore, there was a variety of variables discovered surrounding the sustainability of innovations. This study relied on

multiple sources of evidence. It used triangulation methods as the means of interpretation and drew upon the theory presented in Chapter 2 to not only provide a basis for the initial "how" and "why" questions, but also to help initially identify the trends and themes that might emerge during the analysis of the data.

The Cases

The cases for this study were the teaching and learning innovations sponsored by the Institute from the fall of 1997 to the spring of 1999. These cases were chosen for study for two reasons: (a) Since a review of the literature has indicated that there are a limited number of studies focused on this phenomenon, this study provides an opportunity for the reader to gain a better understanding of the sustainability issues with respect to teaching and learning innovations, and (b) since there have been no prior studies conducted on these innovations, this study provides an opportunity to uncover lessons that may help the Institute create more sustainable innovations in the future.

It is important to note that all of the teaching and learning innovations in this study were faculty-initiated. While the Institute did ultimately select the projects it would support on the basis of whether they held to the definition of innovation discussed in Chapter 1, all of the proposals received were submitted to the Institute as a result of a perceived need that the faculty had identified. All of the projects received design and/or assessment consultations whereby the proposed innovations were analyzed to make sure they were appropriate for the course where they were being introduced. Support for the

innovations continued through the last semester of implementation and after that time the Institute support was discontinued.

Data Collection

As previously mentioned, this study uses case study methodology (Yin, 1994). Moreover, it utilizes the methodology specific to collective case studies since the intent is to study a "number of cases jointly in order to inquire into the phenomenon" (Stake, 1994, p. 236). The multiples cases used to investigate the phenomenon in this study were the teaching and learning innovation projects sponsored by the Institute from the fall of 1997 to the spring of 1999.

Yin (1994) describes three principles that can be used to maximize the benefits of sources of evidence collected in a case study (p. 90). First, he recommends the use of multiple sources of evidence to allow "an investigator to address a broader range of historical, attitudinal, and behavioral issues" (Yin, 1994, p. 92). Further, "the most important advantage presented by using multiple sources of evidence is the development of converging lines of inquiry, a process of triangulation…" (Yin, 1994, p. 92). By using this method, the "potential problems of construct validity [can be addressed since] multiple sources of evidence can essentially provide multiple measures of the same phenomenon" (Yin, 1994, p. 92). The multiple sources of data collected in this study included archival records and documents, surveys and interviews, physical artifacts when available, and direct observation when it was possible. The second recommended principle is the creation of a case study database (Yin, 1994, p. 94). This database should

contain: (a) any case study notes from interviews, observations, and document analysis; (b) any case study documents that are collected during the course of study; (c) any tabular materials that can be used as documentation of the number of occurrences of various phenomena; and (d) any narratives that are written by the researcher citing evidence as to the occurrence of themes that emerge during the study. According to Yin (1994), "a case study database markedly increases the reliability of the entire case study" (p. 95). In this study, all of the information obtained was recorded into the appropriate elements of the case study database in order to facilitate the final analysis of data. The final principle is the maintenance of a chain of evidence (Yin, 1994, p. 98). This allows an external observer to "follow the derivation of any evidence from initial research questions to ultimate case study conclusions" (p. 98). This chain of evidence should be tied to the case study database in order to not only allow for cross-referencing of the methodological procedures, but also to aid in the writing of the case study results. This method, according to Yin (1994), will also "increase the reliability of the information in a case study" (p. 98). In this study, a chain of evidence was maintained throughout each phase of the data collection process.

The data used in this study were collected in two major phases. Phase 1 consisted of the selection of the teaching and learning innovation projects, identification of the faculty participants, and the administration of an initial survey as a means of finding out the status and background information surrounding the selected innovations. Phase 2 involved the review of project documents on file at the Institute, interviews with faculty

participants, observations of the innovations in action, and the review of physical artifacts such as syllabuses and assignments.

Phase 1

A database of all teaching and learning innovation projects that were sponsored by the Institute served as the starting point for selection of the potential cases and ultimately the faculty participants in the study. The timeframe for selection, fall of 1997 to spring of 1999, was chosen for two reasons: (a) Projects sponsored prior to the fall of 1997 only included assessment consultations, and (b) during the spring of 1999 the Institute adopted a new method for working with projects and as a result those projects are still receiving support. A first cut at the database yielded 46 different teaching and learning innovation projects sponsored during the indicated timeframe. The faculty members listed as lead faculty in the courses associated with those projects were then compared with the university directory in order to determine those who were still employed by the University. This comparison cut the original list down to 41 potential cases (28 faculty at University Park; 13 faculty at the other campuses) for the study.

Once the final list of potential cases was identified, a survey (Figure 3.1) was sent to all of the faculty members who initiated those teaching and learning innovations. According to Yin (1994), a survey is a type of instrument used as a means of gaining more insight into the phenomenon. In this study, the use of the survey served as a means of finding out the status of the innovations since there had been no contact with the faculty participants since Institute support was withdrawn.

Figure 3-1: Survey Instrument

Sustainability of Innovation in Higher Education Study
Survey

Code #:
Please answer each of the following questions with as much detail as possible. All responses
will be kept confidential. (You may attach additional sheets if necessary.)

1. What were your reasons for initially deciding to make changes to the teaching and learning
   methods in your course? (check all that apply)
   _____ Need to improve student learning
   _____ In response to changes in the curriculum
   _____ In response to a reorganization of the course
   _____ Other (please specify)
2. What type of support did you receive from the Schreyer Institute for your innovation?
   (check all that apply)
   _____ Assessment Consultations
   _____ Instructional Design Consultations
   _____ Funding
   _____ Other (please specify)
3. Which of the following statements best describes the current status of the innovation?
   _____ I am still teaching the course and I am still using the innovation.
   _____ I am still teaching the course but I am no longer using the innovation.
   _____ I am no longer teaching the course, but the innovation is still being used in the
   course.
   _____ I am no longer teaching the course and the innovation is no longer continuing in the
   course.
   _____ I am no longer teaching the course, but I am using the innovation in other courses I
   teach.
   _____ I am no longer teaching the course and I do not know if the innovation is still being
   used in the course.
4. As a result of this innovation, have you made changes to other courses that you teach?
5. Have other faculty members in your department/unit asked you to consult with them on
   changes to their courses?
6. At the time of your project, had you received tenure from Penn State?
7. Did you receive support for your project from your department/unit head? If so, what type
   of support was offered?
8. Did you receive support for your project from your college's dean? If so, what type of
   support was offered?
9. If you are currently teaching the course and are still using the innovation, what has helped
   you continue the innovation?
10. If you currently teaching the course but are no longer using the innovation, what caused
    you to abandon the innovation?

Shading indicates choices related to sustainability.

Survey questions were chosen based on the literature surrounding the innovation process (e.g., Fullan, 1991; Hannan et al., 1999; Levine, 1980; Rogers, 1995). Specifically, question 1 was included in order to find out more information surrounding phase one of the innovation process: recognizing the need. Questions 2, 7, and 8 were used in order to obtain cursory information about whether the innovation might have fit within the norms, goals, and values of the system (i.e., department and/or college) and also to determine whether it was initially supported during its "trial period" (Levine, 1980, p. 13). Questions 4 and 5 were chosen as a means for finding out initial information on whether the innovation diffused to other courses. Question 6 was included in order to determine the faculty member's rank at the time of their project. Finally, questions 3, 9 and 10 were used to determine whether the innovation was sustaining or had been abandoned as well as a means of gleaning some initial perceptions as to what contributed to the innovation's eventual outcome.

Initially, the responses to the survey were analyzed to determine which innovations were sustaining and which had been abandoned. Once this data was analyzed, the responses to each question were further examined to identify any common themes relating to sustainability or abandonment. These emergent themes were then used to formulate the interview questions for phase two of the data collection. Responses to this survey[2] were also used to identify faculty members who were willing to participate in

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[2] Human subjects approval was gained prior to any data collection in this study. Along with the survey, all faculty participants were sent a copy of an informed consent form (see Appendix A) explaining the phases of the study. Signed consent forms that were returned with the completed surveys indicated the faculty member's willingness to participate in the remaining phases of the study.

the remaining phase of the study as well as a method of getting an initial look at the number of innovations that were either sustaining or abandoned.

Phase 2

According to Yin (1994), "one of the most important sources of case study information is the interview" (p. 84). Interviews used in this study were of the focused type since all of the interviewees were asked a standard set of questions (Figure 3.2) (Yin, 1994, p. 85). These questions were based on the literature surrounding the innovation process and the themes that emerged from the survey responses. Moreover, this study utilized a semi structured questioning technique (Gall, Borg, & Gall, 1996, p. 310). This method was chosen in order to allow for follow-up questions based on the interviewee's responses to the pre-determined questions. According to Stake (1995), "the qualitative interviewer should arrive with a short list of issue-oriented questions, possibly handing the respondent a copy, indicating that there is a concern about completing an agenda. The purpose for the most part is not to get simple yes and no answers but description of an episode, a linkage, an explanation" (p. 65).

Only those faculty members at the University Park campus who had agreed to participate in the final phase of the study were contacted to schedule an interview. The decision to exclude the faculty at other Penn State locations was made due to a poor response rate (n=4), the fact that each of the four faculty members were located at a different campus, and a restructuring of the campuses in 1997 might have had a direct impact on the sustainability of those innovations and could potentially skew the findings

Figure 3-2: Interview Protocol

Interview Protocol for "Sustainability of Innovations in Higher Education Study

1. C ould you describe what you think the innovation was in your course and when you think it really occurred?
2. H as the innovation changed since it was first implemented? What kinds of changes have been made? Would you consider those changes to be innovations as well?
3. I n question 4 of the survey you indicated that as a result of the innovation you made changes to other courses that you teach Were those changes identical to the innovation or did you need to adapt them? How and why did you have to adapt the innovation?
4. H ow have other faculty members in your department viewed your innovation? Have any of them made similar changes to their courses as a result of your innovation?
5. Y ou indicated on the survey that you did (did not) receive support from your department head for your project? How do you think this has helped (hindered) your innovation?
6. Y ou indicated that you did (did not) receive support from your dean for this project? What impact has that had on your project?
7. H ave you received any additional support for your innovation? What kind of support have you received? What kind of impact do you think this additional support has had on your project?
8. I f another faculty member who was thinking about making changes to thier course and was concerned about developing a sustainable innovation came to you for advice, what advice would you give them? Are there any specific factors that you would tell another faculty member to consider before embarking on an innovation?
9. D o you think that you own innovation was sustainable?
10. O n question 3 of the survey, you indicated _____. What components are continuing?
11. I n general terms, how would you describe the term "sustainable innovation"?
12. W hat differentiates a change and an innovation?
13. I f someone else has made similar changes to their course and you adopt it in your course, do you consider that to be an innovation?
14. W hy do you think that innovation doesn't happen more often across the University?
15. D o you have any other comments that you think are critical to what you did, how long it lasted, and why you are still using your innovation?

of this study. Moreover, since the University Park respondents (n=12) were representative of different departments and colleges this would insure maximum diversity and potentially create greater variability of responses for the final phase of the study (Miles & Huberman, 1994, p. 28). Eight faculty members out of the initial 12 agreed to be interviewed and their teaching and learning innovations are the ones that make up the

final cases in this study. Once interviews were scheduled, the project archives for their teaching and learning innovations that were on file at the Institute were copied and added to the case study database. The information from these documents not only served to focus certain questions during the interviews but also was used to verify data collected during the interviews, observations, and while analyzing any documents related to the way the course was currently being offered.

The use of the archival records and documents described above is consistent with methodology for case study research. Yin (1994) promotes the use of archival records and documentation as a way of corroborating and augmenting evidence from other sources (p. 81). He further suggests that documents should not only be used to make inferences, but also should be "treated as clues worthy of further investigation" (Yin, 1994, p. 81).

After all of the interviews had taken place, audio tapes were transcribed and coded in order to provide evidence as to the validity of emerging themes as well as a more detailed look at the perceptions and experiences of faculty surrounding the sustainability of their innovations[3]. In this study, the analysis of the interview transcripts did not begin until after all of the interviews had been completed because I did not want any of the previous faculty perceptions to potentially cause me to ask leading questions during the remaining interviews. Where necessary after the analysis was completed, faculty members were sent follow-up questions via email in order to clarify any points made in the interview.

After each interview session, all faculty members were asked for copies of their course syllabuses, assignments, and other written documents pertaining to their innovation. These physical artifacts were then added to the case study database for further analysis. Yin (1994) describes the use of physical artifacts as a means for obtaining a broader perspective on an element in the study (p. 90). Usually artifacts are used because direct observations can only last a short period of time and thus, artifacts give the researcher the chance to see more occurrences and gain more in-depth information. These artifacts were only requested if the innovation was sustaining at the time of the study. The analysis of these artifacts was used to verify the existence of the innovation and more importantly, to determine whether the current innovation still had some of the same characteristics as the innovation originally sponsored by the Institute[4]. In the event that there was a change in the innovation that was not previously mentioned during the interview, the faculty members were sent follow-up questions in order to determine what necessitated the change.

The final method of data collection in this study was direct observations of the teaching and learning innovations while they were taking place in the classroom. These observations were included to serve as another source of evidence that the innovations in the study were sustaining (Yin, 1994, p. 86). While the original intent was to conduct observations in each course where the innovation was reported to be sustaining, this did not happen in all cases. Observations did not occur if the course was not being offered. In

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[3] Specific coding methods that were used to analyze the transcripts will be described later in this chapter.

the few cases where the innovation had transferred to another course, observations were conducted in the original course as well as the new course. Evidence to verify the existence and consistency of the current innovation and the sponsored innovation was recorded during the observation. Once again if inconsistencies surfaced, faculty members were sent additional follow-up questions in order to gain a better understanding of why those changes occurred.

