The Role of Context in Instructional Design: A Case Study Examining the Re-Purposing of Web-based Master's Degree Courses for use in Malawi

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(Abstract)

This case study examined how contextual factors influenced the adaptation of on-line courses created in the United States as they were re-purposed for use in Malawi.

The investigation starts and ends within Year Two of a five year project funded by the United States Agency for International Development (USAID). The grant brings together an instructional technology program at a large research university in the southeastern United States and a newly established national university in Malawi, Africa.

A total of 24 people participated in the study. Of these, nine were directly involved in the adaptation process, five of whom were students from Malawi. Six other Malawian students took part in a formative review of the instructional products. Three professors of instructional technology were also directly involved in the adaptation process.

The participants involved in the adaptation process did their work over the course of one semester. They took pre-existing web-based courses created for an on-line master's degree program in instructional technology and adapted them for use in Malawi by accounting for various contextual elements.

Data included project documents, student-created materials including personal journal reflections, interviews with students and faculty at both institutions, field notes, and personal observations by the researcher. Data analysis procedures followed protocols established for descriptive, qualitative methodologies.

The findings emphasize the importance of a needs assessment and context analysis as developed by people who are native to a particular culture. Instructional designers who are made aware of contextual factors through such documents become more sensitive to cultural issues related to teaching and learning. Negotiation among team members to come to a workable consensus is also important, as project goals inevitably evolve. Another interesting outcome of this study was the fact that not one context, but two, affect adaptation. Whereas the Malawian context impacted content and delivery mechanisms of the courses, the U.S. context influenced the process and procedure for design.

DEDICATION

This work is dedicated to the memory of

Philip Dean Perkins

ACKNOWLEDGEMENTS

I want to approach the matter of acknowledgements with the same depth and sincerity displayed by Shakespeare's Cordelia in *King Lear*. She said the least but she meant the most. So, to my family and friends who provided love, support, guidance, humor, and encouragement, you have my deepest gratitude. Now it is mine to prove in actions, not words, how much you mean to me.

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CHAPTER ONE

Introduction

Janet badly wanted a card catalogue, but not in the same way Mr. Baker yearns for the drawers with thousands of crème-colored cards that once represented the holdings in the larger structure of the library (Baker, 1994). Being her first semester in the U.S., she was not yet fully aware of the technological makeover in most libraries that caused Baker, a novelist born in the U.S., to write scathingly of all who would dare remove the index-card laden boxes from the library floors. Since Janet had designed an entire lesson around the card catalogue for students at her university in her home country of Malawi, she needed access to one so she could do a formative evaluation of her instructional design project.

Janet came into my office and in a tone of exasperation and disbelief lamented that the main campus library had no card catalogue. The very idea that it did not have one seemed to stun her. I knew of two other places on campus that might possibly have one, but I called the town library just to check. They did not have one either and said that a library in a small town about 20 miles west may possibly have one. The logistics of gaining access to that catalog were not easy, so on the cold, November day we marched across campus to find a card catalogue. As we entered the Art Library, all we saw were computer terminals and shelves of books and magazines. We walked to the around a bit, thinking perhaps the catalogues may have been banished to a back corner. Finally, we asked at the front desk if they might have one. I got an expression from one woman who looked at me as if I had asked her to find a phonograph player or a Model-T automobile. She was friendly and helpful, though, even making some phone calls around campus. Ten minutes later, we heard what I expected to hear – no card catalogues. Even the ones in storage had been moved somewhere else. Janet was a bit put off, but I knew with certainty that the Physics Department on campus had its own small library with its own set of familiar, wooden card boxes. We walked to the third floor of the building and found what we were looking for – almost. Janet and I glanced through the boxes and wrote out call numbers. We went to the shelves and much to our dismay, we found that no one had maintained the stacks properly – the books were jumbled together on the shelves. Thus, disappointed, we left. She thanked me for my help and said she would try other options.

Janet eventually found another library card catalogue off-campus (she did not tell me where) and completed her formative evaluation assignment. But the lesson I learned during the hunt for what is now surely an antique in most libraries in the United States became locked in my thoughts when I discovered its relevance to this case study.

Purpose of the Study

Based on a literature review and my own speculation, my concern had been that the lessons created for a U.S.-based distance education program could not be carried out in Malawi without being adapted to the local context. What had happened to Janet as she searched, seemingly in vain for the all-but-obsolete boxes, made my concerns all the more realistic. Janet did not have a bad lesson – all parts of the design had been approved by the course instructor and she had gotten positive feedback. Her lesson fit her own context very well: meeting the needs of learners, taking into account available tools, and so on. But despite the quality of the lesson, it was unusable anywhere on the campus. To become useful, how would it have to change? What would she have to account for? What factors would ultimately influence the changes? These are the questions I examine in this case study as they relate to the re-purposing of web-based courses created in the U.S. for use in Malawi.

Overview of the Study

This case study took place during a five month period marking the end of the second year of a five-year grant funded by the United States Agency for International Development (USAID). The grant brings together two universities, one in Malawi, Africa and the other in the southeastern United States. One of the main objectives was to build human capacity in Malawi, a country listed by the United Nations as a "least developed nation" (for more about LDC's, see Chapter Two). The LDC designation results in large part from the sub-Saharan nation's poor economy, lack of infrastructure, and very sparse human resources. The role of the U.S. university was to educate selected staff members from a university in Malawi and to award them master's degrees in instructional technology at the end of their studies. The degree ceremony for four of five participants took place in May 2003.

Over the course of a semester, the Malawian students, along with other participants in an on-campus instructional technology (IT) course titled "IT Clinic" redesigned three on-line, master's-level courses so they would better fit the context of Malawi. The courses chosen for adaptation have been a part of the curriculum in a web-based master's degree program in IT offered at the U.S. institution.

The plan to use on-line courses as part of a new distance education program at Mzuzu University had been part of the original USAID proposal. However, the plan was modified somewhat after a national needs assessment, conducted in Summer 2002 by the Malawian master's degree students. Using a qualitative, descriptive case study approach (Merriam, 1988, 1998; Stake, 1988, 1994, 1995), the research presented in this report describes the re-design effort, with a specific focus on contextual factors leading to changes in the on-line courses.

Rationale for the Study

As discussed in a subsequent section of this document, distance education initiatives have been used to meet the various challenges present in educational systems around the world, but their impact is all the greater in developing nations. In such regions, distance education programs often serve as the only means for people to achieve a formal education, due to the "paucity of technical talent, lack of funds, or extraordinary distances and isolation in areas of a country" (Moses, Edgerton, Shaw, & Grubb, 1991, p. 59).

