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Issues Concerning the Use of Technology
For Distance Education and University
Faculty Development
presented by

Stacey Lyn Marie Gizinski

has been accepted towards fulfillment
of the requirements for

___MA_____ degree in _Telecommunications

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ISSUES CONCERNING THE USE OF TECHNOLOGY FOR DISTANCE EDUCATION AND UNIVERSITY FACULTY DEVELOPMENT

By

Stacey Lyn Marie Gizinski

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Telecommunications

1995

ABSTRACT

ISSUES CONCERNING THE USE OF TECHNOLOGY FOR DISTANCE EDUCATION AND UNIVERSITY FACULTY DEVELOPMENT

By

Stacey Lyn Marie Gizinski

Too often technology is used without thought to the changes it demands. In the university setting the same is true; often times technology is implemented for use as a delivery system for distance education, but the changes the technology demands on the organization, the faculty, and the instruction is overlooked. The purpose of this paper is to examine the factors that affect the way in which university faculty members respond to changes resulting from the use of technology for distance education. As a result of an extensive review of the literature and a general observation of how universities are addressing such issues, it is clear that university faculty members need an improvement program that addresses organizational, instructional and technological changes. A list of recommendations has been devised for design of a faculty improvement program that addresses appropriate issues when considering change and technology.

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Introduction

In today's society, the rapid rate of change has substantially redefined the role of Universities. As the information age becomes ever more a reality, there is increasing pressure from society to expand access to the knowledge resources of the university, for use in education, research and continuing professional development. Ironically, this has occurred at a time when fiscal restraints are forcing all levels of education to "to more with less" (p. 171).[1] The answer in many cases is the use of technology to deliver off-campus degree programs. This is because "It [technology] can go where it will. It respects neither walls, nor campus boundaries, nor borders" (p. 348).[2] The flexibility of technologies allows students from often hundreds of miles away to obtain a degree without the necessity of relocation; leaving family and homes, and sometimes full-time employment. The use of technology as a means for distance learning is a mutually rewarding relationship among the parties involved. Reaching beyond the traditional physical boundaries of "campus" benefits both the students, by providing opportunity and the university, by increasing enrollment. For these reasons, the use of technology is now widespread.

The explosion of the use of technology at the university level changes the role of faculty members both physically and instructionally. Often faculty members are thrust into the use of technology without familiarization to it. Technology impacts the dissemination of information and therefore requires instructors to adjust to their new environment and modify the way information is used. Thus, faculty's understanding of the technology is important to both instructional design and the students' experience as distant learners. In order to ensure that faculty have the desire to make the use of technology for distance education successful, the university needs to provide faculty information about technologies. The question then becomes: what is the best method to disseminate this

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[1] Predko, J., Spurgin, M. Galindo, J., & Gizinski, S. (1994). Collaborative Implementation of New Technologies: Lessons Learned from Administrators, Faculty, and Students. National Issues in Higher Education. Kansas: Kansas State University, 1994.

[2] Hall, James W. (1993, Spring). Educational Technology in the University: Moving from Stage One to Stage Two. Education, vol. 113, no 3.

information and nullify any fears or doubts that faculty may have of technology as a viable way of providing distance education?

An examination into the issues that affect the acceptance of technology and provision of faculty improvement led to an investigation into literature of the following disciplines: human resistance to change, change in education and the university, technological change, Instructional Design principles, and the current practices and design of Faculty Improvement Programs to provide university faculty preparation to use technology as a delivery system for distance education.

Change

"Few, if any of us, have escaped the need to change" (p. 1).[3] Throughout history, every age and culture, there is a reoccurring theme of change: government structures, country boundaries, monarchies, currencies, etc...all change. "Change is actually an abstract representation of a situation where there is removal of the known, familiar, predictable or secure, and replacement by the new and the different" (p. 54).[4] Since change confronts "the impact of counter forces of folkways, mores, and other social controls which maintain stability," it can make one feel unstable and uncomfortable (p.1).[5] This discomfort is a result of the displacement "of the known, familiar, predictable or secure...".[6] Universities are undergoing a "change" that allows students to choose between traditional, on-campus credit program or the same off-campus program delivered through technology. Changes to "routines, objects, people and social relationships" occur for those involved in distance education programs. In a classroom using technology there are more people involved in the educational process than in a traditional classroom. New routines, people and social relationships will change communication routes. Changes are even greater for university faculty because they must also adjust to new physical and instructional environments as well as new routines, people and social relationships. It is the insecurity resulting from the displacement of certain physical and instructional inconsistencies, that causes problems with the acceptance of technology for university faculty. Such problems interfere with the proper use of technology.

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[3] Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

[4] Fisher, Shirley. (1990). Environmental Change, Control And Vulnerability. In Fisher, Shirley & Cooper, Cary L. (eds). On the Move: The Psychology of Change and Transition. New York, New York,: John Wiley and Sons.

[5] Evans, Richard I.. (1967). Resistance to Innovation in Higher Education. San Francisco. California: Jossey-Bass Inc.

[6] Fisher, Shirley. (1990). Environmental Change, Control And Vulnerability. In Fisher, Shirley & Cooper, Cary L. (eds). On the Move: The Psychology of Change and Transition. New York, New York,: John Wiley and Sons.

Human Response to Change

Universally, human response to something new that affects the way in which one thinks or acts is met with aversion. Since discomfort is a result of change, it may explain this reaction. When Darwin proposed an alternative to the creationist viewpoint, his ideas were met with hostility in religious communities. Affirmation of his theory with scientific proof did not prevent this reaction. It is difficult to adapt to change. For many people Darwin was negating the existence of divinity. So, the problem people who opposed Darwin's theory had with his ideas was not his theory, but the impact that his theory had on their current state of existence; the belief in the divine nature of human creation and their values and ideals. The changes that university faculty are facing are similar. Since technologies affect both the instructional and physical environments of education, it is likely that such changes may conflict with faculty members' educational values and ideals. In order to identify what these conflicts may be, it is important to look at how and why people respond to changes to their environment.

Changes to Environment

Environment is "the circumstances or conditions that surround one".[7] Circumstances and conditions can include people as well as physical conditions. Environment is important to the way in which people respond to change because it supplies information. This is because:

> ...knowledge is socially constructed. The environment and, more especially, the other people within it, create the knowledge patterns that are open to us (p. 22).[8]

Interaction with the circumstances and conditions of environment, such as new knowledge, instigates learning. New knowledge comes from different sources. These different sources, primarily different people, can cause conflict through false, misunderstood or an

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[7] Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

[8] IBID.

overload of information. How one reacts to new knowledge affects how secure one feels. Insecurity can cause conflict and prevent further learning interaction with the environment. Inability to learn makes adaptation to change in environment difficult. This is just one way that environment can make people feel insecure. Environment can also cause insecurity when people depend on it.

Environment can become a security blanket:

...we have to accept it [environment] as axiomatic, that it is easy to be deceived. By accepting this, we begin to develop a sensitivity toward the environment (p. 17).[9]

Since environment is flexible, it can mislead. The problem is that most people fail to recognize that their environment is "flexible" and they rely on it for security. People find security in their home environments, family--things in their environment that are constant. Insecurity occurs when our environment changes, whether it be a social or physical environment. Whether or not it is believed that environment is ever-changing determines the way one will react to change. "For some, such changes are small and the stress induced is negligible. For others, large changes may induce debilitating stress or apathy. Yet some cope, if passively, with whatever changes face them. And some not only cope but also control both cause and effect" (p.1)[10] People respond individually to change. Some people have more developed coping skills than others and therefore are able to adapt easier. For other people, the mere "thought" of change makes them feel very insecure. Throughout humanity, the only uniform response to change is "[t]he more unexpected the change, the greater the demands on the coping skills that help us accommodate the new circumstances" (p.1)[11] Those who respond to change apathetically have a higher level of adaptability than those who experience debilitating stress. It may be the same change, but people react differently. This may be because one's level of adaptability is affected by how

[9] Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

[10] American Heritage Dictionary. (1993). American Hertiage Dictionary. Houghton Mifflin Company.

[11] Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

great the change is perceived to be. If a person perceives a change will be great, then it is likely that that person will experience discomfort. The importance of adaptability is that if you cannot learn, you cannot adapt; "neither individual nor organization can adapt if they cannot learn" (p. xii).[12] Whether or not one has the ability to adapt affects one's response to change.

Faculty behavior ultimately determines whether technology is accepted or rejected, used or misused, or used to its potential. Faculty will respond to change because they are people and people do not like change. The university, the faculty's environment, is changing to meet the need for increased access to knowledge resources of the university for education, research and continuing professional development. The addition of technology to deliver distance education further changes the physical and instructional environments for faculty. These changes to their environment are significant, and therefore cannot be expected to be implemented without resistance. The university has to be ready for this response. It is difficult to further anticipate faculty reactions to technology; however, analysis of changes to the environment can be indicators of how great the change and where faculty obtain their information. Knowing where faculty get their information can allow for control of information. Control may prevent overloading or misunderstanding information that might cause conflict in the faculty members' environment and thus, preventing them from learning and adapting. Examination of the environment would also determine whether there is a positive learning environment; whether or not the learning environment allows faculty the time and support to pursue development. If there is a positive learning climate, the ability of the faculty to adapt to the changes resulting from technology will be greater than if the learning environment is negative. If the faculty cannot learn from their new environment, they will be unable to adapt effectively. The whole process of communication exchange, the basis of education, is then jeopardized. Ineffective use of technology muddles the communication process and then those receiving

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[12] IBID.

the communication, students, may lose the opportunity to learn. Without communication

there is no learning.

Education and University Faculty

University as an Environment

Since environment is important in determining how university faculty will react to change, it is necessary to understand the many environments of university faculty; the university as a social system, and their physical and instructional environments. The university actually reacts to change. The university, on the other hand, has many parts to its organization and therefore each university reacts differently to change. But before one looks at how the university and faculty interact, it is necessary to understand the purpose of the university and how it reacts to change.

The nature of the university is to provide education:

> The primary challenge of education and training is not only the task of having individuals, groups, and organizations assimilate new information, but to bring about a change in the behavior of the systems through their utilization of the information. (p. 101).[13]

Education is then "a process of planned change" (p. 101).[14] The objective of the university should be to supply this change. With that in mind, it would seem that innovation, in an educational setting such as a university, would be accepted readily.

However, the university has an interesting profile. Even though the nature of the university is based on the premise "to bring about a change in (the) behavior," it is characterized by tradition:

> Higher education, as distinguished from primary and secondary education, can be characterized by even more traditional patterns. Most of these traditions have their roots in the Renaissance, the period during which the European university systems were developed. To a considerable extent, the university community has been successful in resisting change, even though a dynamic and far more complex society has evolved around it (p.3-4).[15]

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[13] Lippitt, Gordon L. (1973). Visualizing Change: Model Building and the Change Process. Virginia: NTL Learning Resources.

[14] IBID.

[15] Evans, Richard I.. (1967). Resistance to Innovation in Higher Education. San Francisco. California: Jossey-Bass Inc.

A tradition is a set of practices that are upheld throughout time. The educational process is an example of such a tradition. Students come to campus and sit in a classroom where a professor lectures to them. The students take notes, read, and then test; all for a grade. This process of learning has remained intact and is, therefore, a tradition. Many existing traditions stem from the university's isolation from community. Until the last one hundred years or so, the knowledge held within the university:

> ...offered few, if any, pragmatic solutions to everyday problems. As a matter of fact, the isolation of the university was so complete and the ideas presented within its halls were considered so irrelevant to the surrounding community that political dictators--even demagogues-- seldom saw need to interfere with academic life. This was true even if the ideas presented were diametrically opposed to those of the dictator. (p. 5).[16]

For a long time, the university existed without the need to change. While the outside community evolved, the university did not. In the past, information provided to students was intended to make them,

> ... ready to go into the world to find practical applications for his[their] knowledge. In fact, many students remained at the university to become themselves the depository of knowledge that a new generation might tap (p. 5).[17]

The professors' knowledge was just passed on to the students. After graduating, the knowledge accumulated at the university was to be made sense of on a personal level. The use of such knowledge to further society was not considered.