Data Analysis Methods

According to Yin (1994), a general analytic strategy should be present when analyzing a case study, and within this strategy, a specific analytical technique should be used. The general analytic strategy used in this study is the development of a case description (Yin, 1994, p. 104). The specific analytical technique that was used was pattern-matching (Yin, 1994, p. 106). Additionally, since this study involved the use of multiple cases, an analysis of embedded units was employed as well (Yin, 1994, p. 119).

Coding the Transcripts

Berg (1998) suggests that the "analysis of data is primarily determined by the nature of the project and the various contingencies built in during the design stages" (p. 90). Interview transcripts obtained in this study were coded using open coding content analysis and axial coding (Berg, 1998, p. 236). First, each of the transcripts was read in order to develop a list of general themes. These general themes were then set up as

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[4] Recall from the literature that innovations are expected to undergo minor changes once they are implemented (Levine, 1980, p. 13).

individual worksheets in an Excel workbook. Next, each of the transcripts was read again and quotes that fit within each of the general themes were copied from the transcript and pasted into individual rows in the appropriate worksheet. Once this open coding was completed, each quote was reread and given a specific code that better defined the perception of the faculty participant. These specific codes were recorded in separate columns next to each corresponding quote. Each of the specific codes was then filtered and compared with the original quote in order to determine those that were relevant to the topic of study. Quotes that reflected perceptions of sustainability were marked as such in a separate column of the worksheet. Any quote that related to sustainability was then highlighted in the original transcript so it could be used in the individual case write-ups. Finally, each of the specific codes was grouped by general theme to aid in the cross-case analysis.

Development of a Case Description

The development of a case description is used as a framework for organizing the case study. This description not only provides a detailed view of the process but can also help identify the causal links that need to be analyzed (Yin, 1994, p. 105). To aid in the analysis of the cases in this study, each case was described within the framework of the questions asked during the interview phase of data collection. Information that comprised this case description was obtained from the archival records, document analysis, observation notes, coded interview transcripts, and the responses to any follow-up

questions. Within each section of this framework, I noted any causal links that would eventually need to be more fully analyzed through pattern-matching.

Pattern-Matching

Pattern-matching logic is a way of strengthening the internal validity of a case study (Yin, 1994, p. 106). In pattern-matching, the researcher attempts to show that identical reasons for the occurrence of a phenomenon can be obtained across multiple cases. In this study, the reported perceptions and experiences of the faculty involved with the innovations were linked within and across the sustaining and abandonment groups. This was done in order to determine if there were patterns that consistently surfaced across all groups. If so, these could constitute potential factors that the faculty perceived as influencing sustainability.

Embedded Analysis

In embedded analysis, each case is analyzed for patterns and themes (Yin, 1994, p. 119). These emergent patterns and themes are then analyzed across cases in order to draw conclusions about the overall phenomenon in the study. In this study I paid specific attention to the emergent patterns and themes across cases that spoke to the issue of sustainability.

The Researcher

In this study, I held two roles: instructional designer and investigator. I am currently the Program Manager of Instructional Design at the Institute, a position that I

have held since the summer of 1997. In this capacity, I was directly involved with the innovation projects that are the cases in this study. At the present time, however, I have not had contact with either the projects or the faculty since Institute support was withdrawn.

As an instructional designer at an Institute for innovation in learning I look at myself as a change agent working with faculty members to facilitate the innovation process. The last thing I want to do as a designer is set the faculty member up for potential failure. If I advised them to adopt an innovation that they were not comfortable with then the innovation could potentially fail. If I helped them develop a technique that either wouldn't work in their course or took too much time to implement then that, too, could potentially fail. Therefore, I operate under the assumption that each faculty member comes to us with a specific need and, as a change agent/instructional designer I feel that it is essential to carefully listen to that need. Without a thorough understanding of the faculty member's teaching style and how to suggest an innovation that might work for them, I would be wasting their time and their needs would not be met. My basic philosophy as an instructional designer is to listen and to make suggestions. Ultimately, they choose the direction that the innovation will take. It is my job to collaborate with them during the innovation process to insure that the adopted teaching and learning innovation meets their goals and enhances student learning at the same time.

During collaborations with faculty the focus is strictly on innovations in teaching and learning. Meta-theoretical discussions of the innovation process do not take place and issues of sustainability are not discussed. Our discussions during meetings revolve around

the teaching and learning process and how it relates to their particular innovation. Where appropriate, theories of teaching and learning are shared with the faculty members so they develop a thorough understanding of what will work and what will not work in their course. It is my belief that if faculty members do not fundamentally understand how and why an innovation is implemented they will continue to need support and will never fully adopt the innovation.

From a researcher standpoint, there are advantages and disadvantages to having prior involvement with the innovations in the study. One advantage is that as someone who is directly involved with the innovation process on an ongoing basis, I have a thorough understanding of the time commitment that is part of the innovation process. As someone who has worked with some of the faculty participants in this study, I have already established their trust and therefore they may be more likely to share their experiences and perceptions. This openness might not occur with an outsider. As someone who works in the context of the study, I already have an understanding of it. However, this last advantage might be a disadvantage as well. Working in academia has given me the opportunity to understand the politics associated with it. As within any type of organizational system, changes in a university setting are not always made easily since those changes can sometimes conflict with the goals, values, and norms of the system (Levine, 1980). As was indicated in Chapter 2, these goals, values, and norms can have a direct impact on the sustainability of innovations; innovations that take up the precious time of the faculty member, others involved in the process, and myself.

No one enters the innovation process hoping that their innovation will eventually be abandoned and it was my hope that all of the innovations in this study would still be sustaining. Some of the projects continue to sustain and others have been abandoned. I know the time and effort involved with each one of the innovations and at times there were continual struggles, specifically during interviews, not to let my role as the project team member interfere with the researcher. As I listened to the faculty stories it was hard to refrain from interjecting my own personal view or offering advice for different approaches that could be tried. One outcome that I did not expect from the entire process was that the interview process seemed to renew the 'innovative spirit' of the faculty. Some mentioned that they would like to try again and others have contacted the Institute about new projects as a result. This apparent revitalized interest took place not only with those who had projects that were sustaining but also with those who had to abandon their projects for various reasons.

This study has been a journey and a renewal for me as well. It has reaffirmed my commitment to helping faculty through the innovation process even though, at times, this process can be a difficult road to travel given the demands of academia. The perceptions of the faculty that follow are a result of their trials, tribulations, and sometimes sacrifices. It is my hope that the perceptions that are uncovered will help others as they undertake the process of innovation and it is through this lens that I seek to describe the perceptions and experiences of the faculty involved in the innovations in this study.

<u>Limitations of the Study</u>

The first limitation of this study is the inability to generalize the findings and implications from this study to other settings. This limitation is due to the nature of case study research. While any lessons learned from this context could provide valuable information to others involved in the innovation process, the intent of this study is to provide the reader with the perceptions of the faculty participants surrounding their teaching and learning innovations. Since innovation can be a slow and complex process in which there is not always a sustainable outcome, the perceptions of the faculty in this study may serve to inform and help adapt innovative processes elsewhere.

The second limitation of this study is caused by the sensitive nature of the information shared with me by the faculty participants. At times I was overwhelmed by their openness in sharing the feelings and frustrations surrounding their attempts to sustain innovation. Some of these feelings, if reported, would reveal the faculty member's identity and potentially put their careers in jeopardy. As a result, I have made every effort to give an accurate portrayal of the findings while leaving out sensitive information. In so doing, I realize that some of the true essence of the stories was lost and other valuable evidence, such as documents, will not be shared with the reader. In those instances where this has occurred, I have tried to provide the reader with a description of either the innovation or the evidence of the innovation. Furthermore, in order to check the accuracy of the case descriptions I have relied heavily on each faculty member's review of their case write-ups. In one instance, I have had to delete parts of a quote that the

faculty member believed would compromise his anonymity and in two other instances faculty participants rephrased quotes in order to better reflect their perception of the sustainability of their innovation.

The third limitation of this study is the potential bias that I bring to it. As I disclosed in my researcher identity, I consider myself to be a change agent and I did have consultations with the faculty members in this study during the time when the Institute was sponsoring their innovation. Because of this prior involvement, I had a vested interest in the outcome of each innovation in this study. In order to control for this limitation, I have followed Yin's recommendations for dealing with construct validity, internal validity, and reliability when conducting case study research (Yin, 1994, p. 32). Construct validity has been addressed through the use of multiple sources of evidence in order to triangulate the data, I have established a chain of evidence by describing the steps that were taken to collect the data in this study, and I have had each of the faculty participants review their draft case write-ups as a way of checking for the accuracy of my reports[5]. Internal validity has been addressed through the use of pattern-matching and embedded analysis during the data analysis phase of the study. Finally, reliability was addressed through the use of a case study database.

Conclusion

This chapter has described the phenomenological framework and case study methodology that was used in this study. Specific data collection and data analysis

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[5] See member checking (Lincoln & Guba, 1985)

methods were discussed along with a disclosure of my researcher identity. Finally, I have discussed the limitations of this study. The chapters that follow will present the findings of this research, discuss their implications, and offer suggestions for subsequent research.

Chapter 4

RESEARCH FINDINGS

<u>Introduction</u>

Lecture is still the common presentation method used in classrooms at many universities. However, at Penn State and other higher education institutions some faculty have begun to move away from the standard lecture format; and instead, are beginning to seek out and adopt more innovative teaching and learning methods (Hannan & Silver, 2000, p. 2; Schreyer Institute for Innovation in Learning, project database, 2001). Over the past six years, many faculty innovators at Penn State have called upon the Institute to assist them in designing, developing, implementing and evaluating the innovations in their courses. Although it is not explicitly mentioned in our mission statement, it is our hope that all of those innovations can be sustained long enough to become institutionalized as an integral facet of the teaching and learning experience.

The sections that follow present the findings of this study of faculty perceptions of sustainability of teaching and learning innovations. The results of the initial survey of the status of innovations sponsored by the Institute from fall 1997 until spring 1999 are discussed in the first section of the chapter. The remainder of the chapter will examine the perceptions of the individual faculty innovators surrounding the sustainability of their teaching and learning innovations that formed the multiple cases in this study.

<u>Phase 1: The Surveys</u>

Sixteen of the 41 faculty who had Institute-sponsored teaching and learning innovation projects responded to the survey administered in phase one of the study. This survey was used to investigate the status of the innovations and to determine those faculty members who would serve as case study participants. Of those 16 respondents, 12 were located at the University Park campus and 4 were located at different satellite campuses across the Penn State system. The survey responses were analyzed to determine the initial reasons for deciding to adopt teaching and learning innovations as part of their course, those innovations that were sustaining, those that had diffused to other courses, the types of support that had been received for their innovations, and whether the faculty member had received tenure at the time of their innovation project.

Initial Reasons to Adopt Innovation

Results based on the responses indicated that 15 of the 16 innovations came as a result of the need to improve student learning in their courses. Additionally, 3 of the innovations were also in response to changes in the curriculum and 4 respondents indicated that the desire to innovate was in response to a reorganization of the course. The remaining respondent indicated that the innovation in their course came as a result of a student suggestion. While the sample size was small these responses clearly indicated

that there was recognition of some type of need, curricular or otherwise, in the early stages of the innovation process.

Status of the Innovations

In response to questions concerning whether the innovation was sustaining or had been abandoned, 12 faculty members indicated that the innovation was sustaining at the time of survey, 3 reported that the innovation had been abandoned, and in 2 instances the innovation had been transferred to another course[1]. Furthermore, 8 of those who reported that they were still teaching the course and still using the innovation also reported that they had implemented innovations in other courses that they taught as a result of the original innovation. At the time of the survey, it was not known however whether those were actual diffusions of the sponsored innovations or new innovations entirely.

Support for Innovations

Since the literature has shown that successful innovations should fit within the norms, goals, and values of the system (Levine, 1980), participants were queried as to whether their innovations had received support from their department head and/or dean and, if so, what type of support was offered (Table 4.1). Responses to the questions indicated that not all innovations that were sustaining had received support from the

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[1] In one instance of transfer the innovation had been abandoned in the original course and in the other, the department was no longer offering the original course.

department head and/or dean. Furthermore, two of the three innovations that had been abandoned had actually received support in the form of grants and matching funds during their initial implementation. These two initial findings could imply that either departmental and/or college changed its priorities or what holds true for organizational innovations does not apply for teaching and learning innovations. This idea was explored further during phase two of the study and is discussed in chapter 5.

Table 4–1: Support from Department Head and/or Dean

Respondent	Innovation Status	Department Head Support	Dean Support
A	Sustaining	None received	None received
B	Sustaining	Financial support for 1 year	None received
C	Sustaining	None received	None received
D	Sustaining	Matching funds	None received
E	Abandoned	NA*	Grant
F	Sustaining	Graduate TA	Funds for Graduate TA
G	Sustaining	An extra Graduate TA	None received
H	Abandoned	Funds for equipment and TAs	Matching Funds for external grant
I	Abandoned	None received	None received
J	Sustaining	Encouragement	None received
K	Sustaining	Recognition	None received
L	Sustaining	None received	Encouraged to pursue & continue
M	Sustaining	None received	None received
N	Sustaining	NA*	Encouragement
O	Sustaining	None received	None received
P	Sustaining	None received	None received

Shading indicates those innovations that were the cases in this study
* NA indicates faculty members who did not have a department head

Faculty Rank

The final factor of analysis, faculty rank at the time of innovation, was explored as a result of my experience working with faculty innovators at the Institute. Most of the Institute's project faculty members are full-time instructors, untenured assistant professors, or near-full or full professors when they decide to adopt innovative teaching and learning methods in their courses. Since this was the case, I felt it was necessary to explore the issue in order to better understand the relationship between promotion and tenure and the innovation process (Table 4.2).