Hawkridge (2002) laments that one of the most serious problems facing distance education program development in many countries is the lack of trained instructional technologists. He notes, too, that even in developed countries where one can find instructional technology programs, those who design distance instruction often do so with market strategies, not instructional strategies, in mind. One result of this has been the increasingly heavy reliance on the Internet to distribute materials. The problem of using those materials in other countries comes from the fact that they are not designed for cross-cultural use and they are distributed by a means that is not widely available in developing countries (Butcher, 1998; D. Eastmond, 2000).

While some distance education programs in other nations are successful and sustainable, others whither after a few years due to a combination of factors (unstable political climate, lack of funding, infrastructure breakdown, etc.). For those involved in the adoption and implementation of innovative distance education solutions, factors related to the program's success or failure are of critical importance (Rogers, 1995). Organizations obviously cannot control all negative influences, but they can at the very least require the products they build or import to properly fit local needs. Examining how an existing distance education program developed in one cultural environment is tailored to fit local needs of a different culture is the major goal of this research initiative.

The focus of the research is framed by three theoretical constructs: the theory of perceived attributes (Rogers, 1995); context in instructional design (Tessmer & Richey, 1997), and the co-production of distance learning materials (e.g., Moran & Mugridge, 1993). Aside from the theoretical framework that justifies the case study, practical reasons also exists. First, the documentation of the activities undertaken by the project team will factor into summative evaluation reports that must be produced on a semi-regular basis. Second, the findings of this study can serve as a guide to future redesign efforts. A case study that examines the efforts to re-purpose an existing instructional technology master's degree program for the Malawian context is justified at both theoretical and practical levels.

Research Questions

The goal of the research being proposed is to describe and interpret the efforts of a U.S.-Malawian instructional design team as it repurposes existing distance learning master's degree courses. As such, there is one central question to be answered by this study:

> Which practical and theoretical considerations influence a team of designers as it adapts distance education courses for the Malawian context?

Five related sub-questions are also posed to assist in providing a detailed description of the case:

a) What does the redesign process imply about planning for implementation?

b) How does the context analysis (needs analysis) affect the instructional redesign of the original on-line courses?

c) How do the original project goals change?

d) Which delivery, assessment, and management strategies develop for the redesigned courses?

e) In what ways do inter-institutional issues factor into the adaptation process?

Limitations

The unique nature of the events of this case study meant that the research had to begin without the benefit of a pilot test. Issues and problems encountered over the course of the semester in regard to design techniques, team collaboration, or logistical considerations could not be predicted and had to be dealt with as they arose. Another limitation to this study is that it does not follow the results of the re-design efforts to the next logical step, the implementation phase. Such information would prove beneficial for interpreting the full impact of design decisions, but the ramifications of the redesigned courses must be left for a later report.

Summary

Upon agreeing to enter into a partnership arising out of the USAID grant, the faculty members at both the U.S. and Malawian institutions undertook a difficult task. Even though the instructional technology master's degree program had already been created and works well for the U.S. institution, all involved in the project knew that it had to be changed to more closely align with the Malawian context. How those changes would occur and what the changes would look like was speculative.

The rationale for the study has its source in both theoretical and practical frameworks. Relevant literature in the areas of diffusion of innovations (Rogers, 1995), context in instructional design (Tessmer & Richey, 1997), and co-production of learning materials (e.g., Moran & Mugridge, 1993) provide the theoretical basis for the study. The practical considerations stem from the need to document and analyze the activities of the project so as to

inform distance education practice for similar international endeavors. Additionally, the documentation of the project results will be used for both formative and summative evaluations of the USAID project.

The major research goal set for this study examines the transformation process of courses. The courses, all of which were created for a specific North American audience, were adapted for use in a sub-Saharan African nation. The study itself will result in a descriptive, qualitative case study that provides ample documentation of the process based on various data sources. Implications resulting from the research will help enlighten discussions about the impact of context in instructional design, implications for the use of existing U.S. or “first world” distance education programs in a developing nation, and experiences related to collaborative agreements between international institutions of higher learning.

CHAPTER TWO

Definitions

A discussion of key terms used throughout this document are presented in this chapter so that potential ambiguities do not obscure the readers' understanding of the issues raised in the study. The terms defined include: *educational technology; innovations and technology; distance education, developing nations,* and *culture.* The definitions presented here are not necessarily universal. The same terms would likely be used differently depending on context; each is flexible enough to allow for variations on use without losing its essential meaning.

Educational Technology

The most common point of agreement among researchers on the definition of *educational technology* is that there is no one accepted definition for it (Chadwick, 1970; Davies, 1996; Ely & Plomp, 1996; Gentry, 1991; Knirk & Gustafson, 1986; Reiser, 1987; Seels & Richey, 1994; Thomas, 1987). Put quite plainly, educational technology means different things to different people (Saettler, 1968; Thomas, 1987). Additionally, the term educational technology itself is either differentiated from (Cox, 1971; Ely & Plomp, 1996; Gentry, 1991; Knirk & Gustafson, 1986) or interchanged with the term *instructional technology* (Schneberger & Jost, 1994), thus further diversifying perspectives.

In the interest of brevity, an extended debate the nuances of *educational* and *instructional technology* will not consume much space. However, it is important to understand what, exactly, is meant by the term *educational technology* when it is used. There are arguments by some that instructional technology is subordinate to educational technology (Chadwick, 1970; Cox, 1971; Ely & Plomp, 1996; Knirk & Gustafson, 1986), but the two terms will be interchanged freely, at least for the purpose of exploring the question at hand.

Furthermore, rather than use a complex definition for *educational technology* (such as the 16 part definition found in Ely & Plomp, 1996), it is sufficient to recognize that educational technology has two major components, as Reiser (1987) points out:

> Today, many professionals in the field think of instructional technology as a systems approach process, 'a systematic way of designing, carrying out, and evaluating the total process of learning and teaching.' However, it is important to realize that most of those outside the field, as well as some of those who consider themselves to be a part of it, still think of instructional technology as audiovisual devices. Thus, the two types of definitions still persist; instructional technology is thought of both in terms of the systems approach and audiovisual devices. (p.12)

Although generally more attention is given to research on the impact of educational technology devices (such as instructional television, computer-based learning, etc.) than to systems approaches, it is important to remember that the "technology" part of the definition does not refer solely to "tools." Reiser's (1987) description also includes a systems approach, as the definition of technology itself is one that entails the application of a method (or a material) to solve a problem.