The role of university has evolved to include society. The knowledge once held within the walls of the university, and in the minds of its students, is now shared with society. Instead of passing information to the individual, universities have made practical sense of much of their knowledge and pass it on to those willing to learn. The university and community have been forced to interact, and therefore evolution occurred:

> Higher education has become everybody's business. In our day, the population looks to the university to provide solutions to a myriad of practical problems, ranging from the means for increasing agricultural

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[16] IBID.
[17] IBID.

production to more efficient methods of bookkeeping and better child-raising techniques (p.5).[18]

Now, "... we are forced to recognize that our colleges and universities are embedded in the larger society, and that they rarely change according to their own plans but only in response to broad social forces" (p. xiii).[19] Universities are responsible for the organization of the educational process: this is not always done efficiently. "Considerable evidence indicates that the newly revolutionary changes in our educational system lack planning, integration, and, most of all, evaluation" (p. 3).[20] This does not mean that the university blatantly disregards issues of "planning, integration, and evaluation," but other factors such as a lack of resources, including funds, affect the way in which change is implemented. These factors--lack of resources, funding, and planning--also affect how long innovation is used:

> Many changes are adopted only temporarily to be discarded later. This frequently results in a return to the old tried-and-true methods. The net change in innovations actually integrated into the educational process is small, and the tempos of the change process remain quite slow (p.3).[21]

Since university faculty anticipate that certain innovations will be discarded, they are reluctant to use them in the first place. The university as a social system creates the environment in which university faculty work. As an environment, the university is slow to change. Even though universities are slowly evolving, traditions still exist. Students still take notes, read, and then test; all for a grade. This tortoise-like movement toward something new shelters faculty from the discomfort of change. Since change at the university level is usually implemented slowly, faculty environment changes slowly and allows them more time to adapt. Slow transition from old to new makes change less noticeable. So when change occurs more rapidly, faculty's environment changes more rapidly than they are accustomed to. This increased speed of change might lead faculty to

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[18] IBID.

[19] Lippitt, Gordon L. (1973). Visualizing Change: Model Building and the Change Process. Virginia: NTL Learning Resources.

[20] Evans, Richard I.. (1967). Resistance to Innovation in Higher Education. San Francisco. California: Jossey-Bass Inc.

[21] IBID.

perceive the change as greater than it really is. To meet the demands of society, technology is being implemented quickly, therefore faculty will react. This is how the university's reaction to change, often lethargic, affects how university faculty react.

When implementing technology, it may be helpful for universities to examine past practices in regards to innovation. An examination of past practices could be helpful in determining what is needed for resources, funds, and planning. Such an examination will also assess if a tradition of abandoning innovation exists in a particular university. Providing adequate funding, resources and planning may indicate to faculty that technology as a delivery system for distance education is not just a whim, but a necessity; reassuring them that technology for distance education will not be quickly discarded. If university faculty see commitment on the part of the university it may help the faculty through the change; make the change more comfortable. Now that it is understood what the university is like and how it affects university faculty, it is necessary to examine how the university and its faculty interact.

Faculty Interaction with the University

As in any environment, faculty will react to changes in the university. However, there may not be as much aversion to change as there would be at a commercial place of business. This is because a shared mission between employer and employee exists between the university and university faculty:

> ...unlike most employees, the university professor has an unusually high vested interest in his employer's "business." His professional status depends to a large extent on the status of the university; its fate and his are often closely intertwined. The school's academic standards add to his prestige, and the total research produced by his fellow staff members increases his stature, quite independent of his own involvement in such effort (p. 63).[22]

University faculty members have a personal interest in the success of the university. When the university succeeds, so do the faculty members; through the recognition that is inferred

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[22] IBID.

from the reputation of the university to its faculty. One would think that it would be in the best interest of the faculty to follow the route the university paves. However, university faculty are not necessarily committed to the university, but instead to the mission of education. Therefore when the university does not live up to its role as a social system, university faculty are reluctant to support it.

Because the reputations of the faculty member are linked both to the success of the university and education:

> ...the college professor understandably dislikes to abandon tried -and-true methods of teaching in favor of "experimentation" with innovations, since he feels that these will, at best, require his learning new techniques and, at worst, will threaten his very status and position (p.7).[23]

This may be because it is not profitable for them to expend their time and energy on a method that will be discarded in a short time. Returning to the "old tried-and-true methods" restores their old environment and thus a feeling of security. If the faculty member does not perform as well with innovation, the entire social system is affected. This may include such things as: personal status, the university's status, and the status of education as a whole. Therefore it can be said that the faculty member avoids failure, and the insecurity of change by continuing to use methods that are proven. The avoidance of failure is another reason for the university to anticipate a reaction to change by its faculty members.

The relationship between education, the university, and faculty is intertwined--each rely on one another. This interdependence causes change to become a chain reaction. When society pressed education to respond practically to problems of agriculture, child care and other newer courses of study, universities evolved to meet the needs of education. University faculty in turn responded to the changes of the university by providing more practical research and studies. So in response to society's newest demand, to expand access to the knowledge resources of the university, education is evolving to include distance education. Universities are changing by providing distance education programs.

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[23] IBID.

It now seems to be the university faculty's turn to undergo change. Later discussion will reveal that, faculty's environment changes physically and instructionally to accommodate technology. Change to these environments, accompanied by the speed the changes are implemented, can prevent learning and thus make adaptation to the use of technology difficult for some faculty. Faculty acceptance of these technologies to deliver education is further complicated by the technology itself.

Innovation, Invention, and Technology

David O'Brien describes technology as, "a social force embracing a complex web of political, economic, cultural, and philosophical dimensions" (p.1).[24] The invention of the airplane, for instance, not only supplied individual and mass transportation, it also created: an industry that fuels economy; a transportation system that requires governing; and made a new standard of living possible. The purpose of technology, in most cases, is to improve the standard of living for humans; "Its [technology's] object was increase of the human capacity to do." (p.81).[25] Technology is derived from the term invention, which implies combining existing elements into something new. For example, the airplane is essentially a collection of existing parts such as wings, an engine, a driver, and a road. The invention of the airplane took the existing principles of animal flight, push off, power to maintain flight (gliding, flapping), descension and the landing and assimilated them. The airplane did not introduce anything new, except a new way to perceive each facet as it makes up the invention of the airplane. The technology of the airplane caused the existing parts to change to accommodate flight, the engine powered propellers, the driver became the pilot, and the road, the runway. These changes modified the environment. For instance, environments of mechanics, travelers and businessmen, changed. Because technology can change the human environment, people are adverse to it. As previously discussed, technology is currently the catalyst to changes in the environment of faculty members. The adaptation to changes as a result of using technology is complicated by fear.

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[24] O'Brien, David M.. & Marchand, Donald A. (1982). The Politics of Technology Assessment. Washington, D.C.: Heath and Company.

[25] de Nevers, Noel. (ed.). (1972). Technology and Society. Reading Massachusetts: Addison-Wesley Publishing Company.

Technology: History and Fear

During the Industrial Revolution, invention through technology

> ...created affluence and leisure [which] made it possible for Great Britain and the United States--in fact all advanced industrial countries-- to socialize the cause of education, thus giving every citizen a chance to become as educated as his God-given talents and his determination allow him to be (p.32).[26]

The reduction of time it took to complete tasks created profit and leisure time for both business owners and workers. With continuing education and more personal freedom, invention evolved into a more advanced kind of technology; technology based on the complexities of science. Man walked on the moon and the atom bomb was created. With these technological triumphs came a:

> ...great optimism about the future benefits obtainable from technology....The horizon seemed limitless--all that was required was the organization, the skill, the dedication, the tenacity, and the willingness to invest in success so characteristic of these great triumphs, and there could surely be no barrier to technology satisfying almost any human purpose. All that could stand in the way of curing disease, prolonging healthy life, feeding the hungry, providing an abundance of energy, giving wealth to the poor, was lack of will and organization. (p. 13).[27]

With this great optimism and plan of action, new technologies flourished.

With the bloom of technology came a rain shower of unexpected repercussions. "[T]echnology perform[ed] in the way originally intended, but also prove[d] to have unanticipated social consequences which [were] not welcome" (p. 16).[28] These social consequences physically affect human environment; "Waste products [from technology, the automobile for example], carelessly emitted, create a massive problem of soil, water and air pollution (p. 28).[29] Such problematic yields of technology can lead to skepticism of the propitious design of the technology. However, it is often forgotten that the impact technology has on society is determined by the way it is used. "Irretrievable damage"

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[26] IBID.

[27] Collingridge, David. (1980). The Social Control of Technology. London, England: Frances Pinter Ltd.

[28] IBID.

[29] de Nevers, Noel. (ed.). (1972). Technology and Society. Reading Massachusetts: Addison-Wesley Publishing Company.

happens when technology is used "...without giving thought to its effect on our environment" (p. 28).[30] The social consequences therefore are not a result of the technology but a result of how it is used. Society rarely accepts blame for such consequences; instead, technology becomes a scapegoat for its own misuse. By not admitting blame, society's perception of technology becomes that of an entity out of control rather than one to be controlled. To satisfy those who view technology as out of control, technology would have to accomplish its intended conveniences without social consequences. Because technology perpetuates change and people respond individually to change, to avoid what some may perceive to be a consequence is impossible. People then opt to believe technology cannot be controlled and fear it. The fear of uncontrollable technology instigates society to:

> ...leave choices and decisions up to 'the experts' who are presumably
> equipped with the specialized knowledge to understand the complexities
> involved. (p.49).[31]

Choosing not to understand the impact of technologies and leaving the choices up to someone else is proclaiming ignorance. Proclaiming ignorance allows the experts, who created technology, to become the decision makers who control it; just because they possess the specialized knowledge to understand its complexities. Experts decide how technology is implemented and how quickly its use is dispersed. To further complicate society's perception of technology, "when issues are 'presented' to the public through the media, the effect is usually that of 'mystifying' people, reinforcing their conviction that such complexities can only possibly be dealt with by experts" (p.49).[32] The idea that technology mystifies, is also an excuse for not attempting to understand technology. Not attempting to understand technology prevents people from learning about technology and "[n]either individual nor organization can adapt if they cannot learn" (p.xii).[33]

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[30] IBID.

[31] IBID.

[32] Elliot, David & Elliot, Ruth. (1976). The Control of Technology. London, England: Wykeham Publications Ltd.

[33] Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

This commentary is also applicable to science. The secrets of science are held by the few; the intelligent scientists of the world: such as Albert Einstein or Madame Curie. Each have an understanding of science which surpasses that of the average individual. Science focuses on understanding; "Its object was to elevate the human mind" (p. 81).[34] Scientists do not control science but attempt to understand its principles. But because average people do not attempt to understand science, they fear it, for the same reasons technology is sometimes feared.

To complicate the possibility of the existence of the fear, it is likely that university faculty have been exposed to anti-technological schools of thought. Several award-winning, best selling books have been written out of a fear of technology: Ellul's theory of "Technique," 1968 Pulitzer Prize winner, Rene` Dubos, *So Human an Animal*, and Charles A. Reiche, Law professor at Yale, *Greening of America*, 1970. All are works that advocate anti-technological viewpoints.[35] All these authors are:

> ...united in their hatred and fear of technology, and surprisingly unanimous in their treatment of several key themes:
> 1. Technology is a "thing" or a force that has escaped from human control and is spoiling our lives.
> 2. Technology forces man to do work that is tedious and degrading
> 3. Technology forces man to consume things he does not really desire.
> 4. Technology creates an elite class of technocrats, and so disenfranchises the masses.
> 5. Technology cripples man by cutting him off from the natural world in which he evolved.
> 6. Technology provides man with technical diversions which destroy his existential sense of his own being (p. 149).[36]

The importance, for the purpose of the examination in this paper, is not the theories of the impact of technology on mankind, but instead in their authors. Faculty are interested in the thoughts of their peers. Since these authors, some whom are also professors, are acclaimed authors, it is likely that university faculty have been exposed to these theories. Exposure to this kind of thought can create preconceived notions about technology. So

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[34] de Nevers, Noel. (ed.). (1972). Technology and Society. Reading Massachusetts: Addison-Wesley Publishing Company.