When comparing faculty rank and status of the innovation, results indicated that in the three courses where the innovation had been abandoned the faculty members were untenured at the time of their project. Examination of the open-ended responses regarding reasons for abandonment yielded inconclusive results. One project faculty member reported, "This type of innovation is still not important in consideration for tenure. I was encouraged to focus energy on my other research and not trying to develop new courses" (Professor E). Open-ended responses from the other two faculty members indicated that abandonment was due to "curricular reforms that require University approval" (Professor H) and the fact that the innovation "did not work" (Professor I). However, since responses showed eight faculty members who were untenured at the time of their project reporting that their innovation was sustaining, the need to explore the issue with faculty members during interviews was apparent.

Table 4–2: Faculty Rank vs. Sustainability of Teaching and Learning Innovations

Respondent	Innovation Status	Rank at Time of Innovation
A	Sustaining	Tenured
B	Sustaining	Tenured
C	Sustaining	Tenured
D	Sustaining	Tenured
E	Abandoned	Untenured
F	Sustaining	Tenured
G	Sustaining	Untenured
H	Abandoned	Untenured
I	Abandoned	Untenured
J	Sustaining	Tenured
K	Sustaining	Untenured
L	Sustaining	NA
M	Sustaining	Untenured
N	Sustaining	Untenured
O	Sustaining	Untenured
P	Sustaining	NA

Shading indicates those innovations that were the cases in this study

In summary, responses to the survey indicated that for the majority of these faculty innovators, the recognition of a need was the impetus for beginning the innovation process. The responses tended to show that there was no direct connection between sustainability and either support or faculty rank at the time of innovation. However, no definitive conclusions could be gleaned from the limited amount of data available. What the survey did show was that there were several areas that needed to be explored more fully with the faculty participants in the cases in this study. The remainder

of this chapter will reveal the perceptions of those faculty innovators surrounding issues of sustainability with respect to their teaching and learning innovations.

Phase 2: The Cases

The survey in the first phase of the study offered a glimpse into the status of the cases that were the focus of phase two. While all 13 faculty innovators at University Park[2] were originally contacted for participation in the case study phase of this research only 8 faculty innovators agreed to participate in the final phase. The cases in this phase of the study are representative of 6 academic colleges in the Penn State system. Due to the sensitive nature of the perceptions discussed during the interviews, anonymity of not only the innovations but also the innovators is essential in this section of the chapter (Yin, 1994, p. 143). Therefore, the innovations will only be described on a general level and stripped of any information that could potentially tie them to a specific course, faculty participant or department. Likewise, the faculty members in each of the cases will be identified as professor A, professor B, etc.[3] Furthermore, following Yin's guidelines for the writing of multiple-case studies each of the cases will be addressed singly and followed by a cross-case analysis in Chapter 5 grouped around the major themes that emerged during the analysis of the case study database (Yin, 1994, p. 134).

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[2] Recall from Chapter 3, only faculty from University Park were chosen for the final phase of the study due to the poor survey response rate from the satellite campus faculty.
[3] The specific faculty letters relate directly to the letters found in Tables 4.1 and 4.2

Professor A: Peer Mentoring

The teaching and learning innovation adopted by Professor A came as a result of a student suggestion. The innovation involved the use of peer mentoring groups to help students give feedback to each other on the assignments in the course. In its original implementation the peer mentoring took place in the classroom one day a week; however, the current format has the students mentoring each other using web-based technology with in-class discussion limited to one day a week. While the original innovation has evolved since it was first adopted, it is sustaining and has been diffused to other courses.

For Professor A the need to innovate seemed to stem from an internal commitment to facilitate the teaching and learning process in the best way possible. Even the views of colleagues toward the innovative element in the classroom have had little impact on his incentive to keep sustaining the innovation. When asked about how the lack of support from his colleagues impacted his innovation the response was simply, "I don't care about the others."

I asked Professor A about the lack of support he reported receiving from the department head and dean for his innovation. This also seemed to have little impact on his determination to try new things in his course. He summed it up by saying,

> Well I honestly don't know [what kind of impact it had] because it didn't stop me from continuing to do it and it didn't stop me from trying it in other classes. I don't need external validation every time I do something. I guess I just sort of rolled my eyes and shook my head and said, well that's a problem with the college right now and that was it. I'm still doing it obviously and I'm trying to refine it.

Faced with the lack of support, I asked what kept him going. His response was,

> Well the unexamined life is not worth living. You just have to try. What's the point of just sitting around doing the same old stuff? That doesn't do anything for you. I know it's strange… If at my age I'm going to keep doing what I was doing at 30, why did I spend the last 25 years on earth. I didn't learn anything then.

The quote captures the essence of how innovation and the process of innovation are an integral part of Professor A's identity. He clearly sees himself as a life-long learner who constantly strives to improve the learning in his courses. I was struck by the notion that the idea for the innovation was from a student and Professor A was willing to take the student's advice to heart, take a risk, and adopt an innovation that now he sees as vital to the learning process.

The sustainability of Professor A's own innovation and the notion of what is meant by sustainable innovation were the next ideas discussed in the interview. He believed that his innovation was sustaining because he is "still doing it" and he "keeps trying" to make it better. While small adaptations are considered a normal part of the innovative process, the idea of continual change and refinement was new to me as a researcher of innovation. However, his perception of sustainable innovation is one "getting along with what we have…keep refining it or using its resources better." When asked to talk about why he is sustaining his innovation, he said,

> Well, I'm still using it because I think it works. To go back to my earlier story about students who are creating their own mentoring groups and the students of mine who have gone out into industry and have sought out mentors… I mean, maybe a biology professor would not see the same value in peer mentoring that I do. I'm not saying it wouldn't have a value but in my field it's also being practiced in the profession. It's becoming more and more part of the profession and so that has added value for me I think. The students start to see it…

I asked Professor A what kind of advice he would give to another faculty member who was concerned about developing a sustainable innovation in their course. His first consideration was where the other faculty member was in the promotion and tenure process, and regardless of whether they had received tenure his advice was to make sure that they had the support of their department head and dean before undertaking the innovation.

> The first thing I'd say. If you're not tenured then why don't you just focus on getting tenure first because the innovation is going to take time…and I would probably suggest that before they get too involved they should go and sit down with their department head and maybe even the undergraduate dean, who's in charge of faculty development, just to make sure that when they do all of this that in the end they don't get scorched for having done the wrong thing.

When reflecting on other critical factors that he would include in his advice to other faculty, the idea of having additional classroom support from either a teaching assistant or a teaching intern arose. He said that while he normally didn't ask for extra support personnel for his classes, it was useful to have someone else monitor and give feedback about the new things that he was trying in his class while his innovation was in its beginning stages. All of this advice seemed to stem from either personal experience or observations he had made while others were trying to adopt and develop innovations in their classes.

In summary, Professor A is an example of an innovator who has an internal motivation for doing innovation. He genuinely believes that the teaching and learning innovations in his classroom are not only a benefit to his students but have become part of who he is as a professor. To him sustaining innovation fits within his norms, goals, and

values. Outside support from colleagues and administration would be a bonus but are not necessary in helping him to sustain innovation but he does recommend such support for junior faculty involved with innovation.

Professor C: Peer Instruction

Professor C teaches a large lecture course and adopted the peer instruction technique[4] in his course as a way of not only getting students more actively involved, but also as a means of checking their understanding periodically throughout each class session. The syllabus for the course not only explains the peer instruction process but it also explains to the students the idea behind the innovation and the potential benefits that it will have on their learning. Professor C explained that while the technique had been tried in classrooms at other universities, for him the technique was a new one and therefore an innovation. The innovation is sustaining and has undergone minimal changes since it was first adopted.

During my observation of the class, students were given two questions to discuss with their neighbors and answer at different times during the lecture. It was apparent to me that the questions were designed to check for understanding of concepts as well as to encourage collaborative learning and discussion. Professor C explained that since the original implementation of the innovation, he has only modified how often it is used and

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[4] Peer instruction is a technique developed by Eric Mazur at Harvard University (Mazur, 1997). The technique involves students answering and discussing concept questions throughout the duration of the class.

how much credit the activity is worth. The innovation has not diffused to other courses because this is the only large lecture course that he teaches and therefore "the opportunity hasn't presented itself." Professor C sees positive benefits for the innovation with respect to the students in his class.

> But basically I still do it just because it does break up the course and very often I find that the students actually, well they say they like it for lots of reasons; partly because they can collaborate and also because they usually do reasonably well on it. But sometimes I see them still arguing about it at the end of the lecture when they are handing in their papers.

When discussing how other faculty members in his department have viewed the innovation, Professor C responded, "Well I'm sure they think it's fine. I'm viewed as a good teacher. Not everybody takes off on this particular thing, I don't think. It's not a huge major innovation." Professor C did initially receive funding support from the Institute for Scantron Forms to facilitate scoring of the concept questions, an undergraduate student to help put answers up on the web, and funds to buy books that contained real life examples of the concepts in the course. He considered this support to be "small" and "quite useful" at the time of the innovation. He has received continued support from the department "in terms of still using a good number of Scantron [Forms] each semester" and this has helped to keep the innovation sustaining.

When describing sustainable innovation, Professor C stated that a sustainable innovation was "something that is easy to do semester after semester without a lot of continual resources or energy from other people." On a more personal note, Professor C stated,

> I tend to be very self-sufficient in the way that I teach and try to do everything in class myself just because I like to be in control of my class. And so things that I can do continuously that I have control of, that don't require lots of extra resources, especially in terms of people to implement semester after semester, I like that.

For Professor C, it seems that he makes a conscious decision to evaluate teaching and learning innovations before he adopts them in order to determine whether they have the potential to sustain. As a result, outside support could potentially cause him to rely on others and this would detract from his ability to have control over his class and remain self-sufficient.

When asked what advice he would give another faculty member who wanted to develop sustainable innovation, his response focused on the promotion and tenure process.

> Very honestly, I would ask them what place they are in their promotion and tenure process. Clearly it's a lot of work to do innovation. Sometimes it's risky because you may not get great evaluations the first time if there are kinks which just don't work out. A lot of times none of it works out and these guys say, 'well it would have been nice if it worked out better.' It might have an impact on your SRTEs[5] and it might have an impact on your promotion and tenure. So I'd say, do it if you want, but just know that it's extra time and you might, especially in this environment, not just Penn State but most research universities, where we all live, it might be better served at least initially doing and focusing on research and doing a good standard job at teaching.

He followed by expressing the notion that while he wouldn't discourage untenured faculty members, he would definitely point out the potential hazards. I asked if he thought innovation was easier after a faculty member had gotten past promotion and tenure. He answered, "I think, well yeah. You do more things and if you get bad SRTEs

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[5] Student Ratings of Teaching Effectiveness

one semester you don't worry about it so much. You just say well that's a learning experience, maybe that was not the best thing to do and let people know that maybe that was not a good practice."

Clearly for Professor C, innovation is a self-sustaining process that requires very little in the way of extra resources. The pressure to change his class was internal and in a response to an internal need to adopt a teaching and learning innovation that would improve the student learning in his classroom and create a more active learning environment for his students.

Professor D: Collaborative Learning Groups

The teaching and learning innovation in Professor D's course is the introduction of collaborative learning groups as a means of getting students actively involved with learning the material. The innovation has the students working in groups to solve real world problems revolving around the material in the course. Review of the syllabus and problems in the course showed that the problems in the course are given incrementally throughout the semester with students working individually and then coming to a group consensus on a potential solution. Each problem in the course expands the ideas and content of the previous one with the result being a final problem that ties all of the concepts together. The innovation is sustaining and Professor D says it's "evolving and what I'm working on now is actually trying to develop it into a problem-based course still keeping the collaborative learning elements." Overall the only changes that have been

made to the innovation are minor; changes to the type of team exercise, the complexity, and the number that occur throughout the semester. She considers these minor changes to be "variations of the same basic innovation," and the evolution to a problem-based course to be "the next phase of innovation." The innovation itself appears to have become part of her overall teaching philosophy and it has diffused into other courses she teaches. She reports, "Yeah, it seems now that when I teach a course I just feel like I have to have some collaborative learning in it."

During my observation of the course while the teaching and learning innovation was taking place, Professor D began the class by spending a few minutes reviewing material and clarifying ideas from the homework. Students were already sitting with their groups so when they were given the problem they began to work immediately. There was some discussion among the group members as to how to solve the problem. Eventually, several groups headed off to the library to spend the remainder of the class researching solutions and looking for relevant information. The discussions that I overheard showed that students were not only relying on each other for assistance while working on the problem but they were also checking their notes, the textbook, and prior homework in order to pull it all together. It was apparent to me while I watched what was going on in the class that the innovation was meeting Professor D's intended goal of getting the students more actively involved with learning the material.

When I asked about how other faculty members in her department viewed her innovation and what impact that has had on the innovation itself, Professor D responded,

> Well I think they've viewed it positively. I know some other faculty have
> worked with the Institute. I think our faculty are fairly innovative to begin
> with so it's not like I'm the only one doing anything really innovative, but
> it's been viewed very positively.

She further stated that she did receive support from her department head in the form of

matching funds for her project and that had a positive impact on the innovation while the

support was available.

> That [the department head's support] was very helpful. I think we paid our
> intern and the matching funds allowed me to have an intern for a second
> semester and that was very helpful. Someone who is not a teaching
> assistant but is looking at the teamwork and helping to facilitate the
> teamwork.

However, the innovation has been harder to manage since the intern funding was

dropped.

> It's [the undergraduate intern support] something that I think I should have
> been doing; it probably would have made my attempts at this in larger
> sections a lot better. I think it's going well. It hasn't gone badly. I haven't
> given up. It's just that when I have 20 teams, last fall I had 2 sections of
> 120 students, I had 20 teams in each section. You know, I just don't have
> that close contact with the teams and even know who's in them or really
> how they are progressing.