Given the various aspects of education and technology for which one must account, and in the interest of being succinct, the definition to be used for educational technology for the purpose of this section is provided by Gentry (1991), who states educational technology is "the combination of instructional, learning, developmental, managerial, and other technologies as applied to the solution of educational problems" (p. 8).

Innovation and Technology

Is any innovation a technology? If so, is the reverse also true? The response to this question varies depending on one's assumptions about an innovation itself. An answer must be found by looking at existing definitions.

Technology is defined as "the practical application of knowledge especially in a particular area," "a manner of accomplishing a task especially using technical processes, methods, or knowledge," or "the specialized aspects of a particular field of endeavor" (*Merriam-Webster's Collegiate Dictionary*, 2001). This affirms the notion that there is no reason to limit the concept of "technology" to "machine" (Chadwick, 1970).

Innovation is defined as "a new idea, method, or device" (*Merriam-Webster's Collegiate Dictionary*, 2001), but Rogers (1995) expands the definition, stating that an innovation is "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (p. 11). He notes that the actual chronological novelty of the innovation does not matter – it is the perception of novelty that matters most.

The parallel between technology and innovation is that both concern an aspect of methods or knowledge. The terms diverge in their temporal nature according to the denotative definition, but in Rogers' definition, the time element (newness) is relative to the adopter – it is not measured from an invention date. Given the first definition, the idea of novelty describes innovation but not necessarily technology. However, given Rogers' understanding of the *perception* of innovation, all technologies were not only innovative at one point in their history, but could be considered innovative even in the 21st century.

Distance Education

Although the term *distance education* is somewhat difficult to define (Keegan, 1996; Rossman, 1992; Simonson, Smaldino, Albright, & Zvacek, 2000; The Commonwealth of Learning, 2000), Keegan (1996) points out, "definitions of distance education may be phrased differently but there is general agreement on the field of study being defined" (p. 3). Examples of different phrasing include simple descriptions, where distance education is curtly defined as "structured learning in which the student and instructor are separated by time and place" (McIsaac & Gunawardena, 1996, p. 403), to the more complex, such as Keegan's (1996) five-part definition. All authors, however, emphasize the idea that there is separation of time and/or space of the learner and the instructor and that instruction is delivered via some technology, be it voice, video, print, or data (Hall, 1996; M.G. Moore, 1994; Perraton, 1992; Willis, 1993).

A number of phrases other than distance learning describe essentially the same phenomenon: distance learning, distance teaching, tele-work, tele-learning, tele-teaching, outreach education, correspondence education, home study, external studies, independent study, open learning or open education, virtual schools, satellite schools, and flexible education (D. Eastmond, 2000; Keegan, 1996; Willis, 1993). Each has its own nuances that make it more or less suitable depending on the context in which it is used. For example, "tele-learning" seems to suggest that learning is happening telephonically, which is hardly a reality in parts of the developing world where there may be four phone lines per 1,000 people. Also, as Perraton (2000) notes, terms like "open" or "flexible" learning are sometimes seen more as an educational philosophy than an actual educational mode.

In order to account for the many types of distance education found globally, the definition of distance education to which this paper shall adhere needs some specificity, yet not so much so that other cultures' conceptions of distance education are ignored. Perraton's (2000) definition seems to best suit this purpose: "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the

learner" (p. 13). The definition, while not perfectly suited for every situation, addresses the main components of distance education: the teacher, the learner, the mode, the place, and the time.

Developing Nations

Those writing about the status of nations take caution to clarify their use of the word *developing* (or any variation of it). For example, Schramm (1964) notes that his use of the terms *developing* or *underdeveloped* is done strictly in the economic sense and states that the terms are not pejorative. The distinction between a developed and underdeveloped nation, he remarks, is that the former has had some form of an industrial revolution, while the latter has not had one or are preparing for it. Similarly, Thomas (1987) points out that the term developing nation "[is] not intended to suggest that societies which we label developing are inferior to more industrialized nations in social organization, in moral virtue, in humanitarianism, in cultural sophistication, in artistic endeavor, in public safety, or the like" (p. 4). The bifurcation of nations into two categories, Thomas admits, "distorts reality," but it allows him "compare the conditions and problems of nations that are typically modern technology's creators with those which are usually the recipients of innovations" (p. 4). One does not learn much about a political system with the term *developing*, as Kamrava (1995) makes clear, but it is at least historically regarded as neutral and objective term. Besides the political differences, the various social and economic factors have been found to be heterogeneous across different developing cultures (Goldstone, 1977), but the tenuous nature of their infrastructures and systems are a commonality, which allows for a basic categorization.

Generally defined, developing nations are "the economically underdeveloped countries of Asia, Africa, Oceania, and Latin America, considered as an entity with common characteristics, such as poverty, high birthrates, and economic dependence on the advanced countries" (Chaliand, n.d., para. 1). The United Nations Conference on Trade and Development (UNCTAD, 2001) has three criteria for what it calls *least developed countries* (LDC). The UN lists a total of 49 countries that fall into the LDC category. They share the following traits: low per capita gross domestic product (GDP); weak human resources, which are measured by a composite index "based on indicators of life expectancy at birth, per capita calorie intake, combined primary and secondary school enrollment, and adult literacy;" and low levels of economic diversification, which is an aggregate measurement of various economic factors related to labor, manufacturing, energy consumption, and merchandise exports. A nation or state must meet at least two of the three criteria to be considered a least developed country. Currently, the per capita GDP (individual income) threshold is between US$800 and US$900 (UNCTAD, 2001). As a comparison, the per capita GDP in the United States is currently US$28,000; in Malawi, it is US$210.

Two other terms important to understand are frequently associated with a developing nations: *third world* and *the South*. The two descriptors are frequently used, but are even less accurate portrayals of the countries in need of greater resources. The phrase third world was originally any country not controlled either by the capitalist West or the communist East (Chaliand, n.d.; Johnson, 1991). The term now is anachronistic given the events of the 1990s and the collapse of Eastern block powers (Kamrava, 1995; Perraton, 2000). The term South, like the term third world, has come into vogue in literature about developing nations (Johnson, 1991) but it is not an entirely helpful descriptor either. Of the nineteen of the states originally listed as the South, eleven are actually north of the equator. Industrialized nations of western Europe, North America and Asia, including Australia which is well below the equator, are considered North (Johnson, 1991). Some countries discussed do not meet UNCTAD's criteria for least developed countries, but may have lacked or are lacking the same educational or technological resources as found in Northern and Western Europe, the Middle East, and North America. D. Eastmond (2000) uses the term low technology countries to identify such nations.