[35] Thompson, William B. (ed). (1991). Controlling Technology: Contemporary Issues. Buffalo, New York: Prometheus Books.

[36] IBID.

when faculty are presented with the idea of using technology in education, they will draw on their own knowledge of technology. If these authors are the only exposure that the faculty member has had, then it is likely that the faculty member will formulate a negative attitude. Since the nature of the assumptions made in these anti-technological works seem based upon the "*deterministic*" characteristic of technology, faculty could believe that technology "...causes other things to happen" and seems to be self guided (p. 151).[37] Such thought can encourage a transformation from skepticism to fear. Considering this as a possibility, some university faculty may fear technology.

Fear of Replacement

People may also fear technology because they think that it will replace them. This replacement concept is tied directly to the discomfort people have with change. After all, change is "removal of the known, familiar, predictable or secure, and replacement by the new and the different" (p. 54)[38] Replacement by technology would abruptly remove one's environment. This is why technological change receives a "violent response of those who see the new machine or new technique as a threat to their job security (p.102):[39]

> For example, as cybernation technology is applied to the industrial sector, the mode of production becomes increasingly capital-intensive instead of labor-intensive. Production methods based on this technology generate their own internal logic. Human input becomes redundant...(p.2)[40]

In this case, when human input becomes repetitious, it is the equivalent of unemployment; replacement by technology. And for some, this is a real fear. Faculty members do have a concern about being replaced by educational technology:

> Many professors have an understandable uneasiness about educational technology. It was not a familiar part of their education, except for

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[37] IBID.

[38] Fisher, Shirley. (1990). Environmental Change, Control And Vulnerability. In Fisher, Shirley & Cooper, Cary L. (eds). On the Move: The Psychology of Change and Transition. New York, New York,: John Wiley and Sons.

[39] Elliot, David & Elliot, Ruth. (1976). The Control of Technology. London, England: Wykeham Publications Ltd.

[40] James, Samuel D.K. (1985). The Impact of Cybernation Technology on Black Automotive Workers in the U.S.. Ann arbor, Michigan: UMI Research Press.

> language laboratories. It seems more difficult to use than it turned out to
> be. Some think it will displace instead of augment the professors or
> books or contact with the students. It can have a dehumanizing feel. It
> suggests that professors are in the entertainment rather than the
> education business (p. 8).[41]

This uneasiness is a result of the perception that technology may interfere with the
relationship between professor and student. Though this uneasiness is not about a physical
replacement, it is a fear that technology may replace the faculty member to some extent in
the minds of their students. Since students are dependent upon the knowledge of the
professors, the professor becomes less important because knowledge is now available from
other sources. A diminishing feeling of importance can cause fear and insecurity. Even
though educational technology in the above quote is describing the use of other media to
provide education, the same concern exists in regards to the use of technology as a delivery
system for distance education. Faculty fear that the technology will interfere with the
relationship between professor and student. This strengthens the possibility that faculty
may fear technology.

Someone who fears being replaced by technology is referred to as a "luddite."
According to the Encyclopedia Britannica the origin of "luddite" is "King Ned Lud."
"King Ned Lud" is a pseudonym taken by one of the leaders of the machine-destroying
movement in ninetieth century England (p. 102).[42] "Luddites" will never make a real effort
to use technology effectively. If university faculty members are "luddites," education is
jeopardized. Anyone can fear technology and this fear is capable of interfering with one's
behavior. Fear of technology adds to the insecurity of change and further complicates the
acclimation to technology. Ineffective use of technology muddles the communication
process and then those receiving the communication, students, may lose the opportunity to
learn. Without communication there is no learning and thus the shared mission of the

[41] Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[42] de Nevers, Noel. (ed.). (1972). Technology and Society. Reading Massachusetts: Addison-Wesley Publishing Company.

university and its faculty is unfulfilled. When looking at the technological change that universities are making in the area of distance education, it is important to assess how to prevent a fear of technology and abate any existing fear.

Implications of Technological Change

In addition to fear of technology and the discomfort from change, adaptation of faculty is further complicated by the fact that their role changes both physically and instructionally. In order to adapt to the impact of technological change in these areas, faculty have to overcome many obstacles. Traditionally, to teach an instructor only needed a classroom, but with the use of technology, environment becomes a key factor in the technology's success. Instead of just a classroom, instruction now originates from such places as computer labs and television studios. Charles Moore and John McLaughlin assert that "professors of the 90's must adjust to the classroom as a studio" (p. 74).[43] Classrooms are now acoustically designed for audioconferencing, equipped with computers for audio graphics, and cameras for telecourses, satellite and interactive video. These controlled environments were specially designed to discourage extraneous factors from compromising the optimum functionality of such technologies. Now faculty have to coordinate their instructional efforts with these new environments, as well as with technicians and engineers who operate the equipment.

In addition to changing the physical classroom environment, distance education "has the potential to alter in significant ways how curriculum and instruction are delivered" (p. 74).[44] Use of technology without the expansion of faculty is a tempting solution for universities addressing the expansion of education with limited financial resources. So faculty members may find themselves teaching a course designed for thirty students containing thirty students at each of two sites. This changes the design of the course:

> A course previously designed as an intimate round-table seminar
> involving a dozen students known to the faculty member will have to be

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[43] Moore, Charles E. & McLaughlin, John M. (1992, December). Interactive Two-Way Television: Extending the Classroom Through Technology. T.H.E. Journal, Vol. 19, Num. 7.

[44] IBID.

reconfigured for use by perhaps several hundred students who may never meet the instructor or one another... (p. 21)[45]

Increased class size is not the only factor that necessitates redesigning of a course. The use of distance media (technologies) also complicates how curriculum and instruction are delivered. Technologies demand increased preparation time; "[O]ne must consider everything for the on-campus site and then consider it again for each remote location..." (p. 75).[46] In addition, technology is often criticized for its impersonality because "...there is less information from body language and facial expression" (p.168).[47] This means faculty have to think more about interaction with their students because the impersonality of technology makes interaction less natural. Faculty need to be aware of this impersonality because:

> The skill of conducting a fruitful dialogue via conferencing, [Audio-conferencing, Video conferencing, Computer-Mediated Conferencing] whether one-one or one-many, is as important here for the success of the interaction as it is in face-to-face situations (p.168).[48]

So in order to be successful, this impersonality issue needs to be taken into consideration as part of the design of the course. Impersonality can be more than a lack of facial expression, it may also be the timeliness of the communication. For example, in many technologies the distance is evident in the time it takes the equipment to transmit the information between sites. Although this wait is a short time, usually a fraction of a second, the time-lapse affects the speed of exchanging information at a normal, conversational rate; normal defined by the rate of face-to-face information exchange. This lag time adds up and eventually affects what activities are appropriate to use with the technology, and perhaps the amount of material the course covers.

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[45] Beaudoin, M.. (1990). The instructor's changing role in distance education. The American Journal of Distance Education, 4(2).

[46] Moore, Charles E. & McLaughlin, John M. (1992, December). Interactive Two-Way Television: Extending the Classroom Through Technology. T.H.E. Journal, Vol. 19, Num. 7.

[47] Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

[48] IBID.

Scholars also point out that "Significant difficulties remain, particularly for those new to these modes of instruction, in effectively integrating the latest technologies with pedagogy and curricula." [49] Ideally, in order to choose the technology that will best compliment the course design and materials there would first be "...a consideration of what the student needs. Then we bring the two [media capabilities and the materials] together to see if they fit. The needs as defined will challenge the media, and clarify the extent to which they fail to deliver what pedagogy requires" (p. 181).[50] However, the opposite is usually true, "Funds are given for the development of materials using a particular medium, and the search is for the learning objective that best fits it" (p. 181).[51] As Michael Beaudoin suggests, this backwards choice of technology without considering instructional ramifications can cause conflict when integrating pedagogy and curricula with technology. This conflict can create a disagreeable effect on instruction:

> ...some faculty become overly dependent on technology. For example, some typically overuse tape or broadcast video, or do not know how to meld such resources with their own materials in a planned, purposeful way that supports their learning objectives. The medium too often assumes a causality of its own, supplanting the teacher and resulting in technology-bound activity that is debilitating to both teaching and learning (p, 22).[52]

The use of technology is not meant to be a means of driving instruction, but to expand access to and maintain quality higher education. The key for faculty is "adapt[ing] to the medium and learning to control it" (p. 76).[53]

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[49] McNeil, D.R. (1988). Status of Technology in Higher Education: A Reassessment. Paper presented at Second Annual Conference on Interactive Technology and Communications. Augusta, Maine: University of Maine.

[50] Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

[51] IBID.

[52] Beaudoin, M.. (1990). The instructor's changing role in distance education. The American Journal of Distance Education, 4(2).

[53] IBID.

Current State of Faculty Response

The above discussion identifies many issues that affect the implementation of technology as a delivery system for distance education. In order to help faculty through the change process when implementing technology issues of changing environment and interaction with those environments are important. For university faculty, there are changes to several facets of their environment; adjusting to new physical climates, time management, and course redesign are some issues that need to be addressed for successful faculty acclimation to the use of technology for distance education. These concerns affect the way faculty, and correspondingly students, at the university level adapt to the role of technology in higher education.

In a national survey of university faculty and administrators only twenty-five percent of surveyed tenured faculty expressed a very positive attitude toward personal participation in distance education. On an average, respondents were moderately negative toward personal participation...(p. 25).[54] The findings of this study suggest that cautious optimism is warranted regarding the future of distance education in US. colleges and universities (p. 32).[55]

To reduce faculty hesitations, some suggest:

> ...the transition to alternative delivery systems must be aimed at securing a commitment from all levels, especially top administration, to overcome resource limitations, remove structural constraints, and combat attitudinal barriers (p. 27).[56]

Distance education programs exist without the use of technology, but most programs follow a traditional approach to education. For instance, many programs require faculty members to travel to the distant sites so that the traditional classroom and learning process can be maintained. The transition from the traditional education mentality to the idea that

[54] Clark Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education..

[55] Clark, Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education..

[56] Beaudoin, M.. (1990). The instructor's changing role in distance education. The American Journal of Distance Education, 4(2).

education can be effective even though the instructor is not in the same room, needs be dealt with. The university needs to support the use of technology as a delivery system for distance education from all levels in order to reassure faculty that it can be effective. The university needs to project a positive outlook to its faculty members because "the key to success in the implementation of any innovation lies in its acceptance. Without a positive outlook, the adaptation will be a struggle" (p.342)[57]

The above findings indicate that there is a problem with the way in which university faculty are responding to technological change. There is consensus in the literature that in order to ease faculty into distance education situations, "the opportunity for meaningful involvement, professional development, and institutional support are the key factors in promoting faculty receptivity and significant contributions to distance education programs (p. 28).[58] Various institutions attempt to provide meaningful development in various ways. For instance, prior to teaching a class using technologies, Michigan State University's Instructional Television (ITV) offers an optional orientation for faculty given by ITV staff. The University of North Dakota has implemented a three day in-service training program for faculty.[59] According to Dr. Kent Creswell, Michigan State University Manager of Instructional Television, another way information about technology is being disseminated is through the use of video tapes. Despite the different approaches, a common denominator exists between programs. All concentrate on educating faculty about technology and its use.

Considering the current state of programs designed to improve faculty performance in the technologically delivered, distance education classroom, all methods seem to be inadequate. The 1989 Office of Technology Assessment's (established by US. Congress) report suggests, "few teachers have found ways to exploit the enormous potential which

[57] Hakes, Sachs, Box, & Cochenour. (1993). Compressed Video. The Association for Educational Communications and Technology. Assocation for Educational Communcations and Technology.

[58] Beaudoin, M.. (1990). The instructor's changing role in distance education. The American Journal of Distance Education, 4(2).