Nevertheless, despite the lack of intern support she seems committed to sustaining the

innovation because she perceives that it benefits student learning. I felt that, for Professor

D, the benefits of the innovation made the extra time and effort she needed to put into

carrying it out worthwhile in the long run. This commitment was evident in the way she

described what the notion of sustainable innovation meant to her.

> Well that the innovation would continue to be used in a course. Maybe not
> necessarily exactly in the same way that it was first introduced or
> improved upon. But it would be used in some form. Collaborative

learning, I use it in different ways every semester but I use it and I consider that a core or centerpiece of the course.

When asked what advice she would give another faculty member who wanted to develop a sustainable innovation, Professor D advised,

Get as much support as you can from within your department and college and external resources as well. I just think that it's really difficult to do it alone. And by support I don't mean necessarily financial support, but moral support or whatever. Although financial support helps a lot.

At first this response seemed a little contradictory to me since Professor D was obviously sustaining her innovation without the support that she said was necessary. However, I think that this contradiction somewhat reinforced the sense of commitment that I gleaned from our conversation. Professor D truly seemed committed to her innovation and she was willing to sustain it in spite of having little or no support. I asked Professor D if she had any additional advice and she expressed a concern about lowered teaching evaluations and the possible ramifications that may hold on the tenure process.

So I think when you try new things you do have to be aware of how the teaching evaluations are going to be used. If you are in the tenure track process then I think if you are going to do it then you really should have some documentation that you are trying something new. Rather than just say I think I'm going to try something new this semester and then not have it work out and have it reflected in teaching evaluations… I do think non-tenured faculty have to be somewhat careful.

Professor D had already received tenure when she began her innovation and while her teaching evaluations had dropped during the first semester of implementation, they did eventually rebound. She reported that there have been times when her evaluations have dropped again and that this usually coincided with modifications to her innovation. Professor D suspects that the teaching evaluations might become a factor when she goes

up for promotion to full professor so she has been documenting the innovation and keeping her department head and dean aware of what she is trying to do in her course.

Professor D feels that her own innovation is sustainable and she is taking steps to make sure that someone else could adopt the innovation if they were ever to teach the course. A teaching manual has been authored to provide the necessary documentation to make that happen. However, she is quick to point out that even though the collaborative learning process and activities have been documented, if the teaching and learning innovation does not fit another faculty member's teaching style the innovation probably will be abandoned.

> It is a certain style of teaching I think as much as it is; well it's a certain style of teaching and I don't know that's always the choice of a faculty member so… But I'm really the main teacher for this course and if I don't teach the course I can't guarantee another faculty member would use the innovations. As I said I'm trying to get some things into place that would make it easy for someone to just do it and continue the innovation.

In summarizing Professor D captured the essence of why she continues to sustain innovation in her course. For her, it has become part of who she is as a teacher and has become integrated into her teaching philosophy.

> I think it's worthwhile. I just can't imagine gong back to, even though I have the course set up so that I could do it, going back to where I was just lecturing and never having any collaborative learning at least, if not problem-based learning in a course. I just can't imagine doing that for 15 weeks of the semester… I ask myself every semester, 'Is this worthwhile?' Then I think, well yeah, because I think they [the students] are getting more than my throwing out information to them. I don't think I have all of the answers yet. So I figure that by the time I retire, you know this is a lifetime, really a lifetime effort.

Professor F: Collaborative Learning Groups

Professor F teaches a large lecture, general education course and has adopted collaborative learning groups as the teaching and learning innovation in his course. The innovation was originally adopted as the result of a need to improve student learning and due to changes in the general education curriculum requirements at Penn State (Appendix B).

> We did not think that [lecture] was the most effective way to conduct this course and I think it was just a happy coincidence that Gen. Ed. Requirements came along just about the same time or shortly thereafter. So our goal was to move away from a lecture format to a combination lecture format with group activities.

The collaborative learning activities in the course included issue discussion, projects, debates, and role-plays. The activities took place in the classroom as well as during breakout sessions and the course syllabus reflected those days when a group activity would take place. Professor F described that during the class periods he and the teaching assistants assigned to the class facilitated the activities. The innovation was adapted somewhat after its initial implementation and the use of breakout sessions has been abandoned because the necessary teaching assistants are no longer assigned to the course. At the time of the interview, Professor F had reported that the innovation had been abandoned; however, he has subsequently reported that he decided to continue the innovation in a modified form and has cut back on the number of group activities. To address the loss of breakout sections, he now has the student groups scatter around the room or work in the adjacent hallways. He expressed his commitment to the innovation

by saying, "It is a pain but I just could not bring myself to abandon the activities completely. They are too useful." The innovation has been diffused to two other courses that Professor F teaches and it appears to be sustaining in both as well.

> I have incorporated the innovation into [the other course] and I have them [the students] do a group project, which they work together on, and they make a presentation to the class. I also have them sit in groups and I can stop the class and give each of those groups that are sitting together a scenario which they can discuss, apply the material to, and make a decision or judgment.

I conducted my observation in one of the courses where the innovation had diffused since the original course was not offered at the time of data collection. Professor F began by giving the students a short quiz on the assigned readings. This was followed by a brief discussion of topics and then each group was given an issue to study and resolve. While they were working, Professor F circulated around the room and answered any questions that they had. After every group had finished there was a class discussion based on their resolutions. To me, the innovation appeared to be an ideal means of getting the students involved with actively discussing the concepts in the course.

During the interview, I asked Professor F how other faculty members in his department have viewed his innovation and what type of impact that has had.

> Well, I'm not sure it had. Well, it's hard to answer that question. I'm not sure that I know. You know, [another faculty] was and has been doing active and collaborative stuff in her class. I hear from different sources that some of our faculty are doing that and I know from other sources that some of our faculty are doing the same thing they have been doing for 20 years, lectures, etc…

My assessment of his response is that while other faculty members in his department appear to be indifferent to his innovation, this indifference has not had a significant

impact on Professor F's ability and commitment to sustaining innovation. As we progressed through the interview, I realized that the benefits to the student learning were so important to Professor F that he would try to find ways to sustain his innovation in spite of any barriers that he might face in the process.

At this point I followed up by asking Professor F to describe sustainable innovation for me. I was curious since his experience with innovation had not been easy and despite the problems, he had diffused the innovation to other courses as well. In referring to his own innovation as well as sustainable innovation, his reply was,

> We've tried a number of things that we haven't tried before. Some of them work, some of them don't work for various reasons and that's how we learn. We keep what works and discard what doesn't. You know if you keep working in that way, I think you really continually improve the course and I think eventually get it to a place where it's in kind of an optimal situation. It's the best situation you can provide but that doesn't happen without some support, some resources and a real strong commitment from the University and I don't see that.

When I asked what advice he would give to another faculty member who was concerned about developing a sustainable innovation in their course, Professor F replied,

> Well, I don't know that I would discourage them but I would try to make them aware of the hurdles that would be placed in front of them. If this were an untenured faculty member, I would tell them to forget it. That's certainly clear. Because these things take a significant amount of time if you're going to do them right. That time comes out of the faculty member's time, it's not, other responsibilities aren't waived, they're not given summer money to do these things, and despite what the university and college says, teaching is still a relatively low priority I think. Good teaching, teaching that involves active and collaborative learning. An untenured faculty member shouldn't be spending their time doing this because it would be professional suicide.

Professor F continued to express his concern for untenured faculty members who wanted to adopt a teaching and learning innovations. He spoke of specific instances where he knew of faculty who were denied tenure because he perceived that they had devoted too much time to their teaching and too little time to research. When giving advice to tenured faculty member,

> Tenured faculty, I would tell them that there are a number of hurdles that are going to be placed in their way. This lack of funding. And I'd also let them know that these things take a great deal of time.

However, in spite of the amount of time that he perceives innovation to take, he still "thinks it's worth it but for a lot of faculty, you know they are just not going to do that. Too complicated."

I asked if he felt that his own innovation was sustainable and his perception was that even though it had diffused to other courses since it was abandoned in the original course it obviously wasn't sustainable. He commented further by saying,

> There's not a tremendous incentive to do it. You know I just went up for promotion to full professor and while this didn't have an effect I know in fact that these kinds of things are not recognized, at least by this college there's not a tremendous amount of recognition for it. So is it sustainable? In the future will I be able to get it back to where we had it? I don't know.

In summary, Professor F views his innovation as not only a response to a University mandate but also a way to better facilitate student learning in his classes. While the innovation had been abandoned for a short time it has subsequently been revived and is currently used in the course. Despite his perceived frustrations with the lack of University commitment for innovation, Professor F continues to find a way to sustain innovation and is truly committed to the innovation process.

Professor H: Technology-Assisted Instruction

The teaching and learning innovation in Professor H's class was adopted as a result of a need to improve student understanding of the concepts in the course. The innovation has the students working in teams using technology-assisted instruction in the form of simulations so they can better visualize more difficult concepts. Professor H discussed that while the innovation had been used in his curricular area at smaller universities, "you'd be hard-pressed to find another large public university that's doing anything like we're doing." The innovation has been abandoned in the original course but continues to be used in an honors section of the course although it has been "scaled back slightly." I was able to observe the innovation while it was taking place in the honors section. The students spent the entire class period working on their projects in groups using simulations designed specifically for the course. While they were working, Professor H walked around and answered group questions.

We discussed why the innovation seemed to be successful in the honors section but had been abandoned in the original course. Professor H felt that the reason for the abandonment was based on student unhappiness with the innovation since his section of the course was the only one offered using the innovation. In his words,

> Students would come into the course and they were expecting the course to be like all of the other [course] sections. And they would discover that they were working harder than their friends in the other sections. Not because their friends in other sections shouldn't have been working as hard but the structure of the course is such that there is one day a week, one out of three days or maybe one out of five days is spent with the students working in teams. And if they don't come prepared they hate it because they're embarrassed, they don't know what they are talking about.

> Whereas if it's just a lecture course they can just sit out there and if they don't come in prepared it just doesn't make a bit of difference.

He did not perceive the same student unhappiness in the honors section and attributed this to a difference in student interest in the learning process. Professor H added that another reason for abandonment of the innovation in the original course came from lack of "long-term sustainable rewards" and the amount of time it took to do the innovation. He followed by adding that another issue that affected the innovation's sustainability was the "feeling of being burned out. And in the end I was just tired. Professionally you may want to teach something else at some point and there's no one else that picks it up."

I asked how the other faculty members his department viewed the innovation and if their views had any impact on the innovation. Professor H said that the feedback the received from faculty colleagues was "very good in a sense. They said this is marvelous, this is very good stuff, etc. Are they interested in doing it? No." My own perception of this comment was that the feedback he received from other faculty members did have an impact on his ability to sustain the innovation in his section of the course. My perception was that if other faculty members who taught the course had also adopted the innovation then the student unhappiness with the innovation might not have been a factor. However, this was purely speculation on my part and it could be that the amount of time involved with sustaining the innovation would have led to its eventual abandonment anyway.

The innovation did receive support from Professor H's department head in the form of a reduced teaching load when the innovation first began. He also received funds from the dean of the college to buy necessary equipment. When I asked what kind of

impact that had on the innovation he said "it certainly wouldn't have been possible at all without it." While the support in the form of reduced teaching load and funding from the department head and dean is no longer there and the innovation has been abandoned, Professor H has not given up hope.

> We have all of the materials so in a sense there's something there that's been created and it's been used. We just need to carry it further if we want to have permanent impact. I think, as far as I can tell at this point if I was to predict a permanent impact that this will have ten years from now. My hope would be that there would be a course on the books that students could take which would involve this.

Professor H felt that his innovation could have been sustainable "with substantial resources" and "institutional support." I followed up by asking him to describe sustainable innovation. His answer. "Sustainable innovation means to me that it's an innovation for which funding is always available, for which new faculty can get into with sort of minimal effort. Something that is in the books and keeps on going that way." He followed by adding, "It's just any innovation that other faculty will do without being coerced."

I asked what advice he would give to another faculty member who wanted to develop a sustainable innovation. His answer,

> If it was an assistant professor, I'd say don't do it. If it wasn't then I guess my advice would be minimal use of computers and don't make it so that it takes a huge amount of your time every time you do it otherwise you're not going to want to do it. There's just not, at a place like Penn State the rewards aren't there for doing this kind of stuff.

Professor H did acknowledge that he said this with "mixed feelings" because while the innovation did take time away from research and publication he believes it actually

helped him obtain tenure because of the teaching awards that he received as a result of doing the innovation. He offered four basic areas that any faculty member adopting innovation should be concerned with.

> Establishing ways of measuring progress [of the innovation]. There has to be some feedback mechanism to the students to tell them that they are doing okay. Make sure that they do have commitment from the department head and the dean. Publications, they need to get publications out of this.

In summary, Professor H adopted his teaching and learning innovation as a means of improving the student learning in his course. While he perceived the innovation to be the norm at smaller universities, his attempt to adopt the innovation at Penn State failed. Without further research into the differences between Penn State and other schools where the innovation has been successful, it is impossible to speculate on whether there are additional reasons that led to the abandonment of the innovation in this particular course at Penn State. However, Professor H's perception is that student unhappiness and lack of rewards and incentive were the main reasons for the innovation's demise.

Professor I: Student-Assisted Case Writing

Professor I teaches an upper level course in her department that is required for the major. She adopted her teaching and learning innovation of student-assisted case writing as a way of developing a supply of web-based case studies that were specifically geared to the issues she teaches as well as to improve the student learning in her case-based course. Support from the Institute for her innovation was to fund an undergraduate intern

to assist in both the writing of the cases and uploading them to the course website. She

has since abandoned the idea of using undergraduate help.

> I have since written other case studies and used them in that class and I've
> transferred what I've learning about case teaching into other classes but
> the idea of using an undergraduate to help me with this did not work.
> Partly my fault. I think there were structural problems.

She feels that using cases as a method of teaching is not an innovation however since she

had been using the method prior to support for her innovation from the Institute. I asked

about the type of support she had received from the department or college and the impact

that it had on the innovation. She said that doing the innovation was difficult at the time

since she did not have tenure.