However, depending on one's definition of technology, this term also lacks descriptive power. This document will therefore use the term developing (or a variant thereof) as it seems to encompass both economic or technological development comparisons and is likely the most pragmatic means of categorization.

Culture

Defining the concept of "culture" is no easier a task than the task of defining other terms discussed in the chapter. Jenks's (1993) self-effacing words are enough to keep this exploration of what culture means from becoming too laborious:

> The idea of culture embraces a range of topics, processes, differences and even paradoxes such that only a confident and wise person would begin to pontificate about it and perhaps only a fool would attempt to write a book about it – thus I begin. (p. 1)

Lonner and Adamapoulos (1997) refer to the "range" to which Jenks refers, noting "there are 200 or more definitions of 'culture' in the literature of the social sciences, not one of which has been embraced by a substantial number of social scientists" (p. 76). Kroeber and Kluckhohn (cited in Geertz, 1973) provide numerous definitions for culture, ranging from "a total way of life of a people," to "a way of thinking, feeling, and believing," to "learned behavior," to "a set of techniques for adjusting both to the external environment and other men" (pp. 4-5). Strauss and Quinn (1997) provide an overview of four schools of thought:

> Geertzian interpretivists have stressed the *publicness* of meaning, cognition, and culture. Foucauldian postmodernists have argued for the *constructedness* of culture and of the self. Some contemporary historical materialists highlight the importance of *resistance* to cultural meanings. Finally, many of our colleagues in cognitive and linguistic anthropology focus on the way thought and meaning are *situated*. (p. 12)

The number of definitions available and the diverging schools of thought means that there is little hope for consensus on the issue (especially here). Perhaps Kroeber and Kluckhohn's definition (cited in Berry, Poortinga, Segall, & Dasen, 1992) can provide a point of departure:

> Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive elements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; cultural systems may on one hand be considered as products of action, on the other as conditioning elements of further action. (p. 166)

Regardless of the definition, though, it should be understood that culture is assumed to be an antecedent to thought and behavior (Berry et al., 1992; Keller & Greenfield, 2000; Lonner & Adamapoulos, 1997). Just how culture explains or influences human thought and behavior, however, has yet to be determined (P.B. Smith, Harb, Lonner, & Van de Vijver, 2001).

Summary

Based on the preceding discussion, e*ducational* and *instructional technology* will be used synonymously. The definition of educational technology to be used comes from Gentry (1991), which states: "educational technology is the combination of instructional, learning, developmental, managerial, and other technologies as applied to the solution of educational problems" (p. 8). Distance education is defined as "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner" (Perraton, 2000, p. 13). Nations currently at economic or technological disadvantage when compared to industrialized countries will be described as *developing* or *underdeveloped*. The terms *innovation* and *technology* will also be used interchangeably; an

educational (or instructional) technology is the same as an educational (or instructional) innovation. The concept *culture* is summarized by emphasizing the communication of patterns by symbols through distinctive human groups – it is both a product and process of action. It might be said, therefore, that culture creates context and at the same time is created by it.

CHAPTER THREE

Literature Review

Not surprisingly, a study about context needs to be placed in a context in order to be properly understood. A literature review in the qualitative case study does not necessarily lead one to find gaps in previous research or suggest ways to extend existing theory (Merriam, 1988), but acts as a way to help both the researcher and the reader understand the wider scope, the big picture in other words, of the specific case under examination. For that reason, the literature review for this study takes into account a number of different areas that serve both as background information and provide a framework for theoretical interpretation.

Starting with a review of Rogers' (1995) work in diffusion of innovations as it is related to instructional technology, especially developing nations, the review then examines applications of distance education in Africa. A brief section on the co-production of learning materials highlights the difficulties that arise as partnering institutions from different nations try to create instruction. Unfortunately, the problems are numerous and the results are often less than adequate. The first three sections of the document provide multiple examples that speak to the importance of context in the innovation process. The "contextual imperative" section is then followed by a fairly comprehensive treatment of the context surrounding of this particular case study, the Malawian educational system. The evidence that the system needs assistance is abundantly clear. The subsequent section provides a more specific instance of contextual concerns as related to instructional design. Context as it affects the design process lies at the heart of the case.

Diffusion of Innovations

Everett M. Rogers' (1995) work related to the diffusion of innovations has been the foundation of research in the field for the past three decades (Burkman, 1987; Carr Jr., 1999; Ellsworth, 2000a; Surry & Farquhar, 1997). Thousands of studies have examined diffusion processes in numerous disciplines (Engel, Blackwell & Minniard cited in Zakaria, 2001), and studies of diffusion in education are "important in terms of the number of studies completed" (Rogers, 1995, p. 63). A number of authors recognize the importance of applying ideas about diffusion to educational technology (Burkman, 1987; Ellsworth, 2000a; Ely, 1990; Surry & Farquhar, 1997).

The definition of diffusion includes elements of a general communication model, and Rogers states that diffusion is just that – a specialized instance of communication. The specialized nature is found in the fact that the communication is about a new idea, object, or process (1995, p. 5). A number of communication theories exist (see Wisely, 1994), and Rogers' concept of diffusion accounts for the elements found in many of them. The elements of a general communication model include the sender (the innovator), the receiver (the potential adopter), the channel (planned or unplanned information about the innovation and resulting feedback), and interference (uncertainty), which results from perception. An illustration of an innovation communication model is shown in Figure 1.

The goal of educational innovation is to "improve or change certain aspects of the educational process" (Malan & Rassekh, 1983, p. 5). Diffusion is "a kind of social change, defined as the process by which alteration occurs in the structure and function of a social system" (Rogers, 1995, p. 6). Important to remember, also, is that innovation and change are not the same:

> Innovation is not synonymous with change. Change is merely a shift from one practice to another. By contrast, innovation is purposeful change, directed change, which self-consciously attempts to improve, reform, make new. Innovation is an attempt to improve quality and service: the quality of a product must be better than before… (Hall, 1991, p. 7)