[59] Van Berkum, Dennis, Euller, Judith A., Flack, Jan A., Johnson, Jean M., & Schepp, Julie. (1993, Spring). Teacher Training Workshop Manual: North Dakota Interactive Video Network. University of North Dakota.

interactive technologies offer" (p. 18).[60] Considering these findings, "Without the teacher's roles of redescription and adaptation, the method [the teacher's choice of teaching methodology: lecture, discussion, group work, etc...] remains at risk of failing to support learning" (p. 174).[61] Instructors' failure to use technology appropriately means students cannot learn what is intended. The question is how and where to create an opportunity for meaningful involvement, professional development and institutional support, to facilitate change of the OTA's findings? Based on the understanding of change and its impact on behavior and learning, it is clear that any program designed to address the issues of technological change at the university level needs to address two major concerns. The first concern is to ease faculty members into change by alleviating any fears and demystifying the technology. Secondly, the faculty must be educated about how to use the equipment as well as effectively design and present course materials using technology. The question then becomes how do we accomplish these objectives?

Facilitating Change

The first objective of programs designed to improve faculty performance concerning distance education and technology is to induce change with minimal resistance. Preventing resistance is done by helping faculty through the change process. Helping faculty adjust to the new physical and instructional environments attempts to eliminate or minimize discomfort caused by change. Keeping faculty feeling comfortable in their environment will also affect their attitudes toward the use of technology in distance education. If their attitudes are positive, then faculty will be more receptive to the changes resulting from technology than if their attitudes are negative. However, in order to design a program to help faculty through change, one needs to understand how people change. An understanding of how people change should give insight into an approach to help faculty.

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[60] Gooler, Dennis. (Ed). (1989, March). Preparing Teachers to Use Technologies: Can Unversities Meet the Challenge? Educational Technology.

[61] Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

Searching for knowledge about how people change is complex. There are various views on how to facilitate change. Some researchers contend that the key to successful change is through one's surroundings; one's social networks. An approach to implementing change through social networks could be the diffusion, or spread, of innovation through "opinion leaders, those persons (or institutions) to whom others turn to for advice" (p. 5).[62] Others approach change with a Rational Approach, or as "a process of solving problems." The Rational Approach to change is "something is not going right, so we diagnose the problem, set some objectives, find a solution, make a decision, implement it and evaluate its worth" (p. 6).[63] A political approach is yet another way to approach a process of planned change. This approach plans change politically by devising a formal decision making system or governance. Regardless of which approach is taken, "Implementation of technological innovation rests largely on readiness for change..." (p.15).[64] When considering a program designed to ease faculty into the use of technology, those who are not ready to change need to be included. Those who are not ready must be made ready. The question then changes from how do we facilitate change to how do we make people ready to change?

Research indicates that when looking at change on an organizational level:

> There is already a great deal of knowledge about how to make change work effectively at the work unit or project level...for the acceptance of change it is important that there is shared vision or shared goals to which people are committed; there is participation of the users in the process of implementing change; there is ample training so that people acquire the skills; there are transition periods to ease people in where the new and the old exist side by side; and there is ample communication and humane redeployment if the implementation of new technology costs jobs or creates displacement (p. 16).[65]

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[62] Day, Chris & Bell, Les. (1991). Managing the Professional Development of Teachers. Buckingham, England: Open University Press.

[63] Lindquist, Jack. (1978). Strategies for Change. Berkeley, CA: Pacific Soundings Press.

[64] Moss Kanter, Rosabeth. (1991). Improving the Development, Acceptance, and Use of New Technology: Organizational and Interorganizational Challenges. In People and Technology in the Workplace. National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council: National Academy Press.

[65] IBID.

Business and industry therefore not only train their employees but they address human difficulty with change by giving the work unit or project level some control over the change. In order to implement change in a work unit such as a university department, or on a project level such as a graduate program supplied to distance sites using technology, the organization must provide the members of the unit a set of shared goals, participation in process of implementing change, training, and ample communication. If the organization cannot provide these conditions, then change will be difficult. All these components address issues that affect human response to change. By addressing these issues of change, the work unit or project level effectively adapts to technology.

If implementing change has a proven method of introducing technological change, then why is the process of change so difficult for universities? A contributing factor, in addition to factors of individual response to change, could be "...that resistance to change is observed more often in the organization than in its employees" (249).[66] Organizations show their resistance to change through allocation of money and recognition:

> ...organizations seldom acknowledge changes in employee skills, tasks or standards with changes in job titles, job descriptions or grades, or pay. They are reluctant to invest in training and learning resources that would better support employees' use of advanced tools (Mankin et al., 1988) (p.249).[67]

University faculty members get their professional status through the university's organizational system of job titles and pay. So if the university neglects to invest in the training and learning resources or maintaining innovations this could reaffirm the faculty members reluctance to abandon tried-and-true methods for innovation. It is important to recognize the importance of the organization in implementing change because its role directly affects the response of the faculty. Unfortunately, in regards to college and universities,

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[66] Bikson, T.K. & Eveland, J.D. (1991). Integrating new Tools into Information Work: Technology Transfer as a Framework for Understanding Success. In People and Technology in the Workplace. National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council: National Academy Press.

[67] IBID.

...there has been little systematic study regarding how they [colleges] change.(1) The studies which do exist mostly conclude that colleges resist changing academic practices; what little change does happen occurs more by external pressure than internal plan." (p. 15) [68]

Because the use of technology at the university level is a response to societal, outside pressures, implementation is often quick. The speed of implementing technology is a result of the mutually rewarding relationship among the students and the university. Students benefit from opportunity of education and the university benefits by increasing enrollment. The situation is not that the university does not prepare for the implementation of technology, through training and development, but that due to the speed of the implementation, the monetary commitment beyond the hardware and immediate use remains unseen. For this reason, the university must address the changes resulting from external pressures with internal policy and commitment to change. However, how to address the changes resulting from external pressures is complicated by the fact that:

No general model has yet emerged to solve the multitude of problems associated with generating and maintaining effective teaching in as complex a setting as a university (p.94).[69]

Therefore, a program must be devised to suit the individual organization. Each organization is really starting from vacuity and must create or adapt a model that can solve a multitude of problems.

Existing programs attempting to address the impact of technological change using video tape and in-service workshops try to address the issues of technology for faculty. However, research indicates that faculty attitudes are still negative; "On an average, respondents were moderately negative toward personal participation...(p. 25).[70] It may be the case that current methods used for training and to improve faculty performance concerning distance education and technology fail in addressing a common element of

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[68] Lindquist, Jack. (1978). Strategies for Change. Berkeley, CA: Pacific Soundings Press.

[69] Mathis, Claude. (1979). The University Center. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[70] Clark, Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education..

change; the human element. University faculty react to change as people and not necessarily teachers, because before they are teachers, they are people. When designing a program to improve faculty performance when using technology as a delivery system for distance education, a model that is sensitive to the human aspects of change could be advantageous. One model, the Faculty Development Model, concerns itself with the role of faculty members as people as well as professionals. Considering the fact that a key objective for a program designed to help faculty through change addresses issues such as the discomfort of change and the fear of technology, issues that are people issues, the Faculty Development Model lends itself to such resolve. This model combined with several other approaches to programs designed to improve faculty performance is a forum where all the aspects of change from technology in Distance Education can be addressed; a place where the university can influence how faculty perceive technology:

> ...when we speak of the challenges of a given environment or the need of a given society, we must beware of thinking in terms of purely objective, exogenous factors. The challenge counts insofar as it is perceived by man, and what matters is how it is perceived (p. 18). [71]

Faculty Development is the way to address issues that were overlooked during initial implementation; issues of titles, compensation, and training. It is a forum to distribute the shared vision to the units of the organization and help those who are not ready to change become ready to learn. The answer to the question of how to promote faculty change is therefore, Faculty Development.

Approaches to Improving Faculty Performance

As there are different approaches to facilitate change, there are different approaches to programs designed to improve faculty performance. Some universities attempt to improve faculty performance with an individual approach. These approaches are designed for use when a faculty member seeks their own development. Methods used in this

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[71] Cipolla, Carlo M. & Birdsall, Derek. (1979). The Technology of Man. New York: Holt, Rinehart, and Winston.

approach include: apprenticeship programs, development centers and courses. Apprenticeship programs are when seasoned faculty members serve as mentors or role models to newer, younger faculty. Courses can be designed for specific development needs and the establishment of development centers that are designed as a resource for those who want to use them. Another approach to faculty improvement is based on groups. It is likely that the group approach is valuable in situations where interaction facilitates learning. The basis of this improvement is designed around the needs of the school as a whole; in-service workshops could be used with this type of approach. One last approach to faculty development is the organizational approach. With this approach, the organization coordinates the change.

The way the university views how people change determines which approach is taken. For instance, if the university believes that people learn best when knowledge is individually sought out, they may invest in a resource center for faculty. Such a system allows faculty members who are interested in development to seek it out on their own.[72] If the group approach fits the university's view of how people change more closely, in-service workshops may be implemented. Whatever approach used, the importance is in the design of the materials. The materials are the subject matter that will be presented to faculty. These materials and the needs of faculty must match or efforts will be ineffectual.

Training

Often, educational technology is complex and confusing, if it is not used effectively. The exchange of information, the education process, is at risk. Therefore, it seems necessary to provide training. Training will educate faculty members about how to actually use the technology. This practical knowledge of the technology should heighten faculty understanding of how the technology actually impacts their methods of teaching. Training will also build their confidence and further dispel any fear or ideas that technology

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[72] Bell, Les & Day, Chris. (1991). Managing the Professional Development of Teachers. Philadelphia, Pennslyvania: University Press.

is a mystifying force. Confidence can only aid in the effective use of the technology and therefore ensure the exchange of information. If training is effective, faculty will begin to view technology as a tool rather than a threatening, "here today, gone tomorrow" innovation.

Clearly faculty development and training have different objectives. Yet both affect the exchange of information and are therefore necessary to the effective use of technology in education. It is therefore wise to include training as a part of any program designed to improve faculty performance concerning distance education and technology. The difference between programs designed for faculty improvement and training is the practical approach required for training. Training relates to the procedures of technology, whereas programs for improvement of faculty performance can be multi-faceted programs that intend to go beyond the physical use of technology; to explain and demystify all the factors which the change affects.

Designing An Effective Faculty Development Program

Two current methods of faculty performance improvement with regards to distance education and technology are video tape and in-service workshops. The educational community believes that theoretically, both video tape and in-service workshops can work. Current research indicates that video tape and in-service are not producing the results that might be theoretically expected.[73] This may be because the programs are poorly designed. The key to a successful faculty improvement program is to design the content of the development to expressly fulfill the objectives of the program. To take this even further, it may be the case that current methods used for training and to improve faculty performance concerning distance education and technology fail in addressing a common element of change, the human element.

As previously discussed, the Faculty Development Model considers the human aspect of the university professor. Furthermore, it allows the design of a program to improve performance to go beyond the teaching aspect of technology and offer other areas for the university faculty member to improve. The following are design suggestions for a faculty performance improvement program using the Faculty Development Model.

Faculty Development Model

A program dealing with the use of technology for distance education needs to first ease faculty members into change by alleviating any fears and demystifying the technology. Secondly, the faculty must be educated about how to use the equipment, as well as effectively design and present course materials using technology. Three components that will structure a faculty development program to fulfill the above objectives are I. Organizational Development, II. Instructional Resources Development, and III. Instructional Development. These components can be tailored to fulfill specific objectives.

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[73] Clark, Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education..

For instance, Instructional Resources Development programs usually attempt to increase the quality, range, variety and flexibility of teaching resources used by professors and students. So this type of program not only directs faculty how to improve their use of technology but also expands their knowledge of the possibilities available. For instance, such a program might guide faculty to develop a back up program if the technology fails. (Use an existing audioconferencing system if the interactive video system is inoperable). Another component could be Instructional Development which is designed "to improve the design and method of teaching" (p. 4).[73] This type of program would address the impact of technology on instructional issues such as pedagogy, course design, and methodology. And finally Organizational Development, a third component, serves the purpose "to create an organizational setting conducive to and supportive of teaching improvement" (p. 4).[74] A "conducive and supportive" environment for teaching improvement involves a:

> ...personal development of a concern for the "human side of enterprise," the ways in which faculty members and administrators relate to one another in the process of identifying and reducing obstacles to more effective institutional functioning (p. 13).[75]

Faculty and administrator relations include organizational functions such as "acknowledg[ing] changes in employee skills, tasks or standards with changes in job titles, job descriptions or grades, or pay" (p. 16).[76] All three of these programs can be integrated, along with the training, into one faculty development program that will address issues of change concerning the faculty, university and instruction when using technology for distance education.