> The burden of planning and implementing and sustaining an innovation is
> pretty significant for all of the other things that an assistant faculty
> member has to do. I was trying to get a program of research started and a
> few other things so there was really no incentive for me to continue it. I
> suppose if there had been moral support or other kinds of more tangible
> support, you know more resources or something, I might have sustained it
> because I was interested but I knew I had to focus on other things to get
> tenure.

When asked to describe what sustainable innovation meant to her,

> A new idea or technology gets implemented and it continues. The process
> requires that there is a continuous improvement the whole time it is in use.
> So whatever the innovation was at time 1, it's a different innovation at
> time 2 and at time 3 and from time 1 to 2 to 3 to time n. I would say
> sustainable innovation recognizes that the first time you try something it's
> not always going to work. But you don't stop it, you keep going with it
> until, of course, it just becomes institutionalized and then it's sustained but
> it's not an innovation anymore.

I asked what advice Professor I would give to another faculty member who wanted to

develop an innovation that was sustainable. She said,

> If they came to me I would say make sure it counts for something. In research, teaching or service. And well, examine your own personal reasons for doing it. Why are you doing it? Are intrinsic rewards enough for you or do you need some more tangible rewards as well? And for people who are just intrinsically motivated, it's not a problem.

Clearly Professor I's personal experiences with adopting innovation weighed heavily on the advice that she would give to other faculty members. However, this did not seem to deter her from adopting other innovations even though she had not yet received tenure. I perceived her to be intrinsically motivated and willing to continue to adopt innovations as long as she kept a balance between teaching, research and service. This notion became more evident as we talked about other innovations that she has adopted while teaching at Penn State. She added, "Plenty of other new ideas and technologies I've adopted have just become central to the way I'm teaching here at PSU." Even though Professor I abandoned the Institute-sponsored innovation, she did point out that others she has adopted are continuing to sustain.

> The bigger issues of using cases and using technology, those have been successful innovations for me. There have been changes every semester that I improve it. So the innovation gets better and better. The one thing that both of them [the innovations] have in common is that there is an extra hurdle to jump over, a) when you are a junior faculty trying to do your research, and b) when the administration or senior faculty in the college don't view it as a priority. So those conditions existed for both of my innovations – not a college priority and I was a junior faculty. Yet, one kind of succeeded and the other didn't and I guess the reason I'd say is that one I could do on my own without costing a lot of money and the other I really needed resources to continue it.

Perhaps the above quote holds the answer for untenured faculty who are interested in adopting innovations in their courses. That is, if the innovation fits within the goals of the department and/or college, then it will be easier to adopt and sustain innovation.

Professor K: Student Learning Teams

The teaching and learning innovation in Professor K's course was the use of student learning teams. The student learning teams were not only used as an organizational technique to have students work on a team project, but the were also "integrated into the class overall." An undergraduate intern, who was trained by the Institute in group facilitation and conflict resolution, supported the student learning teams in the class. Another innovation that resulted as part of the planning phase of the innovation was the use of concept maps as a method of evaluating the conceptual understanding of the material. Both of the teaching and learning innovations are sustaining in the original course and they have also diffused to other courses that she teaches.

Since the original course was not being offered during the time of data collection, I had the opportunity to observe the innovation in one of the courses where it had diffused. During the class period, two of the student learning teams were conducting a debate around and issue that had been covered in class. Each group presented their arguments and rebuttals while the rest of the class observed and took notes. Once the initial debate was over, the rest of the students in the class were given the opportunity to ask each team questions. Professor K listened to the questions and answers and provided clarification where necessary. She then asked each group a series of questions to further check their understanding of key points that were brought up during the debate. My sense was that if the same information had been presented in the form of a lecture the students

in the class would have missed a valuable opportunity to apply what they were learning and I could see why Professor K thought this teaching and learning innovation was vital to the course.

When I asked how her departmental colleagues have viewed her innovations she responded, "You know, we don't do a lot of talking about teaching. I wish we did more talking about teaching." She indicated that most of the time she hears about different teaching methods in her department when students talk about them. On the survey, she had indicated that she had not received support for her project from either the department head or the dean. I inquired about whether that had any impact on her ability to sustain the innovation. She said that the only support she had received from the department head was recognition in the form of a "nod" and that the lack of support didn't really have an impact. "Well I think because I enjoy it I would just continue to do it no matter what." When addressing the potential impact from the lack of dean support, Professor K replied,

> There's not a lot of institutional awards for teaching well and if you're not tenured there are just penalties associated with it. They want you to teach well and supposedly you cannot get tenure if you don't teach well, but teaching will not help you get tenure. It will prevent you from not getting it but it won't compensate for anything else either. I sort of look to the dean as part of the institution and so I didn't expect it. There's nothing negative that comes out of it, it's just I don't expect it to be considered something extra. If I do it it's for me.

She talked further about innovation being "part of something that I do." I sensed that for Professor K, innovation is part of her overall teaching philosophy.

I asked Professor K to describe what sustainable innovation meant to her. Again, the notion that innovation is part of her teaching philosophy was apparent.

> Well, that it can be integrated into part of what you do. Maybe you don't do it every class but that it becomes part of your repertoire of things that you do as an instructor. Just like having quizzes or certain kinds of papers. So that it can be integrated is what it means to me to have something that is sustainable. It doesn't have to look like it's other form 100% but that you take that and continue to be able to do something with it. You know there are some things that I do in class that I don't think that other people are very comfortable with. There are some things that other people do that I'm not comfortable with. I'm not comfortable always lecturing. I'm comfortable doing a lecture when I think it should be there but I'm not comfortable just doing that on a regular basis. I think it would be easier to just type up my notes, have them and go in and lecture but I'm not comfortable with that. And I'm not happy with that. To me, I miss everything that I like about teaching when I do that.

As she continued I began to realize that her notion of "integration" was much more than just a "part of what you do" but instead it become integrated into a part of who she was. Furthermore, having the innovation become a part of who she was actually made it possible to keep sustaining the innovation despite the lack of support from colleagues and her department head.

I asked Professor K what advice she would give to another faculty member who wanted to adopt innovation and wanted it to be sustainable. She indicated that changing something just for the sake of changing was not the way to go about adopting innovation.

> I guess my advice would be to really look carefully in terms of why are you using this. Is it because it's there? And if that's the reason then it may or may not work. It may work just fine but it might not be the best thing to do and it might not suit them. Some people are comfortable with certain kinds of innovation, but whatever it is I would ask them why they are using it. And if the answer is because it's there, then I would tell them 'well my advice is to be more reflective about the teaching of the innovation and why you would want to do it. So I guess that's my motto, be reflective about the process.

Professor K talked more about telling others to "consider who they are and what they are comfortable with." She stressed that innovation was not easy and when adopting innovation they should "consider themselves and how they fit with whatever the innovation is that they are trying to do." She indicated that a support during innovation was essential and that the Institute had proved her with the support she needed during the process.

Professor K believes that innovation is not only a means of improving student learning but also a means of improving her own learning. I sensed that teaching and learning for Professor K are both part of the same process and cannot be separated.

> Innovation to me has a connotation of being new and so it's probably a little bit new each time, probably a little bit different. I look at it as part of my learning to be a better instructor. In other words, innovation, it almost has this kind of abrupt connotation to it and it's less than that in terms of, I look at this as development so I would say it's part of an ongoing development or evolution in teaching.

The notion that the improvement of student learning is the focus of Professor K's desire to continually improve was reflected as she continued.

> Every group of students is different and so I might do something one year with one group and it's fantastic. And I get a different group and there's a different dynamic and it just doesn't work. So I feel like I'm always adding to my repertoire of things that I can do to help students learn better.

As I reflected on my conversation with Professor K and my observation of her course, it was apparent that she loves teaching and considers innovation to be a vital part of the teaching process. I sensed that innovation had not been institutionalized within her course but instead had become institutionalized within her. As a result, for Professor K sustaining innovation was an assumed part of the teaching and learning process.

Professor L: Technology-Assisted Instruction and Peer Evaluation

Professor L teaches a 400 level course that is needed by students for their emphasis area within their major. The teaching and learning innovations that were adopted by Professor L include technology-assisted instruction and peer evaluation. Since students in this major normally enter careers that require an understanding of technology and real-time data collection, the technology-assisted instruction and website that was prepared for the class was designed to "accommodate them [the students] and give them a structure whereas they had none prior." Furthermore, since continual evaluation and feedback will be commonplace for these students once they graduate and get jobs in the field, peer evaluation served as a means for preparing students for that process. Professor L is no longer teaching the course however the innovations have been adopted by another faculty member and continue to sustain. He also reports that the teaching and learning innovations have diffused to other courses that he teaches.

I observed the original class being taught by another professor and the students were actively involved with using the technology, developing web pages and evaluating their peers on the application of concepts and the feasibility of their solutions. The innovation appeared to have a positive effect on their learning. The interactions with peers during the evaluation process not only provided a way to assess their understanding of concepts but also allowed the students the opportunity to defend their solutions. I also was able to observe the innovation taking place in one of the courses where it had

diffused and again these effects on the learning and understanding of the concepts was apparent.

As part of the interview, I asked Professor L how other faculty members in his department had viewed his innovation and how he felt their views had impacted his efforts to innovate. He wasn't sure how his colleagues had viewed the innovation.

> It's hard to say because I don't get to interact with them in an evaluative way as much as perhaps we could. Certainly those who know about it have looked at it with curiosity first. Also, with an interest in trying to see how they can glean and use some of the same things in their own courses. I don't know really. The few who I have spoken with who are in my own sphere of knowledge like it. They encourage it.

He added that the support at the departmental administration level had changed over time. During its initial implementation the department head at the time had been indifferent to the idea of innovation. Professor L explained that since the hiring of a new department head the support has changed.

> The previous department head, even though he was permissive of it, he didn't really seem to glom onto it as something that was, you know, let's continue this. It was just, if you want to do that go ahead and do it. It was not a case of this is the direction we should be going and this is a good example for other instructors, other faculty in the department, etc. Which is what my current department head feels.

He added that support from the dean of his college has also made him "realize that I'm not out there as a lone ranger."

Professor L considers the term sustainable innovation to be "a little bit of an oxymoron" because, in his words,

> Anything that is sustainable usually then becomes somewhat locked in and when I think of innovation I think of something that is not locked in, something that has some sense of growth or change to it. Sustainable

> innovation is probably more like speaking, in my opinion, about creating
> an environment where folks are open to making changes on a regular
> basis.

Professor L further described the environment for innovation as one that includes "colleague to colleague dialogue." For him, colleagues must be "willing to just talk among ourselves and be willing to hear other people who have other ways to view things and letting them as best as they can relate to this knowledge base." He thinks "ultimately what it really comes down to is fostering an attitude of seeing ourselves as learners." On a personal level, Professor L believes that "so long as I keep a modest opinion of myself and I'm willing to learn from others I think I will be very willing to sustain innovation." He believes that his own innovation is sustaining because of this view and he would advise others who wanted to develop sustainable innovations to consider these notions as well.

Personal Findings

The research findings discussed above have focused exclusively on faculty perceptions of sustainability. In all cases where the innovation was reported to be sustaining or diffused I found evidence of the original innovation; however, in all cases the innovation had been modified from its original form. While I anticipated minor changes to the original innovation, I didn't expect to find as many modifications as I did. However, I soon found out that for the faculty in this study modifications and continual improvement were all part of the process of sustaining innovation. As I conducted the

interviews and observed the classes where these teaching and learning innovations were taking place, I was struck by the faculty commitment to innovate. The faculty members in this study found it difficult to separate the issue of sustainability from the innovation process and the innovation itself. As a result, the overall findings of phase two are rich in detail about their experiences, their observations, and their reflections on the innovation process. Recurrent themes, which cannot be reported on here as they are beyond the scope of this study, included: Issues of adoption, frequency of occurrence of innovation, organizational structure, and the differences between innovation and change.

I found each of the faculty innovators more than willing to talk about innovation. I am not sure whether this openness came as a result of my experience working at the Institute or if they saw this as an opportunity to finally be able to talk about their experiences. They were eager to tell their stories and relate the stories of faculty colleagues who had also tried both successfully and unsuccessfully to adopt teaching and learning innovations in their courses. They each seemed to be aware of the limitations that the organizational system placed on their ability to innovate and yet each remained optimistic that they could sustain innovation within these limitations. Throughout the interviews I was overwhelmed by the fact that even though they felt the system didn't support innovation, they were determined to persevere and continue to sustain innovation. These issues will be explored more fully in the next chapter.

Chapter 5

DISCUSSION OF FINDINGS

<u>Introduction</u>

The decision to fundamentally change the way you structure the teaching and learning environment in your course represents a long-term commitment. The faculty innovators in this case study made that commitment when they came to the Institute for advice and help. The perceptions of sustainability of the eight faculty innovators in this study revolved around issues involving the organization (i.e., Penn State), the role of their colleagues and students in the innovation process, and their own perceptions of themselves as innovators. In the sections that follow, I will not only discuss the findings and implications of this study, but I will also discuss the need for further research in the area of teaching and learning innovations in higher education. Since the perceptions of the faculty members cannot be generalized beyond the setting in this study, the focus of the implications remains at Penn State. It is my hope that any information the reader can glean from this study will aid in their own understanding of the sustainability of teaching and learning innovations.