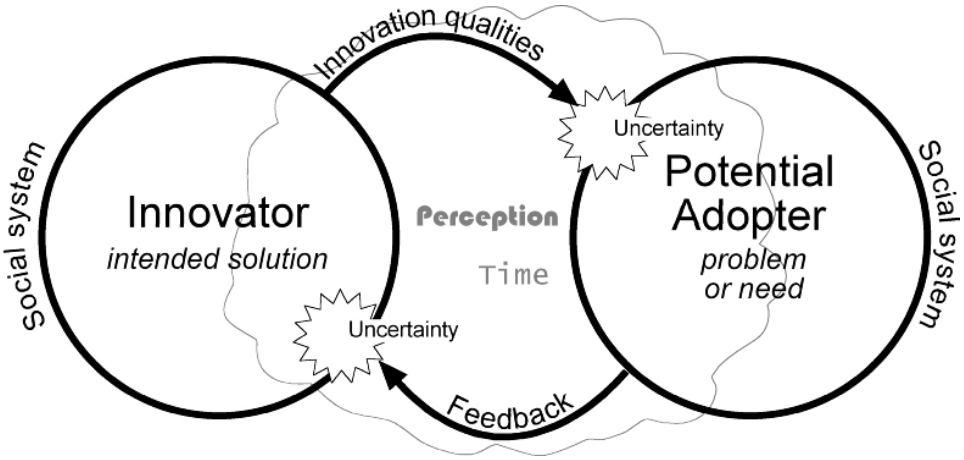

Figure 1. An innovation communication model (diffusion)

That educational technology is not being applied as it should frustrates a number of instructional technology professionals (ITPs) (Burkman, 1987; Schneberger & Jost, 1994; Surry & Brennan, 1998). How will these problems or barriers be resolved? Diffusion should be important to instructional technologists for at least three reasons, as Surry and Farquhar (1997) point out:

1. A better understanding of the numerous factors that affect the diffusion of innovations may help experts in educational technology account for variables that either block or aid the adoption of their work.
2. Instructional technology itself is an innovative discipline, and those working in instructional technology who better understand diffusion theory will be ready to work more efficiently with potential adopters.
3. Since instructional technology already uses a systematic process to guide design, it is possible that a systematic model of diffusion of innovations could guide them in much the same way. (Diffusion Theory, para. 4-6)

Schneberger and Jost (1994) speculate that educational technology is not be applied to the degree that has been expected for at least three reasons: teacher resistance, bureaucratic inertia, and lack of funding. While there are many other barriers to adoption such as social pressures, inadequate information about an innovation, inherent complexity, ignorance of political inertia, poor timing, and so on (Hall, 1991), problems of adoption are not unique to educational or educational technology – they extend to any proponent of new technology (Schneberger & Jost, 1994).

The discussion that follows integrates examples of research in educational technologies in developing nations by combining elements from Rogers' (1995) diffusion theories: innovation decision process theory; theory of perceived attributes; rate of adoption theory; and individual innovativeness theory. A range of studies have been selected to show the diversity of applications of educational technology. The emphasis tends to be on the "tools" aspect of technology (what Rogers would call "hardware") as opposed to the systems or design aspect ("software") often associated with instructional technology. Tracking the former is more easily

done; “the diffusion of such software innovations [ideas, philosophies, or methods] has been investigated, although a methodological problem in such studies is that their adoption cannot be so easily traced or observed in a physical sense” (Rogers, 1995, p. 13).

Diffusion, Educational Technology and Developing Nations

Formal attempts to integrate educational technologies into teaching and learning in the developing world have been made since the 1960s (e.g., Dordick, 1968; Lefranc, 1967; Schramm, Coombs, Kahnert, & Lyle, 1967). It was during the same time that a number of predictions were made that directly linked economic development to the education of citizens (Carnoy & Samoff, 1990; DeYoung & McKenzie, 1989; Fägerlind & Saha, 1989; Michele, 1987). If education was needed to develop national economies, educational technology could help do it faster, or so it was thought. The prevailing sentiment was that educational technology could solve a host of problems faced by education systems in countries that did not have the resources to educate large numbers of people (Chadwick, 1970; Coombs, 1968). Interestingly, both Cox (1971) and Marchessou (2000) say nearly the same thing about the effects of educational technology’s effects three decades apart:

1. The “extensions” and newer electronic media have become critically pertinent to basic educational problems faced by all developing nations, but newer media considered as panaceas to educational problems have often created as many problems as they have solved. (Cox, 1971, p. 66)
2. We have in the past 35 years seen many enthusiastic expectations about the forthcoming miracles come to grief whenever the successive waves of technological media failed to deliver any dramatic improvements to the never-ending educational crises that affect the First, Second, and Third worlds. (Marchessou, 2000, p. 114)

Why is it that two authors, one writing 30 years before the other, would note the same failures? Is 30 years too short a time for technologies to diffuse in such a way as to be at least nominally effective in each context to which they are applied? Determining all the reasons for adoption or failure to adopt with any degree of specificity would be quite difficult – as noted earlier, many factors go into such decisions. Instead, one must simply look at the reports on implementation in varying contexts and then try to align it with diffusion processes.

Relative Advantage and Compatibility

A central tenant of innovation theory is not the inherent qualities of an object or idea, but how those qualities are perceived. Rogers’ (1995) theory of perceived attributes takes into account the notion of *relative advantage*, which he defines as “the degree to which an innovation is perceived as being better than the idea that it supercedes” (p. 212). Relative advantage can be measured in economic terms, social prestige, convenience, satisfaction.

Two studies from Nigeria, one conducted with university faculty members (Ajibero, 1985) and the other with primary school teachers (Akinyemi, 1986), provide an example of perceptions toward educational technology. The results of the Aijbero (1985) survey of faculty members at Nigerian universities (N=193) showed a strong positive attitude toward media technologies. More than 90 percent of the respondents believed that media technologies could be very effective in large classes (more than 80 students). Aijbero speculates that the positive response may be due to the fact that respondents “value the technological innovation in higher education, and that they are prepared to accept … educational change” taking place elsewhere (p. 40). Additionally, the faculty members indicated an awareness of the problems faced by Nigerian universities (increased enrollments, demand for courses, etc.) could only be solved by use of media technologies.

Akinyemi (1986) surveyed primary school teachers in Nigeria (N=48). One result of the study indicated that more than 75 percent of the respondents stated that they would avoid use of educational technology in their classroom because they would not want to be embarrassed by not knowing how to use it. Only a very few of the respondents could correctly identify technology tools commonly found in classrooms of developed countries (overhead transparencies, video cassettes, records, etc.). But their lack of knowledge of these items, Akinyemi writes, may well have stemmed from their inability to use any electronic equipment: schools simply do not have electricity. Eighty-percent of the respondents did not consider themselves "technologically minded" (p. 267). Certainly, such results cannot be generalized to other Nigerian primary school teachers, let along teachers in Africa. The study does give some valuable insight, though, to the orientation of one of the end-users of educational technology.