Another asset to the faculty development model is that "faculty development is concerned with the many roles faculty have in the institution they serve--not just their role

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[73] Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[74] IBID.

[75] IBID.

[76] Moss Kanter, Rosabeth. (1991). Improving the Development, Acceptance, and Use of New Technology: Organizational and Interorganizational Challenges. In People and Technology in the Workplace. National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council: National Academy Press.

as teacher" (p. 98).[77] This way the development treats faculty as people rather than as instruments of teaching. Faculty development based on the Faculty Development Model is the appropriate program to supply the information. Components of a faculty development program can be designed to fulfill specific objectives.

I. Organizational Development

Organizational development is where "Institutional diagnosis, feedback, action-planning, team-building, training, and formative evaluation regarding such matters as institutional goal clarity and accomplishment, effectiveness of interpersonal and group processes, role definition and support" take place.[78] "They have in common with personal development a concern for the "human side of enterprise," the ways in which faculty members and administrators relate to one another in the process of identifying and reducing obstacles to more effective institutional functioning" (p. 13).[79] This kind of development addresses the need for the break down of barriers that may exist between university administration and faculty. Breaking down such barriers is important because:

> Many programmatic efforts to improve college teaching fail not because they are ineffective, but because the institution and professional associations do not really support teaching improvement. The system is against it. Faculty members too often get behind instead of ahead by concentrating on improvement of their teaching, for the payoffs are elsewhere. Some institutional leaders penalize faculty risk-takers and experimenters rather than encourage them. Many institutions simply allow no time to develop and refine some new approach. Professional development leaders quickly find that their job is institutional change as well as individual assistance (p. 13).[80]

Development leaders are simply the people chosen to design a program for improving faculty performance. As this development designer submerges his/her self into the design

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[77] Mathis, Claude. (1979). The University Center. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[78] Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[79] IBID.

[80] IBID.

process the root of the problem turns out to be the institution. So in order to prevent this type of environment, an organization can determine whether or not it is providing a positive attitude towards faculty development by answering the following questions:

> ... we can pose several questions that a teaching improvement leader might ask about his program. Do we have time, material resources, skill and activities which enable faculty to learn together about themselves and about their students as developing persons? Do we have the time, money, skill, and activities to help faculty resolve the personal concerns they and their students have? Do we have equally effective means for learning together about teaching and learning problems as well ... means for improving the content and method of instruction? And are we effective in asserting the organizational conditions which encourage and inhibit effective teaching and learning as well as in aiding the improvement of that situation? (p.22) [81]

Even though these questions are posed in order for the teaching improvement leader to assess whether there are enough resources available to design a successful program, they are also applicable to the organizational assessment of commitment. If the organization is not willing to support all of the issues raised by the teaching improvement leader, then it is likely that the improvement leader will design an ineffective program due to the lack of resources and positive environment. Organizational development is also where issues such as ample communication and compensation should be addressed. In the case of university faculty, compensation is not necessarily only monetary, but may be directly linked to the individual's status and prestige. So if a university becomes a leader in the area of using interactive video as a distance education delivery system, the faculty members using this technology become leaders in their knowledge about the system. The respect the university receives trickles down to the faculty. Without this commitment of resources on behalf of the university, an effective program designed to improve faculty performance with the use of technology will be difficult to provide.

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[81] IBID.

II. Instructional Resources Development

After a commitment of resources and positive environment are provided by the university, the next component to a thorough design for faculty development program is to ready faculty for learning. Wilbert McKeachie suggests nine guidelines to ready people to learn (see Appendix A). These guidelines address issues such as treating faculty as active learners, using social environments to provide information, identifying specific needs and goals and making faculty self aware. Getting faculty ready to learn as a part of Instructional Resources Development is important because it would be the first place where faculty are formally given specific information about technology. Organizational Development happens in a less formal way than Instructional Resource Development because it is more of an assessment of conditions rather than a forum to present issue. Instructional Resource Development is where faculty are going to learn about technology so it is important that they be ready to learn. Instructional Resources Development usually concerns itself with "provisions of technological or prepackaged teaching aids and assistance in using them" (p. 4).[82] This form of development can easily be modified to include technology as a delivery system. Each component of the use of technology would be considered a teaching aid. For example, one aspect of development might focus on the appropriate use of the overhead camera in an interactive video classroom. Another aspect might include other existing teaching aids that can be used as a complement to the delivery system. For instance, subject matter of Instructional Resources Development might address whether moving video can be used with an audiographics system, or whether one can use color slides in the classroom? This kind of knowledge affects the way in which the faculty member may approach the design of course materials. Effective presentation in education is important because if the material is not presented clearly, the learning process may be lost for some students. This scenario is true in any educational setting; including

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[82] Bergquist, William. (1979). The Liberal Arts College. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

traditional classroom education and classrooms using technology. Instructional Resource

Development is necessary for faculty to understand how to use the technology.

It has already been established that training is necessary for a successful program.

One way the Instructional Resource Development component can be enhanced is through

training. Training is important because "...there is increasing recognition that new

technologies are often underused or inefficiently used..." (p. 2-3).[83] Training to use

educational technology properly could avoid inefficient instruction. Faculty training would

teach them "to learn how to integrate technology into teaching in such ways that they are

freed to concentrate on the most difficult and complex aspects of helping students to learn"

(p. 8).[84] As with the design of a faculty development program, experts in training

ascertain:

> The solution lies in the adoption of a design process which begins with the identification of needs, and progresses through the definition of objectives for individual course units, to the selection of subject matter and the choice of the instructional media. Trainers must approach each assignment with firm control over their own assumptions and preferences. They must seek to learn first what is to be achieved and why. From this they must define the specific steps or goals to be gained, with whom, and where and when. Only then can they select the most appropriate methods, or combinations of methods, to accomplish the task (p. 3).[85]

Particular attention needs to be paid to the design of training or efforts will be wasted.

Designers suggest the following approach to such training:

1. Designing instructional objectives which specify levels of competency beyond the minimal.
2. Providing for individual choice in methods used to attain objectives.
3. Flexible scheduling of training sessions to allow for diagnosis and remediation (p. 102).[86]

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[83] Laumann, Edward O., Nadler, Gerald, & O'Farrell, Brigid. (1991). Designing for Technological Change: People in the Process. In National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council. People and Technology in the Workplace. National Academy Press.

[84] Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

[85] Young, Donald A. (1973, January). The Trouble with Training Today. In Training in Business, Industry and Government. Engle Cliffs, New Jersey: Educational Technology Publications.

[86] Mathis, Claude. (1979). The University Center. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

Designers who focus on planning training programs in regards to technology further suggest a "hands-on" approach. The effectiveness of this approach is the fact that the student, in this case the faculty member, can experiment with the equipment. Once faculty have learned how to use the technology and understand how all its components work together, they will be "freed to concentrate on the most difficult and complex aspects of helping students to learn" (p. 8).[87] These issues fall under the guise of instruction. It is important to note that because training teaches faculty how to use the technology, it is probably beneficial to provide it before faculty have to teach students with it. If faculty have to use technology without being trained, it is likely that they will be intimidated by it and form opinions about its effectiveness without knowing the potential of its use.

III. Instructional Development

Once faculty begin to understand both the uses and issues of technology, the instructional concerns of course design, curricula, pedagogy, and the impersonality of technology can be tackled. Instructional Development is an appropriate approach for this type of information. Instructional Development in a general sense focuses on the instructional issues that faculty face. It is this kind of development that is often used to urge the use of teaching innovations and provide "technical assistance to professors and departments in the diagnosis of teaching improvement needs and the design, method, and evaluation of teaching solutions" (p. 4).[88] Because this type of development already tends to concern itself with issues unrelated to technology such as increased preparation time due to an increased number of students, presentation dynamics, interaction with students, and pedagogy and curricula, it is only logical to use this approach in regards to technology. Methods for instruction and pedagogy must be adjusted in the minds of the faculty so that they can make the best use of the technology. Instructional Development can be modified

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[87] Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed).
Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the
Advancement of Small Colleges.
[88] IBID.

to address instructional issues with the inclusion of technology: increased preparation time and number of students, impersonality caused by distance, interaction between the on-campus and distant sites, and pedagogy and curricula. The content of this approach would remain relatively the same, but would include the affects of technology.

According to William Bergquist, co-author in *Designing Teaching Improvement Programs*, a "change in the design of an entire course or use of a new instructional strategy"[89] will have the following affects on the faculty member:

- Faculty member often changes image of self (role): becomes instructional designer or manager rather than information giver. Temporary feeling of no longer being valuable to students.
- Faculty member is temporarily more busy, than less busy.
- Faculty member is likely to temporarily experience some failures, student dissatisfaction and confusion (p. 50).[90]

To address these issues, Bergquist asserts that instructional development would need to provide "long-term design consultation," Instructional innovators' support group," "Peer consultation," and "organizational development." (p. 50).[91] These are activities currently needed for instructional change. As with the approaches already discussed, the information which appears in each segment needs to be carefully designed to ensure its appropriateness and effectiveness.

Designing an Effective Faculty Development Program in Summary

It is clear that the Faculty Development model including components of Organizational Development, Instructional Resources Development, and Instructional Development addresses the issues that surface with the implementation of technology as a delivery system for distance education. This type of design pays careful attention to the intricate relationship between education, university and university faculty. Each component provides a forum to consider the human aspects of change as well as changes to

[89] Bergquist, William. (1979). The Liberal Arts College. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.
[90] IBID.
[91] IBID.

environment, instruction and the university which affect faculty members. Now that a forum has been designated, it is imperative to look at how to design the materials within each component.

Designing Effective Materials

The design of any program, whether it be a faculty development program or a training program must follow very specific design principles. Since much of the overall objective of a faculty performance improvement program is to educate, it would seem appropriate to consult instructional design principles to design the program. In this researcher's review of the design literature, no single method appeared to adequately consider all the variables necessary to an effective design process for faculty development programs. Design experts contend an effective design must "seek to learn first what is to be achieved and why," "define the specific steps or goals to be gained, with whom, and where and when," and then "select the most appropriate methods, or combinations of methods, to accomplish the task" (p. 3).[92] A design model proposed by David L. Smith in his book *Video Communication: Structuring Content for Maximum Program Effectiveness* addresses all the above issues. Smith's model provides a means to define goals based on needs and audience characteristics and provides an order in which these goals are considered. The design strategy not only focuses on the content of the topic, but it also considers the best ways in which to reach its audience. The breadth of this design method makes it flexible enough to apply to all components of the proposed faculty development program: Instructional Development, Instructional Resources Development and Organizational Development as well as the materials that are needed within each segment (The author recognizes that other methods may meet these needs, but suggests that Smith's model applies sound principles in a logical and systematic manner). Smith's model consists of the following questions:

> What is the purpose? Why make this program?
> Who is the target audience? Describe them.

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[92] Young, Donald A. (1973, January). The Trouble with Training Today. In <u>Training in Business, Industry and Government</u>. Engle Cliffs, New Jersey: Educational Technology Publications.