<u>Defining Sustainability</u>

The perceptions of the term 'sustainable innovation' revolved around issues of continual improvement for the faculty innovators in this study. This notion caused some confusion for me at first. I began this study with the idea that the innovations I was studying would only be sustaining if they were continuing in the course where they had originally received Institute support. I perceived a sustainable innovation as one that is eventually institutionalized as part of that course. However, the faculty innovators perceive sustainability of innovation as a process. For them, sustainability means that once the innovation begins, it continues to grow and evolve, eventually diffusing from one course to another. Kozma (1985) refers to this process of continual improvement as a distinguishing characteristic of instructional innovations. According to Kozma, "a clear line of ancestry can frequently be traced to instructor's early experiences with the same or similar innovations that are broadened, extended, or mutated with subsequent generations" (p. 307). This finding suggests that the Institute should make faculty members aware of the nature of teaching and learning innovations and help them understand that if their goal is to adopt a sustainable innovation then they should be prepared to make continual improvements.

<u>Teaching Philosophy</u>

One of the most prevalent themes that arose during the cross-case analysis was a perception of self as it relates to both innovation and sustainability. While listening to and reflecting on the answers to the questions during the interviews I had the sense that while the need to improve student learning was at the forefront, there was an internal need to innovate on the part of the faculty innovators as well. Bess (1977) discusses this notion of internal need in an article about faculty motivation to teach in higher education. According to Bess, "Unless faculty members perceive the teaching enterprise as a continuing source of profound satisfactions in life... they will rarely have the sustained role commitment that is necessary for creativity and excellence in performance" (Bess, 1977, p. 244). While this article does not specifically deal with teaching and learning innovations I think the same motivations apply here. I sensed that the faculty participants were intrinsically motivated to adopt teaching and learning innovations and the personal satisfaction they received from using these innovations helped them to continue to sustain innovation. Furthermore, their innovations became an expression of their overall teaching philosophy. Innovation for them was tied more to their teaching style than it was to the course. This notion surfaces in the literature as well. In a study comparing the outcomes of two instructional improvement programs, Kozma (1985) suggests that some of the faculty members in his study were motivated to adopt innovations in their courses because of their particular teaching philosophy and that any innovations that were eventually implemented were in congruence with their philosophy. He follows by saying

that the innovators in his study saw "instructional innovation is an integral process of personal or professional development" (Kozma, 1985, p. 312). For each of the faculty members in this study it was easier to sustain innovation because the innovation defined their teaching philosophy and teaching style. This finding appears to coincide with the findings from studies on organizational innovations in education as well. Recall from the literature on organizations that the institutionalization phase is concluded when an innovation loses its trial status and becomes accepted by the organizational structure (Levine, 1980). If we extend this idea to the findings in this study, which were not undertaken at the organizational level, this seems to indicate that teaching and learning innovations are sustainable when they become part of the faculty member and are therefore integrated within. Thus, institutionalization of innovation or, on an individual level, integration of innovation and sustainability of innovation cannot be separated.

Likewise, the notion that innovation was institutionalized within played a large role in each faculty member's ability to sustain innovation. This is in direct contrast to Levine's finding that successful innovation must fit within the norms, goals, and values of the organizational system (Levine, 1980). It seems that for the faculty innovators in this study, sustaining innovation was possible even if there was a disparity between their own norms, goals, and values and those of the rest of the system (i.e., departments, colleges, and the university). In fact, even though the faculty members had come to the realization that they should not expect any kind of external reward or support for their efforts, they persisted with the innovation. I sensed the internal motivation to adopt innovation overrode any conflicting goals that the innovation had with their department,

and as long as the innovation did not require a tremendous amount of support from the system, they could sustain it, even if this required working alone.

The implications that discussions above hold for the Institute are important to note. If in order to sustain innovation a faculty member must be intrinsically motivated to undertake innovation then the Institute needs to determine the faculty member's level of commitment to the innovation process. Likewise, if sustainability implies that the innovation eventually becomes integrated within the faculty member then it strive to gain an understanding of the faculty member's teaching philosophy and style at the onset of the innovation process. In this way, the Institute will be better able to advise and assist faculty members throughout the innovation process.

Promotion and Tenure

Faculty members in this study spoke of promotion and tenure as a barrier to innovation. Their perceptions indicate that if the attainment of tenure and the advancement of rank is the goal of the faculty member then they should not devote their time to adopting teaching and learning innovations. The faculty innovators in this study perceived a conflict between the stated goals of the University and the actual goals established for promotion, tenure, and faculty merit (Appendix D). They perceived their own priorities as teaching, research, and service, in that order. Interestingly, this is also the way the University publicizes its own mission of "teaching, research, and service." However, every one of the faculty participants in this study acknowledged that research

seems to be the actual institutional priority. Tierney (1997) reported similar perceptions from the faculty members he interviewed as part of a study on organizational socialization in higher education whereby the goals for achieving tenure were unclear and the perceived emphasis on research led them to believe that teaching was not as valued within the promotion and tenure process (p. 10). Hannan and Silver (2000) reported similar findings in their study of teaching and learning innovations. The faculty members who were interviewed as part of their study reported that teaching and learning innovations had a tendency to reduce the likelihood of promotion and even if their institution had built teaching recognition into their promotion policy, the interpretation of this policy remained unclear (p. 145).

The notion of a mismatch between an individual's perceived goals regarding tenure and the University's goals is particularly relevant in this study. When giving advice to other faculty members concerned with developing sustainable innovation, the faculty members in this study perceived the promotion and tenure process to be the key deterrent to innovation and sustainability. To answer this question each of the faculty innovators reflected on their own experiences. Most stated that if a colleague were untenured they would advise them against adopting innovation. They agreed that the promotion and tenure process was primarily based on the notions of research, publication, and teaching evaluations; the three areas were affected most by innovation. The perception of the faculty innovators was that the process of innovation and sustaining innovation required a tremendous time investment and therefore would detract from time that was necessary for research and publication. Furthermore, they each felt that this issue

of time, coupled with the negative effects that they perceive innovation has on teaching evaluations would have a detrimental effect on the professional survival of an untenured faculty member. This advice is reflected in the research surrounding teaching and learning as well. In a research study involving faculty members at 20 different colleges and universities, Massey et al. (1994) reported that even at universities where the emphasis is placed on undergraduate education, faculty perceived that research was rewarded more extensively in terms of promotion, tenure, and salary decisions and in certain situations other faculty members had been denied tenure because their research profile was lacking.

Teaching and learning innovation at Penn State will only move to the forefront and become the norm if the faculty perception of the University's philosophy toward teaching and learning changes. If the University wants to remain at the cutting edge of both research and teaching then it should put more emphasis on teaching and the support of teaching. Research is often recognized; however, the perception is that teaching and learning innovation by and large goes un-noticed. Therefore, if the University wants to support innovation it must implement changes to the way that teaching is viewed as part of the promotion and tenure process. Faculty innovators must feel that innovation is recognized and that the development and adoption of teaching and learning innovations is regarded as one of the key factors in the attainment of promotion and tenure. Establishing policy changes with respect to promotion and tenure and teaching at the department, college, and university levels can do this. Faculty innovators need to know that their efforts are going to be recognized, that the teaching evaluations conducted during

semesters where innovation are taking place are not going to count against them, and that research publications on their teaching and learning innovations will count as much as research publications in their field of expertise. These changes are minor but the potential impact they might have on faculty members engaged in teaching and learning innovations will be significant. Faculty members need to be recognized for the time and effort that goes into making learning more meaningful for the students that attend Penn State. Faculty members in this study spoke of the unclear message that comes from the administration. If the University has as its goal the attainment of more meaningful learning on the part of the students then the implications of the findings in this study suggest that changes need to be made to the way it views and supports the scholarship of teaching. Furthermore, until teaching and learning innovations are more widely recognized and supported across the University, faculty members should only adopt innovations that are self-sustaining and require little or no external support and should carefully consider adopting any innovation if they are untenured.

The perceptions involving innovation within the promotion and tenure process have implications for the Institute as well. If the perceived impact of teaching and learning innovations on the promotion and tenure process is true and the University is slow to make changes to the current process then all of us at the Institute need to take faculty rank into consideration when it begins to work with faculty innovators. While it is not the policy of the Institute to turn away faculty who are committed to developing and adopting innovation in their courses it can certainly advise them of the potential barriers that they may face as they adopt and try to sustain innovation. If the Institute is working

with assistant professors then it may want to advise them against adopting substantial teaching and learning innovations and instead have them focus on innovations that take less time to develop, are easier to adopt, and do not require external support to sustain. It should also advise them to discuss their innovations with their department head in order to make sure that the teaching and learning innovations are supported.

General Education

In speaking of issues surrounding sustainability and the organization in this study, the faculty innovators spoke frequently of a mismatch between the idea of innovation and the organization itself. The University has stated goals for moving towards active and collaborative learning and away from traditional lecture formats as evidenced in the general education requirements for re-certification passed by the Faculty Senate (Appendix B). As part of this new policy, all departments were given four years to re-certify their existing general education courses to contain active learning or the courses would lose their general education designation. While drawing up the new legislation, the Special Committee on General Education (SCGE) included a list of recommendations for both re-certification and support from the University (Appendix C). The recommendations for re-certification stated that in order for a course to be re-certified it must contain certain active learning elements. The SCGE acknowledged that departments and colleges would need additional funding to aid in the implementation of active learning and therefore they outlined a plan which recommended that funds be made

available to departments and colleges for a four or five year period. The Faculty Senate passed all of these recommendations at a meeting on April 28, 1998. The perception of the faculty in this study is that while the recommendations for re-certification were made into policy, the funding from the University has been at times misdirected by their departments and as a result some of the original teaching and learning innovations were abandoned when the money was redirected and no longer supported the general education course. The abandonment of an innovation caused by this loss of funding is not new to the innovation process. Hannan and Silver cite a similar outcome for teaching and learning innovations that were part of a study conducted in the United Kingdom (Hannan & Silver, 2000, p. 140). In their study, innovations that were adopted as a result of funding from the Enterprise for Higher Education were eventually abandoned when the funding was removed. A similar situation could occur at Penn State due to the temporary nature of the general education funding provided by the new policy. Since the general education courses at Penn State have by and large been delivered via traditional lecture format the adoption of active learning will represent a teaching and learning innovation in each. If the perceptions of the faculty innovators in this study are representative of those faculty members who are currently engaged in the re-certification process then University support, through both recognition and funding will be essential if those innovations are to sustain.

<u>Support and Collegiality</u>

The faculty innovators in this study discussed interactions with colleagues as being crucial to the notion of innovator as life-long learner. They all perceived that interactions with faculty colleagues would help them continually learn about different innovations and help them avoid the potential pitfalls that could occur during the process of sustaining innovation. Hannan and Silver (2000) also reported similar findings in their study. The faculty members that they interviewed also spoke of support from colleagues providing the "inspiration and encouragement" needed to adopt and sustain innovation (p. 30). However, most of the faculty participants in this study remarked that their interaction with colleagues was lacking and they were forced to continue to learn about innovation on their own through experience. While some of them had actually perceived some positive support coming from their colleagues, most felt that their colleagues just didn't understand or care.

Overall the faculty participants in this study reported that they didn't know how others in their department or college viewed their innovation because it wasn't widely discussed. For them innovation normally occurred in isolation. They acknowledged that doing innovation in isolation could eventually lead to abandonment if they no longer taught the course. The idea of faculty working in isolation is not new to higher education. Massey et al. (1994) reported that the faculty members in their study of collegiality in higher education also felt that they were isolated. They reported one of the reasons for this isolation was caused by the nature of academia. That is, faculty members are allowed

to make their own decisions regarding their research and teaching agendas; therefore, little consultation with colleagues is necessary. Some of the faculty participants in this case study discussed establishing an innovation support network as a way of lessening their feelings of isolation and providing a mechanism for them to talk about innovation. Kozma (1985) speaks of this type of innovation support network as being crucial to providing the moral support necessary to sustain innovation when resources and outside funding terminates.

The findings from this study along with the other research studies reported above imply that if faculty members engaged in innovation need collegial support then the University and the Institute both need to take steps to provide opportunities for faculty to communicate with one another. While over the years the Institute has tried to bring faculty innovators together, it needs to continue in its efforts. I recognize that because most teaching and learning innovations tend to exist in isolation there may be innovations that have gone un-noticed. However, it should to develop a mechanism to identify other faculty innovators and establish forums that facilitate support. In this way, faculty will feel less isolated and more inclined to sustain innovation.

Student Impact

Each of the faculty innovators in this study perceived that students played a role in the sustainability of teaching and learning innovations. These findings are similar to those reported by faculty in the study conducted by Hannan and Silver (2000). In that

study, the faculty reported that students were resistant to the teaching and learning innovations that were implemented and expressed a preference for standard teaching methods because they didn't immediately see the benefit of the new way of learning (p. 101). In this study, I sensed that the faculty innovators believed that the innovation was beneficial to the student learning in the course and that the benefits to students were the fundamental reason for sustaining innovation. However, the faculty participants reported that students played a role in two of the instances where the innovation had been abandoned. In both of these cases, the faculty innovators perceived that students didn't see the positive impact the innovations could potentially have on their learning and instead viewed the teaching and learning innovations as more work than that which would be required of a traditional lecture course. As a result, negative feedback on the part of the students contributed the to eventual abandonment of the innovations. These findings imply that as long as traditional teaching methods exist the Institute must advise faculty members engaged in teaching and learning innovations to communicate the benefits of the innovations to their students. If students don't see the benefits of the innovative teaching and learning methods then they will be resistant. This could in turn lead to lower teaching evaluations and eventual abandonment of the innovation.

Reward, Incentive, and Recognition

For the faculty participants in this study, the University, its colleges, and its departments provided very little support and incentive as they began to develop, adopt,

and attempt to sustain innovation. The reference to the lack of external reward, recognition, and incentive for doing innovation arose numerous times in my conversations with them. Many had nonetheless managed to sustain innovation despite little or no support from their department or college. However, for one faculty member who had abandoned his innovation, the lack of support and incentive eventually led to a feeling of burnout because, even though he thought the adopted teaching and learning innovation was beneficial to students, his energy to sustain was eventually exhausted.