Is it possible to expect that educational technologies would be adopted at either Nigerian school? It is quite likely that even with the proper infrastructure that the primary school teachers would not be willing to adopt the innovations; "technological involvement, in general, is a function of the amount of technology that is available. Technology in the classroom is not part of the culture in many African schools" (Akinyemi, 1986, p. 264). To the faculty members, the relative advantage and issues of compatibility are clear. To the primary teachers, there is a measurable lack of knowledge, but as Akinyemi acknowledges, that may be the result of their recognition of the incompatibility of the innovations. Rogers (1995) writes that a number of studies on perceived attributes "universally report a positive relationship between relative advantage and rate of adoption" (p. 216). Compatibility is also positively related to adoption, although seemingly less so than relative advantage (Rogers, 1995). Where potential adopters can perceive an advantage and if the innovation is compatible with their circumstance, they will likely adopt it. Where they can not see an advantage, they do not believe an innovation is compatible.

Another example of compatibility is found in the case of El Salvador (discussed in Cox, 1971; Schramm, 1977). Trying to fulfill a need for better trained teachers, El Salvador sought a means to distribute training in as efficient manner as possible. First discussions of instructional television [ITV] began in 1960 and gradually, after funding had been secured and a human infrastructure had been created to support the effort, ITV started in El Salvador in 1969. What made ITV a particularly appealing solution, according to Cox (1971), was a geographic feature of the country – El Salvador is relatively small and is a mountainous area. Therefore, with one large television transmitter and some small re-transmitters, a television signal would be able to reach the entire country. In this case, the desires of the education planners to have ITV, the perceived economic advantage, and the physical compatibility led to the adoption and wide spread use of ITV in El Salvador.

Trialability

A trial period for an innovation helps potential adopters answer their own questions about how an innovation might work in their individual situation. Generally, new ideas that can be tested for a limited time are "generally adopted more rapidly than innovations that are not divisible" (Rogers, 1995, p. 243). Because the money for a project is set and projects are determined, schools or educational systems do not have an opportunity to put the innovation through a trial period. Donations by outside sources is what allows nearly any innovation in educational technology to be implemented in a developing nation, which invariably plays the role of "importer" (Hawkridge, 1991; Michele, 1987; Modest, 1997; Schramm, 1977; Thomas, 1987; Wells, 1976). Of the five projects Schramm (1977) reviews, "none…came into being without substantial assistance from outside." Upwards of US$30 million (in 1960s dollars) were spent fund the projects in Nigeria, American Samoa, El Salvador, and Ivory Coast. Quite literally, the innovation becomes an "all or nothing" proposition. Sometimes, however, this is as

much of a cultural value as it is economic. Commenting on the use of ITV in American Samoa during the 1960s, Schramm (1977) describes a culture that would not tolerate pilot tests that would benefit one group of students to the exclusion of others; "…the chief reason may have been the reluctance of the Samoans themselves to introduce the new system one grade at a time. A Samoan cultural norm, or so it was reported at the time, provided that 'all should go forward together'" (p. 153).

The aspect of perception must be re-emphasized. Sometimes a trial period can not take place due to time or funding constraints. At other times, however, the perception exists that a technology will work simply because it is *technology*. As Ely (1990) notes,

> Another reason for acceptance and implementation has been the *perception of modernization* [emphasis his] on the part of educational and government leaders. Using the Western-model of problem-solving through technology, many countries purchased communication hardware that symbolized progress. It could be seen and touched. It was the same equipment that was being used in the more developed nations and therefore conferred status on the owner. Little thought was given initially to the software or the materials required to use it or to the methods of utilization. (p. 77)

Nearly the same sentiment is echoed by Altbach (1987, p. 161). When decision-makers are misled about an innovation, if they are uninformed, or if they get "stars in their eyes," the result can have serious consequences. Sadly, the same lack of insight was also true when educational technologies were first being exported from developing nations. Chadwick (1970) observed, "the potential of real availability of satellites and related technology has 'turned on' more than one country to the use of [ITV] without necessarily ascertaining if this innovation fits with other resources of the country or adequately addresses the problem of the country" (p. 47).

Cox (1971) saw, first hand, how donors can markedly misjudge compatibility issues. On a trip to West Africa to study innovative teaching methods and use of instructional media, Cox found language laboratories that were not in use due to the failure of the outside donor agency "to recognize the consequences of the fact that adequate technical service was unavailable at the location of the institution. Even worse, two of the three installations had never functioned properly, due to improper original installation and failure of the equipment supplier to subsequently correct the errors." (Cox, 1971, p. 80). The result? Eventually one of the labs had to be shut down and completely re-outfitted as the humidity had ruined the equipment. No trial period was planned for and the result was an incredible waste of resources – resources that developing countries cannot afford to mismanage.

Another possible reason for the mismanagement stems from a basic economic principle: supply and demand. Leaders in developing countries recognize the fact that funding agencies are predisposed to funding certain projects. Schramm (1977) observed more than 20 years ago that "the size of necessary support suggests that the willingness of the assisting agencies to support certain kinds of projects might have had something to do with the media that were chosen" (p. 144). The World Bank, a major monetary force behind any development initiative for four decades now, has heavily advocated the introduction of computer technology as part of its structural adjustment programs (Hawkridge, 1991). Given that the supply of money awaits the "right" demands, it is no wonder that leadership of any project in a developing nation needs to build in technology-related language. This is often done, as previously noted, without the regard for an understanding of implementation or long-term costs.

Such oversights are easily explained when one realizes the vicious cycle that exists: lack of technology in a developing nation means that very few people are trained to use it. When these people become school and government leaders, they have to make decisions about adoption and implementation about which they may know very little (Michele, 1987). The lack of

properly trained people is problematic. Without expert outside counsel, they can make decisions based on poor perceptions, which results in a continued dearth of proper implementation and education about innovations. All the while, new managers continue to be trained "outside" of the innovation. And what happens to managers that are trained? Many know that greater opportunities exist either in private business or outside their own country, creating a knowledge vacuum that perpetually inhibits development opportunities (Hawkridge, 1991).