What is your communication objective?
What is the subject matter?
What is the most appropriate format for this program?
What are the program elements?
How/where will this program will be used?
Where is the target audience?
What are the financial considerations?
What equipment and facilities will be used?
What locations will be involved in the production?
Who will be involved in the production?
When will the production occur and be completed?
How will the success of the program be measured? What criteria will be
   used? (p. 144-163).[93]

These kinds of questions will aid in the development of a program and materials that will be relevant to the purpose of the entire program. They will also keep the content focused on what is relevant to the faculty member. This design model also takes into consideration principles that will present the materials in a manner that stresses the importance of the development without losing the interest of its audience. Audience analysis is used in content development because it can aid in determining what issues are actually important to the faculty as well as how to best approach its presentation. The answers will be different at each university, depending upon their faculty, the technology they're implementing and resource availability. To find the information to customize the content of a development program for each organization, the answers are in research and development. Once purpose, audience characteristics, and content are determined and an appropriate communication objective formulated, Smith's questions guide the designer through a series of practical considerations including format, cost, technical considerations, and an evaluative process. Careful use of this method should result in a well defined, clearly focused development program and an evaluation of its effectiveness.

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[93] Smith, David L. (1991). Video Communication: Structuring Content for Maximum Program Effectiveness. Belmont, California: Wadsworth Publishing Company.

Smith's Model of Program Design

What Is the Purpose and Why Make This Program?

The question, "Why make this program?" really refers to identifying the problems. Human resistance to change, a possible fear of technology, inadequate funding, and the lack of understanding of technology for the university and university faculty members are all problems that impact the design of a faculty development program. To ensure success, these aspects of the problem need to be considered in the design. Addressing these problems will aid faculty to make successful use of technology for distance education.

Once the answer to why we need to develop this program has been determined, a clear purpose can be developed: help university faculty members deal with the changes resulting from the implementation of technology for distance education and to train them to use the technology effectively. Since university faculty do not typically understand technology and how it works, the importance of this program lies in the educational process. If university faculty cannot embrace the changes positively, then they will not be able to learn from their new environment. Inability to learn will prevent them from using the technology effectively and in turn affect the learning process for students. If this happens, the whole idea of distance education is defeated because distance education exists for students to get a quality education without relocating. Education and training will help university faculty embrace these changes and will therefore, help preserve the educational process. The purpose of this program is: (1) ease faculty members through change by alleviating any fears and addressing unsound perceptions of technology and (2) educate faculty on how to use the equipment and effectively design and present course materials through the technology.

Who Is The Target Audience?

"Because the audience is central to all mediated communication, it should be addressed immediately after the purpose is known" (p. 145).[94] Once the purpose of the program is known the question is to identify who the program should be designed to reach. "The more that can be known about those whom will receive the communication, the greater the likelihood the communication will be received and effective" (p. 146).[95] The audience is the primary group of people at whom a message is aimed. A target audience is made up of people whose characteristics have been identified and studied (p. 173).[96] The way to define one's target audience is to determine both demographic and psychographic information about the audience. Demographic information consists of data concerning "gender, education, geographic location, and audience size" (p. 146).[97] Psychographic information consists of the audience's "preferences, perceptions, habits, values, and life-styles" (p. 174).[98] These bits of information are helpful when determining the information the audience needs and how to present it. For instance, research may indicate that university faculty respond favorably to the opinions of their peers. It may be advantageous to consider this type of data when selecting a program format. A panel discussion of carefully selected peers may be the best way to present subject matter to the audience. Research indicates that faculty need to be to eased through change and trained. In order to ease faculty through change, an assessment of what faculty know and their perceptions of what they know is needed. These perceptions accompanied by research will determine specific program objectives. There are several ways in which such perceptions can be gathered: personal interviews, focus groups, discussions, and surveys.

Since each university is different, the make up of each organization's faculty is also different. For this reason the audience needs to be assessed at each institution. However,

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[94] IBID.
[95] IBID.
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[97] IBID.
[98] IBID.

since we are talking about a group of people who in a sense have the same job, and work under similar organizational situations, there are a few characteristics that are probably generalizable across the entire group. Faculty may be critical, analytical, skeptical of television, mistrustful of administrators, or uncertain about technology. These factors should be considered in the design of materials for faculty development programs. Research can determine to what degree these or other descriptors apply to a general faculty population. A designer then tailors content and style to accommodate these characteristics. For example, it is known that:

> Faculty are meticulous about their research methodology and the results obtained, and they take pride in their service functions. Most of them would like to take equal pride in their teaching. They rely on past experiences and role models which may or may not be appropriate for what they are attempting to achieve. They know that they are not as proficient as teachers as they are practitioners of their disciplines, and some are defensive and resistant to efforts to modify their teaching behavior (p. 193).[99]

It may be advantageous for the program designer to have established practitioners rather than a polished moderator present the subject matter to faculty. In doing this, faculty may be more receptive to the information presented.

Audience also affects how the subject matter is presented. For instance the same layout in *Rolling Stone*, a magazine that appeals to males 18-25, may not appeal to the audience above the age of sixty-five. A design for college students would probably be flashier in order to catch the eye, whereas, for a university faculty member who is attempting to learn a specific skill, the subject matter would be more important than visual aesthetics. The same is true for faculty, the physical design and presentation of subject matter would be different for university faculty than it would be for college age students.

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[99] Burke, Peter, Heideman, Robert, & Heideman, Carroll. (Eds.). (1990). Programming for Staff Developments. London, England: The Falmer Press.

Communication Objective

The communication objective is different from the purpose of the program because it is more specific. The communication objective asks, "what will the finished piece *communicate* to those who experience it?" (p.146).[100] The communication objective of a faculty development program is to persuade them to view technology as a tool that should not be feared, and through training, to understand that technology, if used effectively, can provide quality, university education off-campus. This objective provides a focused perspective to which all further decisions can be referred--a kind of development compass to guide the designer throughout the design process.

What Is The Subject Matter?

The subject matter is the actual content of the program. This information needs to be tailored, through research of the audience, to fit the organization's approach to faculty development. There are a variety of different ways to gather the subject matter. What faculty actually know and their perceptions of what they need to know needs to be assessed. Personal interviews, focus groups, discussion sessions, surveys, questionnaires and tests are all ways of obtaining this data from university faculty. It is important to consider this type of information when designing a faculty development program because it can prevent the content of the program from being too basic or too complex. These methods of gathering information can act as a filter for what to include and what not to include in a faculty development program.

Subject matter also includes information derived from literary research. Once the information is gathered it is important to assess whether the information is true, what order it should be positioned in the program, whether the message is clear and who benefits. This assessment will structure the overall design of the project by determining what formats and elements are appropriate in the presentation of the materials.

[100] Smith, David L. (1991). Video Communication: Structuring Content for Maximum Program Effectiveness. Belmont, California: Wadsworth Publishing Company.

What Is The Most Appropriate Format For This Program?

"Program format is essentially the structure within which content elements are organized and presented" (p. 154).[101] Current efforts in faculty development for the use of technology center around in-service workshops and video tape. Numerous other methods which might be used to deliver the content of faculty development are represented in Figure 1 (see Appendix B). Though these are formats for development programs, most are not often used for faculty development in regards to the use of technology. Though video tape and in-service are the most common current formats for delivery of faculty development with technology, there is some indication that these formats have not been entirely successful.[102] A careful look at both video tape and in-service workshops as formats for faculty development may reveal the reasons for their perceived inadequacy and why these designs are not successful when attempting to address the issues of the use of technology for distance education.

In-service Workshops:

In-service programs have been around in education for at least 130 years.[103] For this reason, their use has become a standard. Because in-service is perceived as a standard, faculty, "want in-service education."[104] "Teachers want to continue to improve; they want to be current."[105] The intent of in-service programs is:

> ...a process of working toward change. Viewed in terms of human behavior the changes are ordinarily identified as gaining new knowledge, increasing understanding, acquiring more desirable terms of materials, media, and knowledge itself, changes may suggest exploration, evaluation, modification, amplification, and elimination. All of these latter processes, also implying personal involvement, both

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[101] IBID.

[102] Clark Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education.

[103] Tyler, Ralph W. (1971). In-Service of Teachers: A Look at the Past and Future. In Rubin, Louis J. (Ed). Improving In-Service Education: Proposals and Procedures for Change. Boston, Massachusetts: Allyn & Bacon, Inc.

[104] Edelfelt, Roy A. (1974, Fall). Inservice Education of Teachers: Priority for the Next Decade. Journal of Teacher Education.

[105] IBID.

contribute to behavior changes and lead to changes in administrative and teaching practices (p.12-13). [106]

In theory, in-service programs seem perfect to fulfill the objective of faculty development but "it is felt that in-service programs have been relatively inadequate and have not really served the major purposes of improving professional performance" (p. 28).[107] Instead of blaming improper design, critics blame the method. For the most part, the problems consist of:

1. Failure to relate in-service program plans to genuine needs of staff participants.
2. Failure to select appropriate activities for implementing program plans.
3. Failure to implement in- service program activities with sufficient staff and other resources to assure effectiveness (p. 4).[108]

Clearly, this criticism indicates that in-service workshop programs may not adequately consider their audience and fail to address the needs of the faculty and select appropriate activities. The failure to provide sufficient staff and resources is a factor related to the organization and the learning conditions of the university as an environment. If these in-service designs had provided adequate resources and considered their audience, the programs might have been more likely to succeed. Application of the Smith analysis and design method would lessen the likelihood of those flaws reoccurring in the design of in-service programs.

Video Tape:

It is the author's observation that video tapes intended for faculty performance improvement related to technology, subject matter has a few common themes: descriptions of media services available to faculty, the strengths of various technologies, the benefits of distant education, and other information encouraging faculty to use technology. Video

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[106] Fishback, Woodson W. (1968). In-Service Education Considerations--Psychological factors. In Patel, I.J. & Buch, M.B. (Eds.). Readings in In-Service Education. India: Anand Press.

[107] Bowman, Barbara. (1976). Analysis of a Teacher Inservice Education Model Desgined to Change Teacher Performances and Attitudes. Dissertation for Doctorate at Michigan State University. East Lansing, Michigan.

[108] Harris, Ben M. & Bessent, Wailand. In Colloboration with McIntyre, Kenneth E. (1969). Inservice Educaiton A Guide to better Practice. Englewood Cliffs: Prentice Hall, Inc.

tapes may also emphasize the value of collaborative efforts among faculty, media developers and university administrators.

There are many advantages to using video tape as an informational tool. This is apparent in Smith's design model. The definition of an instruction is, "...communicat[ing] a specific piece of knowledge or a specific skill to particular person or group" (p.xii).[109] The video tape as an information vehicle is able to accommodate the prospective content. Furthermore, videotapes seem to be effective for such a task:

> ... [a] study conducted by Deutschmann, Barrow, and McMillan who compared the effect of different modes of communication upon relative learning of relevant and irrelevant information. The study concluded that the television film instructional situations are more efficient than the ordinary classroom instruction because more irrelevant material is screened out" (p. 9).[110]

To further this conclusion, "Williams, et al (1957), compared the live lecture, televised lecture, radio lecture, and written version of an instructional program. Television was rated highest in achieving learning goals..." (p.15).[111] Though this research refers specifically to television, most experts argue that the only difference between video tape and television is "...in the self-pacing provided by greater learner control, which at least allows students to reflect on the interaction they have witnessed (p. 118).[112] Allowing the learner to have control enables the learner to pause or stop the tape for assessment of materials. Video tape effectively replaces any information that can be delivered in a lecture style format. More recent studies confirm the 1957 findings of Williams et. al., "Schwarzwalder (1960) concluded that students learned more from watching programming that showed visual organization and continuity as well as visual reinforcement" (p. 17).[113] "Joan Teirney

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[109] DeLuca, Stuart M. (1991). Instructional Video. Boston, Massachusetts: Focal Press.

[110] Deutschmann, Paul J., Barrow, Lionel C., Jr., and McMillan, Anita. (1961, November-December). The Efficiency of Different Modes of Communication. AV Communication Review, IX.

[111] Williams, D.C., Paul , J., & Ogilivie, J.C. (1957). Mass Media, Learning, and Retention. Canadian Journal of Psychology, volume 11.

[112] Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

[113] McCarthy, Tom. (1991). Right Way/Wrong Way" Presentations--The Use Of Common Errors In Instructional Videos For Procedure Learning. Masters of Arts Thesis from Michigan State University. East Lansing, Michgan.