The faculty innovators reported that if they were adopting an innovation that required support from the department or college, it was easier to sustain the innovation if it was within the departmental or college priorities. However, given that they also reported no external rewards, recognition, or incentive, their efforts were largely regarded as service to the department or college. Furthermore, when the department or college eventually withdrew the support for the innovation the faculty were forced to either sustain the innovation on their own or abandon the innovation entirely.

The findings above are reflected in the literature surrounding teaching and learning innovations as well. Kozma (1985) concludes from his findings, "Innovations require time and/or other resources... Release time, whether in the form of a reduced course load or as summer salary, is critical to the planning, development, and implementation of innovation" (p. 308). The findings from Hannan and Silver (2000) study indicate,

The decision to innovate and the position of the innovator therefore

depend considerably on the institutional culture, its declared and

operational priorities, the reward structure for staff, the availability of resources, [and] the prevailing assumptions about what is best for the students and for the institution (p. 143).

All of these findings suggest that in order to better support innovation, the institution must make some fundamental changes if it is to not only encourage and support faculty who pursue innovation but also reward and/or recognize them for their efforts. Patrick and Fletcher (1998) suggest faculty developers can serve as the catalyst for this transformation by helping administrators better understand the not only the amount of time, effort, and commitment that goes into the innovation process but also the overall benefits that teaching and learning innovations have on the student population (p. 164-168). The Institute must play a lead role in helping the University better understand the perceptions of the faculty surrounding the sustainability of innovation. It was established by the University as a mechanism for changing the culture of undergraduate education at Penn State. As a result, it must not only support the efforts of faculty members as they adopt teaching and learning innovations but it must also continue to conduct research and evaluate the impact of sustainable innovation so the University can become an agent of change.

Need for Further Research

In chapter one of this study, I established the need to conduct this research. While this study has achieved its intended purpose of bringing to light the perceptions of the faculty members surrounding the sustainability of their teaching and learning innovations, it has also established a need for further research. As I discussed in the limitations of this study, the findings from this study are not generalizable due to the nature of case study research. Therefore, a larger investigation needs to be undertaken across different universities and different Penn State campuses to determine whether the findings of this study do, in fact, hold. Specific recommendations for further research are discussed below.

It appears from the limited findings of this study that we cannot equate innovations at the organizational level with teaching and learning innovations. Prior research has shown that organizational innovations are teleologically oriented; however, it appears that the aim of faculty innovators is to design and develop an innovation that will continually evolve and never become institutionalized. In the discussion of findings in this study, I have alluded to the possibility that teaching and learning innovations eventually become integrated within the individual innovator. However, since this notion is based on the perceptions of only eight faculty members it needs to be explored with a wider range of participants at different phases of adoption in order to determine whether a similar phenomenon occurs.

For the faculty innovators in this study sustainability of an innovation implies that an innovation is not stagnant, but instead is continually evolving. While this notion was consistently referred to by all of the innovators in this study, it is something that also needs to be explored with a larger number of participants in all types of higher educational institutions. This notion of continual evolution may be time dependent as well. That is, teaching and learning innovations that have been recently implemented may initially go through more evolution than those that have been in place for a longer period. Therefore, an investigation that is not only focused on the innovators but the innovations themselves needs to be undertaken.

Finally, there were issues that surfaced during this research that were beyond the scope of the study and do require further investigation. These recurrent themes included: Issues of adoption, frequency of occurrence of teaching and learning innovations, organizational structure, and the differences between innovation and change. I believe that each one of these themes presents a study in itself in order to not only, better understand teaching and learning innovations in higher education but also, to aid universities and innovation units in developing mechanisms to support faculty in their endeavors.

Conclusion

This case study is only the beginning of what I consider to be a long journey into research on teaching and learning innovations. I began this journey in order to understand

the perceptions of faculty innovators so the Institute could establish better mechanisms to facilitate sustainable innovation. This research has not only helped me achieve that goal but has also had a profound impact on my own identity as an instructional designer, change agent, and researcher. I end this phase of the journey with a renewed passion to continue to learn about innovation in order to better help faculty in their quests to adopt and sustain innovation for the benefit of their students.

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Appendix A

Informed Consent Form
The Pennsylvania State University

Sustainability of Innovation in Higher Education Study

Contact: Jill L. Lane
304 Rider II Building
University Park, PA 16802
(814) 865-9785

As the Coordinator of Instructional Design at the Schreyer Institute for Innovation in Learning, I am conducting this study to gain a better understanding of the sustainability of innovations in higher education. It is my hope that the information gained will create a better understanding of the factors contributing to the sustainability of course innovations in the higher education setting.

Your participation in this study will consist of the completion of the enclosed survey and a potential follow-up interview. On the survey you will be asked questions concerning your course innovation project that was previously supported by the Schreyer Institute for Innovation in Learning. The survey should take no longer than 20-30 minutes to complete. During the potential follow-up interviews you will be asked general questions concerning your perceptions of factors surrounding the sustainability of your course innovation. These interviews should last no longer than one hour and will be recorded on audiotape for the purpose of making a transcript. This transcript will be used to report common themes in the perceptions of participants regarding the sustainability of course innovations in higher education.

You may ask any questions about the research procedures and these questions will be answered. Further questions should be directed to Jill L. Lane.

Your participation in this research is CONFIDENTIAL. Only Jill L. Lane will have access to your identity and to the information that can be associated with your identity. The information that you provide will be confidentially recorded and analyzed. Your name will not be used with the data. In the event of discussion, presentation, and/or publication of this research, no identifying information will be disclosed. To make sure your participation is confidential, only a code number appears on the questionnaire. Only Jill L. Lane will have access to the matching names and code numbers. All materials for this study will be kept for a period of one year, in a locked file cabinet, after such time, all audiotapes and materials will be destroyed.

It is important for you to know that your participation in this research study is WHOLLY VOLUNTARY. You are free to discontinue your participation in the study at any time, or to decline to answer any specific questions without penalty.

By signing below, you agree to the following statements:

I agree to participate in the Sustainability of Innovation in Higher Education Study as an authorized part of the education and research program at the Pennsylvania State University.

I understand the information given to me, and I have received answers to any questions I may have had about the research procedures. I understand and agree to the conditions of this study as described.

To the best of my knowledge and belief, I have no physical or mental illness or difficulties that would increase the risk to me of participation in this study.

I understand that my participation in this research is voluntary, and I may withdraw from this study at any time by notifying Jill L. Lane

I understand that I will receive a signed copy of this consent form.

_____   _____

Signature   Date

Researcher:
I certify that the informed consent procedure has been followed, and that I have answered any questions for the participant above as fully as possible.

_____   _____

Signature   Date

<u>**Appendix B**</u>

GENERAL EDUCATION IMPLEMENTATION COMMITTEE

Guidelines For General Education Reform 1998

Knowledge Domains

(Informational)

Introduction

The 30-credit Knowledge Domain curriculum replaces the previous distribution requirement and consists of: Health & Activity (3), Sciences (9), Arts (6), Humanities (6), and Social & Behavioral Sciences (6). The most significant change in the new requirement comes from the incorporation of three or more of five Active Learning Elements. They are:

- active use of writing, speaking and other forms of self-expression

- opportunity for information gathering, synthesis and analysis in solving problems and in critical thinking (including the use of library, electronic/computer and other resources and quantitative reasoning and interpretation, as applicable)

- engagement in collaborative learning and teamwork

- application of intercultural and international competence

- dialogue pertaining to social behavior, community and scholarly conduct

General Guidelines:

1.   All courses for the new Knowledge Domain curriculum must be approved by the General Education Subcommittee of Curricular Affairs and otherwise follow current curriculum review procedures established by the University Faculty Senate. No courses will be automatically transferred from the old distribution requirement to the new program or otherwise grandfathered in.

2.   The general rationale for qualification as a general education course remains in place. The comprehensive definition of general education adopted by the Faculty Senate (April 30, 1985) has not been changed. Courses whose purpose, content and activities met the old general education guidelines will satisfy the new requirements-with the addition (minimally) of three of the five Active Learning Elements.

3.   Departments and Colleges will have two options for gaining approval of courses for the Knowledge Domain curriculum: A) resubmitting previously-approved courses; B) submitting new courses.

4.   The review of both previously-approved and new courses will take place over a four-year period. Colleges must submit a comprehensive four-year (eight semester) plan showing their intent for the review of existing or new courses for the Knowledge Domain curriculum. Courses retain full General Education eligibility in their present categories of approval until their re-certification. Efforts should be made (a) to focus early on high enrollment courses; (b) to spread the full number of courses relatively evenly over the four-year period; and (c) to provide realistic amounts of time for courses that may need the most work in meeting compliance requirements.

5.   Deadline for submitting the comprehensive four-year plan to the General Education Implementation Committee is November 2, 1998. (See attached matrix for the plan.)

6.   Feedback on your comprehensive plan will be provided by December 1, 1998. The first new course submissions may be made anytime after January 1, 1999.

GENERAL EDUCATION
IMPLEMENTATION COMMITTEE
Frank Ahern
John Bagby, Chair
Greg Bednarski
Ingrid Blood
George Bugyi
Peter Deines
Evelynn Ellis
Donald Fahnline
Gary Fosmire
Scott Kretchmar
Jack Matson
John Moore
Dennis Scanlon
James Smith
Kenneth Thigpen

Appendix C

Report of the Special Committee on General Education

Recommendation #4: Integrate key competencies for active learning (writing, speaking, quantitative reasoning, information retrieval and computer literacy, problem solving and critical thinking, collaboration and teamwork, intercultural and international competence), as appropriate, in all general education courses in the domain-knowledge areas (health sciences, sciences, arts, humanities, social and behavioral sciences).

[See specific, applicable guidelines that follow.]

Rationale: In order to bridge between the learning of skills and the application of those skills to learn, it is important to have students utilize and sharpen their competencies in the knowledge domain component of the curriculum. The above recommendation is predicated on the accepted notions that (1) proficiency is reinforced by repetition and practice, and (2) understanding of content, critical thinking and problem solving in the knowledge domains can be improved by active involvement of students -- through writing, speaking and other forms of self-expression, through their work in teams, through comparisons with their own and other cultural orientations and environments, through quantitative and statistical analysis and interpretation, and through their own discovery and retrieval of pertinent information. By prescribing a handful of key competencies for integration into the domain knowledge courses, the SCGE hopes to encourage the incorporation of a more active engagement of students in their own learning, both in and out of the classroom. The Committee is aware that an obvious way to promote a more active learning environment is by reducing the class size. Large classes not only discourage discussion and student- or group-centered activities, but the evaluation of writing assignments and non-objective forms of evaluation become difficult and time-consuming. The Committee is hopeful that the recommendation will exert some downward pressure on class sizes, and anticipates that some new and reallocated resources will need to be provided. However, since it is not within our means to deliver all of general education in small classes, we should take advantage of the many good mechanisms for introducing active learning into large classes as well. The Committee intends through this recommendation to raise the expectations and challenge the status quo for what currently transpires in many classrooms, large and small.

Guidelines for Implementation: The emphasis on integration, application and active/ collaborative learning is focused on the following competencies:

- active use of writing, speaking and other forms of self-expression;

- opportunity for information gathering, synthesis and analysis in solving problems, including the use of library and computer/electronic resources and the application of quantitative reasoning and interpretation;

- engagement in collaborative learning and teamwork;

- application of intercultural and international competence;

- dialogue pertaining to social behavior, community and scholarly conduct.

It is proposed that all courses approved for the various knowledge domains (health science, sciences, arts, humanities and social sciences) incorporate as many, but at least three, of the above active learning elements, as appropriate. Such integration could occur through a combination of in-class activities and out-of-class assignments. The University Learning Resource Center, the Libraries, the Center for Academic Computing and the new Center for Excellence in Writing available to both undergraduates and instructors can offer valuable support for out-of-class learning and assistance through tutoring and training in media-based and computer resources. Peer evaluations of assignments and of participation in class or on teams should be encouraged as part of the learning (and grading) processes. Course proposals submitted for approval by the Faculty Senate, and course syllabi distributed to students, should be explicit in describing the ways the above elements are incorporated into the course. The appropriate subcommittees of the Faculty Senate would be responsible for developing relevant guidelines and for evaluating course proposals. Courses that are currently approved for GN, GA, GH or GS designation would be given sufficient time and opportunity (see below) to incorporate the new elements into what is now being done and to document for the Senate subcommittee how the above requirement is being met.

Resource Issues: This recommendation does not entail substantial new, permanent funding. However, if taken seriously, it does imply that the University must do some transitional ramping up, as faculty more aggressively incorporate elements such as communication, critical thinking and collaboration into their general education courses.

It seems plausible to this Committee that some external support could be found to catalyze such a significant and important development. Funding would, subsequently, be folded in to Penn State's ongoing processes of instructional assessment, improvement, and delivery. Perhaps the most desirable and practical approach would use a blend of foundation and matching funds. In any case, the total cost for the dual initiative outlined below would be approximately $100,000 per year. As noted, we believe that this funding should definitely be temporary, with a four- to five-year sunset provision.

How significant could the impact of this fund be? About 160 of the largest and most frequently taken courses account for about three-quarters of general education

enrollments. A five-year total expenditure of $500,000 could direct about $1,500 specifically to each of those 160 courses, at an annual cost of about $50,000. The $500,000 could simultaneously provide about $50,000 per year to enhance other existing individual courses, to develop new courses, to encourage faculty to create new course clusters, and to enable other departmental, program, and inter-disciplinary initiatives. In short, support of this magnitude is sensible in terms of the potential impact on Penn State's curricula and students.

We recommend allocating the funds in two ways: one targeted to individual faculty members, and another targeted to departments and/or programs.

The first suggestion is that the University implement a general education course enhancement program targeted to individual faculty and individual courses. One-semester awards of about $1,000 to $1,500 could assist faculty (for example, by purchasing instructional materials, buying or building an evaluation component, compensating student assistants for their help in putting together courseware and/or supporting attendance at conferences) in either converting an existing course, or developing a new general education course, to meet the criteria in Recommendation #4. The fund should also support proposals for greater curricular collaboration, as described in Recommendation #5, below.