Implementation

Hawkridge (1991) describes four reasons that might inform decisions to implement computers in schools in Africa. These reasons inform a potential adopter's perception of the relative advantage of computers. Policy decisions, which are based on the perceptions formed, directly impact the implementation. The first reason Hawkridge describes is the *social rationale*, which states that "since schools prepare students for life, they should prepare them to deal with computers," (p. 59). Typically, this leads to classes created by the Ministry of Education (or related entity) in which students are exposed to computer technology, and may even have classes about computer parts, but do not actually have computers to work on. These types of classes exist in Malawi at teacher training colleges (A. Chiponda, personal communication, November 2001) and presumably elsewhere. The *vocational rationale* holds that students should be taught computing for job-related purposes. This translates into the creation of classes to train students for careers in information systems. The challenge of the vocational rationale, as Hawkridge (1991) notes, is that a computers are a necessity (schools cannot afford these) and only a small minority of students would be eligible to take the classes. However, it is the one rationale that seems to carry the greatest weight in places where computers are being implemented (p. 60). A third reason is the *pedagogical rationale*. The thinking that follows this particular rationale is that students learn better with computers. Hawkridge (1991) states that this reason "may well be the one that commands the greatest support among educators," (p. 59), but there simply is not any empirical evidence that states that one media is any "better" than another (Clark, 1983; Schramm, 1977), so it is a problematic assumption at best. Finally, there is the *catalytic rationale*, which sees computers as change-agents in an of themselves, bringing about change in teaching, curriculum, and administration. According to Hawkridge, the pedagogical and catalytic rationales present real problems for governments in the developing African countries;

> The cost of developing and marketing suitable educational software is so high that very few countries have attempted it (none at all in Africa). The rest are importing software are doing without it. Those importing it are usually unhappy with what they get, for educational and cultural reasons. Those doing without it are giving up hope (p. 59).

Admittedly, Hawkridge's report was written more than a decade ago, but the economic and educational conditions of many African nations have not improved, so it is plausible to believe that the challenges remain the same today as they did in 1991.

Once an innovation has been adopted, it is commonly re-invented (Rogers, 1995). Re-invention is, as it sounds, "defined as the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation" (p. 175). Re-invention is not necessarily "bad," and can in fact make an innovation more useful (in the long term) to its adopters. Two examples of re-invention in educational technology, one of hardware use and the other of concept use serve to illustrate this point. After ITV had been used in Samoa for some eight years, observers noticed that it was no longer being used to do all of the core teaching (which it once had), but was being used "more sparingly and more discriminatingly." (Schramm, 1977, p. 172). Observations by Croft (in press) of experienced primary school teachers in southern Malawi show how they have re-invented the innovation of learner-centered pedagogy

to fit their local culture. Although the teaching guides created by the Malawi Institute of Education state that the teachers are not free to change content, many of the experienced teachers do. They allege that the curriculum is created by people who do not know children (Croft, in press). Because the children come from an oral culture, the Malawian teachers use song to help maintain discipline and lend support to the content. This is not learner-centered pedagogy as conceived by Western-education models, but the innovation, once adapted for local use, has a positive impact. Croft urges readers to consider learner-centered teaching from a broader view; it is a process likely to be re-invented depending on the culture of the teacher.

Observability and Confirmation

The theory of perceived attributes states that if an individual can observe the results of and innovation, adoption will take place more quickly (Rogers, 1995). A component of the innovation-decision process theory indicates that in order for an innovation to be sustained, the impact of the technology must confirm the expectations of the adopter. If the outcomes do not meet the expectations, it is quite likely that use will be discontinued (Rogers, 1995). In the context of developing nations, the challenge to observability and confirmation include lack of clear policies, lack of evaluative procedures, and a reliance on poor research to confirm results.

The importance of clear policy direction for the adoption and implementation of innovations should not be underestimated, since “from the first few days of a new experiment, important, determining, and often irreversible choices are made. These early choices give shape to a new program, and they also set in motion other patterns which govern subsequent choices” (Hall, 1991, p. 127). There are times when goals to implement technology are so ambiguous that the effect of the technology cannot be measured or observed. The goal of radio clubs in Niger (LeFranc, cited in Wells, 1976) was to “contribute to educational development, to cultivate democratic leadership, and to integrate adults into the national community” (p.16). Evaluators for the innovation could not possibly observe or measure outcomes if these goals had been fulfilled, so any decision to continue or discontinue use of radio clubs would not be based on good data. Chadwick (1970) also states that analysis must start at existing goal statements, “frequently the first apparent problem in the system is the inadequacy of these statements of goals and objectives” (p. 48). Weiss (1998) speculates as to the cause of such “fuzzy” goals:

> Part of the explanation probably lies in the practitioners’ concentration on concrete matters of program functioning and their pragmatic mode of operation. […] But there is also a sense in which ambiguity serves a useful function: It masks underlying divergences in intent. Support from many quarters inside and outside the program agency is required to get a program off the ground, and the glittering generalities that pass for goal statements are meant to satisfy a variety of interests and perspectives. Everyone can agree on improving the neighborhood, where they might come to (verbal) blows over identification of the specific outcomes they have in mind. (p. 52)

The glossing over of goals and objectives has serious ramifications. Often, when the time comes to demonstrate the innovations, it is “poorly done and at such expense that cost questions [begin] to be asked” (Ely, 1990, p. 77). Quite recently, the Danish government pulled its embassy and all funding of development projects (close to US$170 million) in three sub-Saharan countries partly as a result of financial mismanagement (UN-INRI, 2002).

Breslar (2000) reports a number of innovative pilot projects in educational technology being carried out in the West African countries of Mali and Ghana, but none is backed by a central policy. Instead, many of the projects are funded by disparate international agencies. The projects, although all are promising, do not contribute in a coordinated manner toward specific national educational goals.

Even with clear goals, programs must have effective evaluation plans (Buaful, 1984; Chadwick, 1970) to succeed. Such a posture would create an evaluation system that would, on a formative level, discover information that could be continuously fed back into a system to improve it. Wells (1976) agrees, pointing out that evaluations should not focus on the comparison of traditional instruction versus instruction with technology, but should exist to monitor progress. The media comparison studies, so prevalently used in early ETV research in an effort to "prove" its effectiveness (for a compilation of such studies, see Russell, 1999), should be avoided altogether as time and again, the research shows no significant difference between achievement in traditional learning achievement and learning via ETV, computers, or any other media (Clark, 1983; Schramm, 1977). If potential adopters are looking to confirm certain ideas about learning with technology based on poor research, a cycle of non-adoption can only continue.

One benefit from evaluations that monitor progress would be data about the costs of innovations. Funding of educational technology projects by an outside agency can be both a blessing and a curse. The blessing, of course, results from large amounts of money for start-up projects – developing countries often are quickly infused with instructional television, expert advisors or media creation experts, computer networks, etc. The curse, however, occurs when project funding is depleted. Many testify to the fact that the reliance on outside aid means the projects whither when aid is withdrawn or their impact becomes marginal (Butcher, 1998; Hawkridge, 1991; Schramm, 1977; Thomas, 1987). When governments realize that parts, training, and upgrades consume a huge amount of money, there is no incentive to continue. The Niger project "stalled" after reaching only 20 classrooms due to lack of government funding, and an ITV station in Senegal "went dark" when funds from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) dried up (Schramm, 1977). Typically, after only a few short years, officials who must make a decision on an innovation *observe* only the costs involved and *confirm* reasons why they should not adopt the instructional innovation for the long term. For a fair evaluation, projects must have a longer life than what many are afforded (Emekauwa, 1983; Schramm, 1977).