(1980)...concludes that television's attention-gaining devices and ability to actually display material visually demonstrates its teaching capacity" (p. 16).[114] This is shown in video's ability "...to bring together experience and description of that experience, and being self-paced, can enhance this further with the opportunity for students to reflect on what they are doing" (p. 117).[115] Thus, one can say that video tape is a proven medium for effective dissemination of information. Video tape is a way to learn about a new environment indirectly.

There are still other advantages to the use of video, "message consistency," "flexibility," and "cost" (p.19).[116] Consistency of message refers to distributing the exact same information to each viewer. Video tape ensures that the message content is always the same. Copies of the video tape allow for simultaneous, multiple users who have the luxury of viewing the tape at their own leisure. Thus, video tape is flexible. "Consistency and flexibility complement each other by giving all viewers the same information and message at different times appropriate to company and/or individual needs" (p.19).[117] Both these ideas point to the cost benefits of video tape. More practically put:

> Best of all, you only have to do it once. You might spend twenty or thirty hours producing a ten-minute video, but you can use that video over and over again. You can disseminate it to hundreds, even thousands, of students [or faculty] by broadcast or cable television, and it will be just as good the last time someone sees it as it was the first time" (p. 9).[118]

The cost of producing a video tape is a one time cost. The cost of producing the video tape depends upon many variables: who produces the tape, who writes the tape and production design. The cost for universities is often economical because universities have more resources than a company. Many universities have their own production facilities. A

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[114] IBID.3

[115] Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

[116] Degen, Clara. (Ed.). (1985). Understanding and Using Video. New York, New York: International Association of Business Communicators, Longman.

[117] IBID.

[118] DeLuca, Stuart M. (1991). Instructional Video. Boston, Massachusetts: Focal Press.

university can delegate the task of gathering expert information for script content to the appropriate people already in their employment. A university's ability to minimize costs by utilizing resources within the organization is greater than most organizations interested in producing video tapes. Therefore, video tapes can be cost effective for a university.

However, the use of video tape as method of delivery for the objectives of faculty performance improvement is complicated by the fact that there are two different approaches to video tape design; instructing and training. An instructing tape would be a tape in which the content was more general, not concerned with any one technology. This tape would touch on issues that would encourage and inform faculty to use technology. This approach would treat technology as content because it would address the impacts of technologies on the important issues--adjusting to new physical climates, time management, and course redesign. It would not educate faculty on how to actually use technology. Conversely, a training video tape would specifically address the issues of how to best use one particular technology. This tape would explain in detail how to use a specific technology as an instructional tool, and would include advantages and disadvantages and how to best use a technology. This may include information such as what an overhead camera is and what materials are appropriate to use with such a camera.

One might suggest combining these two approaches, but again, video professionals caution:

> [O]ne common mistake in the development of an instructional video is to try to put too much into it. A video does not need to include everything that is known about a given subject. Rather, an effective video like an effective lesson, should include only as much information as the students are prepared to receive and absorb at one time (p.13).[119]

Clearly, a video tape attempting to address both the general concerns of technology in distance education and the logistics of how to use specific technologies as instructional tools would be too much. There are other concerns that question whether or not video tape is an effective method for faculty development. The flexibility and consistency of video

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[119] IBID.

tape does have disadvantages. With video tape, there is no way to track whether faculty are actually using the tapes. Video is a common medium, does making a video tape make the issues presented important to some one who might think otherwise; Or does the fact that it is a video tape give the perception that it might not be imperative, just helpful? Video tape makes consistency of information possible but there are also issues of the longevity of the product. If the video tape isn't produced with prolonged use in mind, its useful life may be short. For instance, if the equipment changes, the content becomes outdated. A tape designed to train faculty to use the technology could become obsolete if a new piece of equipment is introduced into the system or a new procedure deemed more effective. Video tape cannot be easily updated to accommodate major changes as, for example, print media can. Basically, the video tapes needs to be reproduced. This gives a new perspective on the cost effectiveness of the medium. Without proper planning and design, video tape can fail just as in-service workshops.

It is easy to design faculty improvement programs improperly. Video tape and in-service workshop serve are two examples of this. If one design issue is forgotten, there will be a flaw in the design and likely that communication will be lost. As already suggested, the design of the program is a progressive process. So far in our examination of this process, audience, subject matter, communication objective, purpose of program and the problem all affect design. If all of these principles are not addressed it is likely that the design will fail. This is why Smith has devised his model progressively. He is capitalizing on the interdependence of the issues involved in the design. By progressively following Smith's model, the design will succeed because it has taken all the possibilities into considerations and left no room for conjecture.

What Are The Program Elements?

Program elements are the materials that "deliver the content". These are materials used within the methods. A presenter, for instance, may use handouts or an overhead to

clarify and create interest in the topic. Other materials may include pamphlets, reference guides, overheads, slides, films, and computer programs. Such materials will contain the subject matter of the program. Since the subject matter is why the program exists, it cannot be stressed enough how carefully such materials need to be designed. No matter how much support and resources are given by the university, if the materials, the program elements, are poorly designed, the work is wasted It is then likely that objectives of the program will not be fulfilled. Using Smith's model, the materials are designed under the overall guidelines of the program. This extra attention to detail, tailoring all information to the faculty member, may make the difference between success and failure of the entire program. So when designing the materials, the designer needs to consider all the program elements available to him/her and decide which elements will reach the audience and present the material best.

How/Where and What Equipment And Facilities Will Be Used, Where Is The Target Audience, and What Locations Will Be Involved In The Production?

How and where this program will be used, needs to be determined to ensure that the video tape is designed with its ultimate use in mind. For instance, design considerations need to consider if the program is ongoing. The order in which materials are presented affects the design of the program. If the program were to address an in-service workshop session, one session a week and continue for four weeks, then the decision whether or not to review material from the previous sessions needs to be made. The issues of where the program will be presented is also a design issue. For instance, if the same four week program is scheduled to be held in four different places, the characteristics of each place need to be considered when designing the materials. If you plan on using a film, and the location where the program takes place doesn't have a projector, the design of the program becomes ineffective. When the material is going to be presented is also an issue. For instance, it has been suggested that training with technology

may be more advantageous to university faculty if supplied prior to use for instruction. This is an important consideration in the design process.

What Are The Financial Considerations?

Finances are often forgotten until after the entire design of a project is completed. This is a dangerous course of action because, as with any program, there are a wide range of costs, depending on the design. For instance, when designing a video tape, what formats and what program elements factor into the overall cost of the project. One-inch video tape is much more expensive that 3/4"; likewise it will cost more to have a celebrity host a program than some one who is an unknown talent. The same financial considerations are true when designing a faculty development program. If a university decides to have the faculty development program designed and implemented by an outside party versus university personnel, the costs will be different. Program elements are also a consideration in costs. In video tape for instance, it may cost more to have some one create animation for a demonstration rather than taping a live demonstration. In a faculty development program, program elements such as video taped segments or simple overheads have the same cost implications. Budget projections play an important role in the design of a faculty development program and should be considered as part of the design process rather than afterward.

Who Will Be Involved In the Production and When Will the Production Occur And Be Completed?

Who will be involved in the project is important. For instance, should a specialist be brought in to evaluate and diagnose the needed development; or is there a designer on staff who is adequately trained in faculty development? Decisions about the administrative duties are also important. It is imperative that those people who are ultimately responsible for the design and production of the faculty development program fully understand its

objectives, audience, content, elements, and financial considerations. They must also have the ability to design and implement such programs and this may require specialists with specific training and background in faculty development.

It is also important that enough time be allotted to both the design and production stages of the program. A timeline which allows enough time for adequate planning and for production of materials is essential. All too often such programs are created too quickly, without sufficient time for research, planning and adequate considerations of the complex issues around which quality design revolves.

How Will The Success Of the Program Be Measured? What Criteria Will Be Used?

As in any learning environment, it is important to determine the success of the lesson. Throughout education, tests are used to evaluate what and how much is learned and also how effective the communication process. Universities use course evaluations as a method of evaluation. This kind of evaluation provides an evaluative voice for the audience. The same needs to be done with faculty development programs.

Evaluation can measure many different aspects of a faculty development program such as the appropriateness of the subject matter or the effectiveness of its presentation. There are also different ways to measure this kind of information: one could conduct a pre-post test analysis of faculty's' knowledge before and after the development program. The results of evaluation can serve as references for future designs for improvement. Designers may be able to determine what information was useful and presented clearly, and what was not. Reference to this kind of information can allow for improvement future attempts.

Conclusion and Recommendations

This paper examines the many issues that surface for the university and university faculty when using technology as a delivery system for distance education. It has been determined that throughout time people have reacted adversely to change. One way to determine the severity of the reaction is through environmental assessment. Environment affects the way in which people respond to change by providing security and knowledge from which the individual learns. If environment changes, people experience discomfort. If discomfort is not overcome, then one is unable to learn from his/her environment. Learning is essential to adapting. If a person is unable to learn from their environment, he/she then becomes unable to adapt.

When examining the current state of education, the university and university faculty, it is clear that the use of technology as a delivery system for distance education will cause changes to the faculty members environment both instructionally and physically. Since university faculty are people, it is likely that they will respond to these changes. In addition to changes to their environment, technology complicates faculty reaction to its use because technology is often misunderstood and therefore feared or viewed as a mystery. All of these issues are important because they affect whether or not university faculty will be able to use technology effectively. If the technology is not used effectively, the education process, the communication exchange, can be jeopardized thus defeating the whole purpose of education.

To preserve the educational process faculty members need to learn about technology. A forum where the above issues can be addressed is in a faculty performance improvement program. A model that accommodates the issues and includes the human ramifications of change is the Faculty Development Model. Using this model combined with the components of Organizational Development, Instructional Resources Development and Instructional Development can be designed to: (1) ease faculty members through change by alleviating an fears and unsound perceptions of technology (2) educate

faculty on how to use equipment and effectively design and present course materials through technology.

To ensure the effectiveness of this program, a model for its design is applied. Smith's model of program design provides goals, a logical order to the design process, and considers audience. Audience definition provides a clear definition to the subject matter and the components of design. Organizational Development, Instructional Resources Development and Instructional Development are components that can be included to fulfill specific objectives of the program. Specific design of these components ensures the communication objectives and the audience are in agreement. This agreement makes for an effectively designed program.

Recommendations to the University

Based on the above research a list of recommendations has been devised. These recommendations address the problems facing universities and university faculty are presented in a four-fold manner. First: create a positive learning environment for faculty. Second, provide training. Third address instructional ramifications of technology, and fourth some general recommendations for designing a faculty development program.

The university plays a very important role in the lives of its faculty members and therefore, it only seems right that it play an equally important role in their professional development. In addition to the commitment of resources, there are many things that the university as a whole can do to ease faculty members through the changes brought on by new technologies:

- Careful choice of technology.

    It is important to chose the technology with the learning process in mind. Assess what the technology needs to do to accommodate its intended purpose rather than selecting the newest, most innovative technology that will not easily met the needed criteria of instruction. Make the technology fill the needs of the instruction rather than the instruction be modified to accommodate the technology.

- Assess how the university interacts with the faculty members. Does a learning environment exist?

> This assessment will determine how big of a commitment is needed by the organization. To determine this, the university will need to look at its relationship with its faculty members and assess whether or not it is supportive of their professional development. Depending on the assessment, the commitment may be as great as changing the relationship between administration and faculty or as little as simply channeling resources to the need. Since environment is a source of information, a positive environment will also aid in creating a positive learning environment.

- Include faculty in the process prior to implementation.

> Training professionals suggest that for acceptance of change it is important that, "there is participation of the users in the process of implementing change" (p. 16).[120] Depending on the organization, this participation could be as simple as allowing faculty members to participate in the decision-making process.

- Provide shared goals.

- Provide ample communication.

Recommendations for Training

- Train before they use it; orientation to the equipment

> If faculty are trained on the technology before they have to use it, this will decrease any problems with fear, mystification and misuse. Training will increase the faculty member's confidence in using the technology so its use will be approached more positively than without training. Also training will provide interaction with their new environment which will decrease the amount of their feeling of discomfort and instigate their ability to learn from the environment.