The second suggestion is for departmental- or program-targeted grants. These would encourage faculty to approach the issue in terms of disciplinary and inter-disciplinary groupings, sequences, and clusters of courses. Funding could, for example, enable faculty to:

- improve all sections of a large, multi-section, multi-instructor, existing course;

- develop a new set of departmental general education offerings;

- improve all general education course offerings of the department;

- strengthen the assessment component of general education offerings;

- create new general education course groupings or linkages.

Department and program awards would be in the vicinity of $5,000 to $10,000. Especially at the department or program level, an appropriate use of some of this fund would be to support faculty workshops. Such workshops could help groups of faculty to climb the learning curve necessary, for instance, to:

- bring technological applications to the classroom

- design intensive, shared-learning experiences

- develop and implement strategies to encourage curricular adaptation by program faculty

- better use technology in general education delivery in a large university, and/or achieve Penn State's new integrative and collaborative objectives.

The proposal and review process should be guided centrally -- perhaps by the Office of Undergraduate Education, or the Schreyer Institute. In any case, we suggest a very basic process, with proposals limited to about two pages, and with a small review panel and quick responses. Preference should be given to proposals that address large classes and courses that are offered solely, or mostly, for general education -- as opposed to courses that are technically general education courses but in practice mostly serve the needs of particular majors. The review process would also look for evidence that the proposed project would contribute to the development of faculty skills and curricular change in a planned manner. Emphasis should be on how the initiative is likely to strategically impact the curriculum consistent with the objectives described in Recommendation #4 and, probably to a lesser extent, in Recommendation #5.

OBJECTIVE III: Encourage a curricular approval process that is more flexible and less bureaucratic, offers opportunity for interpretation and experimentation, stimulates integration and collaboration and preserves portability of courses and mobility among the disciplines.

Recommendation #5: Develop policies, procedures and guidelines for the general education curriculum and its attendant requirements that will stimulate creative, collaborative approaches, both in terms of curriculum development and delivery and in the ways students may meet the spirit of the requirements.

Rationale: This recommendation confronts the often controversial issue of how much flexibility to allow -- and inevitably raises the question of ownership of the curriculum. On the one hand, clear guidelines are needed to insure portability, so that students' mobility among the colleges, campuses and majors in the large, geographically dispersed institution -- that is Penn State -- is not compromised. Every effort should be made to avoid disadvantaging students (i.e., causing them to have to take extra courses to complete the degree requirements if they should change majors or campus location) caused by incompatibilities in courses or requirements. Appropriate constraints are needed, as well, to insure that consistent academic standards and rigor are applied and maintained. The Committee feels strongly that this undergirds all graduates' sense of

having shared an experience in general education which, along with their studies in their respective disciplines, is the source of identity and pride in their Penn State education. At the same time, however, the boundary conditions should not be so narrow and rigid as to preclude innovative and novel approaches in teaching and learning. It is not desirable that requirements become so compartmentalized that they are thought of primarily in terms of courses or credits on a checklist. And, while it is important to have a reasonably simple and understandable process for tracking student's progress in satisfying the requirements, especially given the complex "flow" of students within the Penn State system, it is desirable to recognize a broad range of valid ways in which students might satisfy the spirit of general education requirements. Too often, the Committee heard concerns from faculty that they wanted to develop new courses or do something different, but the ideas would never survive (or it was too difficult to negotiate) the approval process. Administrators voiced concern over the number of petitions or exceptions they had to handle from students who had good and legitimate reasons for doing things differently from the standard way. Students commented more frequently on the restrictive nature of the requirements, rather than the opportunities open to them. Thus, policies, procedures and guidelines should be developed or rephrased, as needed and appropriate, to emphasize what students and faculty can do in regard to general education, rather than what they can't do. The great array of undergraduate opportunities at Penn State is one of our institutional strengths. It is one that we should capitalize and build upon.

Guidelines for Implementation: The Committee envisions the policy implications of this recommendation as being addressed primarily through the appropriate committees of the Faculty Senate, with participation on implementation, as necessary, by the University Registrar, academic advising services in the Colleges, the Scheduling Office and other academic support services. Some key issues that need review and clarification include:

- • removing barriers that inhibit collaborative and cross-disciplinary course offerings and linkages that may cut across the distribution requirements (skill and knowledge domains) and/or involve faculty from different (and potentially a wider range of) academic units;

- • preserving the ability of different locations to seek approval for and offer courses that take advantage of their particular resources and faculty interests but which, as approved courses will be compatible to the easy flow of students among the locations (i.e., will satisfy the general education requirements regardless of the campus or program, at or in which, the student eventually seeks a degree;

- • simplifying and/or streamlining the process for approving, recording and tracking students' satisfaction of general education requirements (especially when upper division courses or learning not related to specific coursework are used);

- • retaining as much opportunity as possible for students to select any courses they wish from the approved, University-wide curriculum (subject to any restrictions specifically dictated by accrediting boards for certain disciplines);

- • encouraging an advising system that will help students to make informed and meaningful choices and to be aware of, and participate fully in, the wide range of options available through the general education curriculum (i.e., to satisfy individual needs in regard to experimentation or exploration, to develop a theme by electing related courses in various disciplines, to broaden and deepen their understanding within and across the knowledge domains).

A proactive stance needs to be taken that surpasses the conventional, more limited role of entertaining proposals or requests and granting, or not granting, approval. Clear guidelines (for course development and instruction), good information (for example, on suggested course clusters and how best to schedule them) and wide dissemination of examples of successful approaches (for instance, the Learning Edge Academic Program (LEAP)) are all needed to promote the responsible exercise of greater latitude in the options for curriculum delivery (course offerings) and access (course taking and other learning patterns). The new, web-based Comprehensive Academic Advising and Information System (CAAIS) could function as an effective and convenient means for advisers and students to access information on general education course offerings and options. The procedures for making adjustments to degree audits when students take unconventional, but acceptable, paths to satisfy requirements (such as independent research or service learning) need to be simplified. Finally, exercising reasonable flexibility should help when students encounter minor incompatibilities. Examples of this abound, such as the approach taken by Engineering when students change their assignment from a curriculum specifying Engl 202A or B instead of C; these students are simply asked to show proof of attending a workshop on writing in the workplace developed for students preparing for participation in the Engineering Co-op Program.

Resource Issues: Like the previous recommendation, some resources will be necessary to "jump start" the kind of collaboration and innovation envisioned here. There is some evidence that the faculty already have ideas for, and interest in, offering such courses if the real or perceived barriers to doing so are eliminated. Obviously, generating enrollments and credit hours not previously enjoyed by a unit can eventually result in reallocation of budgetary resources to the unit (currently a weak function and delayed somewhat from when the increased workload is incurred). Collaborative courses typically require the assignment of more faculty effort than courses taught by a single faculty member. There may also be "accounting" issues that need to be addressed when faculty lend their time and effort to courses not offered in their "home" departments. Even course

linkages, if they are to be effective, require that the instructors for each course spend time involved with the counterpart course, especially during the first several times the courses are offered in that mode. A new fund to support faculty and departments through the transition period of four to five years, described under Recommendation #4, would also be appropriate for some aspects of Recommendation #5. In addition, small grants are currently made available for course development through the Schreyer Institute, the IDP Center for Excellence in Learning and Teaching, and the individual colleges. These support centers also provide workshops and other programs to help faculty become familiar with good examples, models and mechanics for collaborative and innovative course offerings. The Provost's Collaborative Teaching and Curricular Innovations Special Recognition Program has, for the last several years, recognized efforts that closely approximate those targeted by the recommendation. While most of these have been oriented towards upper division courses, a similar recognition of general education entries would serve similar purposes of inducement and reward for the substantial effort involved.

Appendix D

PROMOTION AND TENURE

Promotion and tenure are awarded for academic and professional merit. The criteria for promotion and tenure are described in University Policy HR-23, "Promotion and Tenure Procedures and Regulations." The *Administrative Guidelines for HR-23* supplement but do not alter the basic policies set forth in HR-23. The *Guidelines* are available from the department head or the director of academic affairs.

University Criteria for Promotion and Tenure

University criteria for promotion and tenure have deliberately been made general in the expectation that there will be further definition and elaboration by the academic unit. Each college, the University Libraries, and the Dickinson School of Law have developed more specific criteria statements. Some departments have departmental criteria statements. Faculty members should obtain copies of the pertinent criteria statements so that they are aware of the expectations of their unit.

There are three categories, listed below, in which candidates for promotion and tenure must demonstrate achievement and potential for further progress. The University Libraries and the College of Medicine each has an additional category (Librarianship and Clinical Practice, respectively). The criteria are applied in light of the mission of the academic unit and the professional responsibilities of the faculty member.

Teaching Ability and Effectiveness: Ability to convey subject matter to students; demonstrated competence in teaching and capacity for growth and improvement; ability to maintain academic standards and to stimulate the interests of students in the field; effectiveness of counseling, advising, and service to students.

Research, Creative Accomplishments, and Scholarship: Competence, usually demonstrated through publication, exhibition, or performance, to carry out research or creative work of high quality and scholarly significance; the ability to garner grants or other external support for research or creative activity; evidence of thorough understanding of the field; maintenance of high levels of academic performance.

Service to the University, the Public, and the Profession: Participation in University, college, department or division, and unit affairs; contributions to the University's programs to enhance equal opportunity and cultural diversity; competence in extending specialized knowledge to the University and to the public; service to government, industry, public and private organizations, and professional societies.

Review Process

The review process for promotion and tenure includes both *peer* reviews by faculty promotion and tenure committees at each level--campus (if relevant), department, college, and University--and *administrative* reviews by the campus administrator (if relevant), department head, college dean, and executive vice president and provost of the University.

Tenure

Tenure is based on the potential for future advancement in the several areas as indicated by performance during the provisional period. Tenure reviews are made in the second, fourth, and sixth years of the provisional period. In the case of a negative review but without notice of termination, and in other cases where it is deemed advisable, a special third- or fifth-year tenure review may be requested by the faculty member or by the department head, campus executive officer, or dean. If the faculty member continues to a sixth-year review, the faculty member is notified before June 30 whether tenure has been granted. When continuing faculty are awarded tenure, tenure status will be effective the following July 1, immediately following the decision.

A first-year faculty member in a tenure-eligible rank whose services will not be retained receives written notice of nonreappointment no later than March 1 of the first academic year of service. Thereafter, a faculty member in provisional service receives at least twelve months' notice before the end of an academic year if his or her service is not to be continued.

The decision to award tenure is made by the President after reviews at all previous levels have been completed. If the decision not to recommend tenure is made at the college, school, or University Libraries level of review, the appropriate dean will notify the faculty member of the decision.

A faculty member holding tenure is assured that his or her services will not be terminated except for adequate cause, for retirement, for financial exigency, or for program elimination or reduction.

Length of Provisional Period

Unless specifically stated otherwise in writing, all tenure-eligible appointments are provisional until the appointee has been notified of a change in status. A newly appointed faculty member in a tenure-eligible rank will normally be required to serve a maximum of six years in provisional status, although credit may be granted for full-time service at other accredited institutions or for an earlier appointment at Penn State.

Reduction in Prior Tenure Credit

A reduction in prior tenure credit may be granted upon the written request of a faculty member and subject to the concurrence of the appropriate dean. A request for reduction in prior tenure credit will be considered only once for each faculty member. The request must be made during the first three years of the appointment or prior to the completion of the fourth-year tenure review inclusive of prior credit of tenure-eligible service, whichever occurs first.

Computing Years Toward Tenure

To facilitate the administration of tenure review procedures, there is a common tenure anniversary date of July 1 for all tenure-eligible academic appointments. This tenure anniversary date will not necessarily coincide with the faculty member's date of initial appointment. A year of credit toward tenure is earned in any year in which a tenure-eligible faculty member has full-time active employment status for no less than six months between July l and June 30. Since the purpose of the provisional period is to provide an opportunity for observing the faculty member, time spent on leave of absence is not considered part of the provisional period.

Staying of the Provisional Tenure Period

Upon the written request of a faculty member, the executive vice president and provost of the University may grant a temporary staying of the provisional tenure period, if, in his or her judgment, the academic performance of the provisional faculty member would be adversely affected by the responsibility as primary care giver after the birth or adoption of a child, a serious personal illness, the provision of care for a seriously ill family member, or any similar situation. This special exception is for one academic year and is normally granted only once. During this period the faculty member would not be evaluated according to the tenure guidelines, and the year would not be counted toward the provisional period. At the end of the stayed year, the faculty member continues on the tenure track.

Promotion

Promotion and tenure are separate decisions, although they may be considered concurrently. Promotion is based on recognized performance and achievement in each of several areas, as appropriate to the particular responsibilities of the faculty member. Decisions on promotion to the ranks of associate professor and professor, or their equivalents, are made by the President after reviews at all previous levels have been completed. Promotions up to and including the rank of assistant professor, or its equivalent, are made by the academic dean of the relevant unit. Promotions customarily take effect on the following July 1.

Further Information can be found at http://www.ohr.psu.edu/policy/hr23.cfm

VITA

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EDUCATION

2001	D. Ed.	The Pennsylvania State University Instructional Systems
1992	M. Ed.	Rosemont College Computing in Education
1987	B. S.	The Pennsylvania State University Secondary Mathematics Education

HIGHER EDUCATION EXPERIENCE

2001	Program Manager of Instructional Design Schreyer Institute for Innovation in Learning The Pennsylvania State University
1997 – 2001	Coordinator of Instructional Design The Schreyer Institute for Innovation in Learning The Pennsylvania State University
1997	Web Consultant College of Engineering The Pennsylvania State University
1995 –1997	Assistant to the Director Engineering Instructional Services The Pennsylvania State University