- Use a "hands-on" approach.

> Training with a "hands-on" approach will provide interaction with their new environment which will decrease their discomfort and promote their ability to learn from the environment.

- Include channels of communication; orientation to new people.

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[120] Moss Kanter, Rosabeth. (1991). Improving the Development, Acceptance, and Use of New Technology: Organizational and Interorganizational Challenges. In People and Technology in the Workplace. National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council: National Academy Press.

Since technology often means that people outside the faculty member's department--broadcasting or media services--will be involved in the delivery of distance education, it would be helpful to know who is who and their function in order to seek the answers to any questions the faculty may have.

- Don't empower "experts"

    Manage technology humanistically--allow for understanding, treat it as a luxury rather than an entity in which blame can be placed.

- Address the issue of fear of technology and reassure that technology is not "out of control."

- Reassure that there will not be replacement.

    Faculty will learn that technology as a delivery system for distance education is a tool and not something that will replace them. Training will also relieve faculty fears of becoming entertainers rather than teachers. Also address the issue that technology will not replace any components of he relationship between professor and student.

Recommendations for Teaching Improvement

- Get faculty ready to learn.

- Methodological discussion.

    This will help faculty determine which methods of instruction are most effective when using technology. This kind of discussion will also aid in the issues of how one adapts current materials to the use of technology.

- Address issues of impersonality resulting from the use of technology and how issues such as socialization and feelings of isolation can be dealt with in regards to the distant learner.

- Discuss how the use of technology impacts issues of pedagogy and curricula.

Recommendations for Faculty Improvement Program Design

- Use a design model that includes audience analysis.

- Use the principles in the design model to design the activities and materials.

- Research what knowledge faculty perceive they need.

- Research and assess needs of the technology--the impact technology has on instruction.

Further Research

This paper attempts to provide a solution to help university faculty who are going to use ,or who are already using, technology as a delivery system for education. The solution represented in this paper is a program to improve faculty performance when using such technology. The problem was approached in this manner because it is a solution that can be implemented even after technology for distance education program is in progress and because faculty performance improvement is commonly approached through the use of faculty development programs. Several questions remain unanswered after the above analysis:

What is the best way to assess faculty needs?

What is the most effective program format?

Are current faculty improvement programs using video tape and in-service workshops proving to be effective?

Are there examples of faculty development that are informally designed, without using a design model? Do these examples prove to be effective?

Are there currently instances in which technology is being used as the delivery system for faculty improvement?

The answers to these questions have merit and are possible topics for further research.

However, the approach to the problems of using technology as a delivery system for distance education presented in this paper is not the sole approach to the problem. There is a great deal of research on planned change. If the circumstance existed where a university was planning to use technology in the future, further research into the processes of planned change would suggest alternative approaches to change. In fact many models of planned change focus on controlling all aspects of implementing change. These models attempt to eliminate many of issues facing university faculty and education addressed in this paper.

Appendix A

Wilbert McKeachie suggests nine guidelines to get people ready to learn. In this case, it is helpful when considering these guidelines to define "students" as university faculty:

1. Treat students [faculty] as learning organisms, humans constantly engaged in seeking, organizing, coding, storing, retrieving, using, and evaluating information. They are not passive receptacles, even when they look that way.
2. Make use of the social milieu. It can be a powerful aid, or source of resistance, to learning.
3. Identify the critical features of the skill or knowledge or attitude to be learned, for those features of the skill or knowledge or attitude to be learned, for those features will set direction and limits to teaching and learning.
4. Stress the importance not just of acquiring knowledge but of strategies for learning, learning how to learn by oneself.
5. Be alert that learning in a classroom from a professor may have different consequences than learning from peers or from experience.
6. Encourage active learning by getting students [faculty] to talk, write, do, interact, teach others.
7. Regard the teacher as a potential model of how to learn and how to relate to learners. Seek to create models who are warm, personal encouragers of learners.
8. Emphasize a flexibility of approach to account for interactions among student characteristics, teacher characteristics, goals, subject matter and method.
9. Attend to situational variables, in particular the creation of settings small enough to attend to individuals and to build social support for learning (p. 43-44).[121]

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[121] Bergquist, William. (1979). The Liberal Arts College. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

Appendix B

Figure 1

Method	Commonly Used For
Workshops, seminars, presentations, or program	• Explore general issues or trends in education • To explore various methods or techniques of instruction. • To help faculty improve their research and scholarship skills.
"Master teachers"	• faculty work closely with new or apprentice teachers.
Faculty with expertise consult with other faculty on teaching or course improvement.	
Personal counseling	• Provides individual faculty members on career goals, and other personal development
Informal assessments by colleagues	• For teaching or course improvement.
System for faculty to assess their own strengths and areas needing improvement	
Visiting Scholars program	• Brings people to the campus for short periods of time.
Annual awards	• Recognition of excellence in teaching
Sabbatical with salary compensation	
Specialists	• to assist individual faculty in instructional or course development by consulting on course objectives and course design. • To help faculty develop teaching skills such as lecturing or leading discussions, or different teaching-learning strategies such as individualized instruction. • Assistance to faculty in use of instructional technology as a teaching aid. • On campus, to assist faculty in the use of audio-visual aids in instruction, including closed-circuit television.
Grants (summer, travel, & general)	• For projects to improve instruction or courses. • For developing new or different approaches to courses or teaching • to refresh or update knowledge in a particular field.
Temporary Teaching load reduction	• to work on a new course, major course revision, or research area.

Extracted from Lindquist, Jack. (1979). Approaches to Collegiate Teaching Improvement. In Lindquist, Jack. (Ed). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

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References

American Heritage Dictionary. (1993). American Hertiage Dictionary. Houghton Mifflin Company.

Beaudoin, M.. (1990). The instructor's changing role in distance education. The American Journal of Distance Education, 4(2).

Bikson, T.K. & Eveland, J.D. (1991). Integrating new Tools into Information Work: Technology Transfer as a Framework for Understanding Success. In People and Technology in the Workplace. National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council: National Academy Press.

Burke, Peter, Heideman, Robert, & Heideman, Carroll. (Eds.). (1990). Programming for Staff Developments. London, England: The Falmer Press.

Bowman, Barbara. (1976). Analysis of a Teacher Inservice Education Model Desgined to Change Teacher Performances and Attitudes. Dissertation for Doctorate at Michigan State University. East Lansing, Michigan.

Clark, Tom. (1993). Attitudes of Higher Education Faculty Toward Distance Education: A National Survey. The American Journal of Distance Education, 7(2).

Cipolla, Carlo M. & Birdsall, Derek. (1979). The Technology of Man. New York: Holt, Rinehart, and Winston.

Collingridge, David. (1980). The Social Control of Technology. London, England: Frances Pinter Ltd.

Day, Chris & Bell, Les. (1991). Managing the Professional Development of Teachers. Buckingham, England: Open University Press.

de Nevers, Noel. (ed.). (1972). Technology and Society. Reading Massachusetts: Addison-Wesley Publishing Company.

Degen, Clara. (Ed.). (1985). Understanding and Using Video. New York, New York: International Association of Business Communicators, Longman.

DeLuca, Stuart M. (1991). Instructional Video. Boston, Massachusetts: Focal Press.

Deutschann, Paul J., Barrow, Lionel C., Jr., & McMillan, Anita. (1961, November-December). The Efficiency of Different Modes of Communication. AV Communication Review, IX.

Edelfelt, Roy A. (1974, Fall). Inservice Education of Teachers: Priority for the Next Decade. Journal of Teacher Education.

Elliot, David & Elliot, Ruth. (1976). The Control of Technology. London, England: Wykeham Publications Ltd.

Evans, Richard I. (1967). Resistance to Innovation in Higher Education. San Francisco. California: Jossey-Bass Inc.

Fisher, Shirley & Cooper, Cary L. (eds). (1990). On the Move: The Psychology of Change and Transition. New York, New York,: John Wiley and Sons.

Foster, Thomas U. (1970). Testing Visual Information Presented via Television to Two Methods. Thesis for Master of Arts, Michigan State University, Michigan.

Gooler, Dennis. (Ed). (1989, March). Preparing Teachers to Use Technologies: Can Unversities Meet the Challenge? Educational Technology.

Hakes, Sachs, Box, & Cochenour. (1993). Compressed Video. The Association for Educational Communications and Technology. Assocation for Educational Communcations and Technology.

Hall, James W. (1993, Spring). Educational Technology in the University: Moving from Stage One to Stage Two. Education, vol. 113 (3).

Harris, Ben M. & Bessent, Wailand. In Colloboration with McIntyre, Kenneth E. (1969). Inservice Educaiton A Guide to better Practice. Englewood Cliffs: Prentice Hall, Inc.

Heywood, John (1989). Learning Adaptability and Change: the Challenge for Education and Industry. London, England: Paul Chapman Publishing Ltd.

James, Samuel D.K. (1985). The Impact of Cybernation Technology on Black Automotive Workers in the U.S.. Ann Arbor, Michigan: UMI Research Press.

Laumann, Edward O., Nadler, Gerald, & O'Farrell, Brigid. (1991). Designing for Technological Change: People in the Process. In National Academy of Engineering, Commission on Behavioral and Social Science and Education, National Research Council. People and Technology in the Workplace. National Academy Press.

Laurillard, Diana. (1993). Rethinking University Teaching: A framework for the effective use of educational technology. New York, New York: Routledge.

Lindquist, Jack. (Ed). (1979). Designing Teaching Improvement Programs. Battle Creek, Michigan: The Council for the Advancement of Small Colleges.

Lindquist, Jack. (1978). Strategies for Change. Berkeley, CA: Pacific Soundings Press.

Lippitt, Gordon L. (1973). Visualizing Change: Model Building and the Change Process. Virginia: NTL Learning Resources.

McCarthy, Tom. (1991). Right way/wrong way" presentations--The use of Common Errors in instructional videos for procedure learning. Masters of Arts Thesis, Michigan State University, Michigan.

McNeil, D.R. (1988). Status of Technology in Higher Education: A Reassessment. Paper presented at Second Annual Conference on Interactive Technology and Communications. Augusta, Maine: University of Maine.

Moore, Charles E. & McLaughlin, John M. (1992, December). Interactive Two-Way Television: Extending the Classroom Through Technology. T.H.E. Journal, Vol. 19, Num. 7.

O'Brien, David M. & Marchand, Donald A. (1982). The Politics of Technology Assessment. Washington, D.C.: Heath and Company.

Patel, I.J. & Buch, M.B. (Eds.). (1968). Readings in In-Service Education. India: Anand Press.

Pink, William T. & Hyde, Arthur A. (Eds). (1992). Effective Staff Development for School Change. Norwood, New Jersey: Ablex Publishing Corporation.

Predko, J., Spurgin, M. Galindo, J., & Gizinski, S. (1994). Collaborative Implementation of New Technologies: Lessons Learned from Administrators, Faculty, and Students. National Issues in Higher Education. Kansas: Kansas State University.

Rubin, Louis J. (Ed). (1971). Improving In-Service Education: Proposals and Procedures for Change. Boston, Massachusetts: Allyn & Bacon, Inc.

Smith, David L. (1991). Video Communication: Structuring Content for Maximum Program Effectiveness. Belmont, California: Wadsworth Publishing Company.

Thompson, William B. (Ed.). (1991). Controlling Technology: Contemporary Issues. Buffalo, New York: Prometheus Books.

Van Berkum, Dennis, Euller, Judith A., Flack, Jan A., Johnson, Jean M., & Schepp, Julie. (1993, Spring). Teacher Training Workshop Manual: North Dakota Interactive Video Network. North Dakota: University of North Dakota.

Williams, D.C., Paul , J., & Ogilivie, J.C. (1957). Mass Media, Learning, and Retention. Canadian Journal of Psychology, volume 11.

Young, Donald A. (1973, January). The Trouble with Training Today. In Training in Business, Industry and Government. Engle Cliffs, New Jersey: Educational Technology Publications.