Individual Innovativeness

Discussion thus far has focused on the behaviors of potential adopters, but not all adopters react in the same way. Rogers' (1995) theory of individual innovativeness categorizes adopters based on their inclination to adopt an innovation. The categories of "ideal types" (p. 263) include: innovators; early adopters; early majority; late majority; and laggards. Innovators are those who, because of their willingness to take risk and the amount of resources at their disposal, take the lead role in introducing innovations into a system. As has been previously mentioned, many educational technologies are introduced by agencies outside of developing nations. The innovators, then, are typically foreign nationals from developed countries. Hawkridge (1991) writes that teachers and ministry officials in many African nations are still at the "knowledge" stage of the innovation-decision process and consequently, "among them are few innovators and even fewer adopters of computers for education" (p. 60). If there is research on educational technologies created and diffused at the local level in developing countries, it is very limited.

How do teachers in developing nations, inevitably the people who must ultimately implement educational technologies fit into adopter categories? "Successful change, particularly change involving sophisticated and pervasive use of technology, requires both bottom-up and top-down involvement and support" (Schneberger & Jost, 1994, p. 786). Some educators are early adopters and some are laggards. Returning to the studies of teacher attitudes in Nigeria (Ajibero, 1985; Akinyemi, 1986), one can see that a majority of professors would be early adopters if given the chance. Conversely, the primary school teachers, as a group, would be

least likely to implement technology and might need a good deal of convincing – and certainly a good deal of training – before they would use classroom innovations.

Oftentimes, educators themselves have very little say in what innovation is or is not adopted. Decisions to adopt innovations are typically made at top administrative levels (Hawkridge, 1991; S. Nyirenda, 1995a). For example, a report on the development of an information communications and technology policy in Botswana proposes that it can only succeed "if there is real commitment to it by all levels of government management and staff" (Magetse, 1997, Conclusion, para. 1). No mention is made of teachers in the report except when it describes required training that they will need to take. The exclusion of teachers from the adoption decision process creates resistance to change, especially as some technologies may make them feel as though their job is threatened (Schramm, 1977). Supplementary use, according to Schramm (1977) is most likely to earn teacher approval, because "the teacher is somewhat suspicious of large educational reform projects when they are built around media, particularly when the media are used for core teaching; this arrangement threatens the classroom teacher with replacement" (p.195). Although they are likely not going to be replaced, one must keep in mind that *perception* has more to do with the innovation decision process (which relies on the individual) than reality. In the introductory stages of computers in schools in Zimbabwe (Hawkridge, 1991), "almost all teachers [did] not see the relevance of computers to their work, and indeed teach in schools with no computers" (p. 66). If teachers are unable to see the value in educational technology, whether it be computers, calculators, or overhead projectors, they are rather unlikely to embrace training on those technologies and less likely to try to implement them for educational means. This generalization is true of teachers in developed nations, as well (Chin, 1994; Hoffman, 1997; Margerum-Leys & Marx, 1999; Meltzer & Sherman, 1997; O'Neil, 1995; Peck & Dorricott, 1994).

Summary

Diffusion of innovations is a specialized type of communication, according to Rogers (1995). The communication is specialized because it deals with one kind of knowledge – innovations. Rogers' (1995) theories of the innovation decision process; perceived attributes; rate of adoption; and individual innovativeness help illuminate the diffusion process.

Although the potential for positive change exists with many innovations, they are not always adopted. The relative advantages of a technology must first be understood by the potential adopters, which happens through a variety of means. This same knowledge and subsequent observations then inform the decision to keep or abandon an innovation. Trial periods allow an adopter to experiment with an innovation in a local context, but such periods are not always feasible or possible depending on the type of technology, how it is funded, and the availability of support systems needed to do pilot testing. Once an innovation has been implemented, the adopters watch factors that they perceive as important – to some it might be availability, to others it might be effectiveness, and to many, it might be cost. If the innovation does not meet perceived needs, it is typically abandoned.

Individuals play a central role in the diffusion of innovation. Innovators, opinion leaders, change agents, and adopters are all classified under Rogers' theories and each has an important impact on the diffusion process.

Educational technology, as an innovation, has often been looked to as a way to solve educational problems or ameliorate existing instruction. Examples from El Salvador, American Samoa, Nigeria, Mali, and other developing nations are considered under a general outline of Rogers' diffusion theories. It is evident that funding is the key issue in diffusion of innovations in developing countries. Among the lessons to be learned from past experience include the fact that concrete goals, a clear understanding of cultural context, and an effective communication

strategy must be a part of any educational technology project if there is any hope for an innovation to be sustained. Next, in the examination of distance education in Africa, the reader will see the implications of various pieces of diffusion research in many instances.

Distance Education in Africa

While Africa is a widely diverse continent of cultures, languages, religions, and beliefs, many of its countries share some unfortunate commonalities. Of the 49 countries listed as "least developed nations," 35 are found in Africa or just off one of its coasts. One common problem faced in all developing nations in Africa – in fact in all developing countries – is that of education (Tam, 1999).

Education has been and continues to be linked with economic prosperity (Carnoy & Samoff, 1990; DeYoung & McKenzie, 1989; Fägerlind & Saha, 1989; Michele, 1987), and therefore innovative approaches to education are important issues to decision makers. "Distance education," writes Tam (1999), "has become…the anthem of comprehensive national development" (p. 24). To meet challenges posed by high drop-out rates, lack of infrastructure to handle large numbers of secondary students, a scarcity of qualified teachers, high costs of formal education, the inability of tertiary institutions to accept more than a few thousand on-campus students, and a generally low quality of instruction at the primary and secondary level, decision makers have turned to distance education (Aabenhus & Kenworthy, 1996; F.B. Brown & Brown, 1994; Chung, 1992; Demiray, 1995; D. Eastmond, 2000; Hawkridge, 1991; Perraton, 2000; Shrestha, 1997; Sibanda & Northcott, 1989). In developing nations, distance education is viewed as a low cost alternative that can expand traditional, formal education; it is not solely a supplement to an existing education system (Jenkins, 1989; Rumble, 1989).

Both Tam (1999) and McIsaac and Gunwardena (1996) express the fact that distance education works in the global context largely due to the fact that it operates on an economy of scale. Enrollments in distance education programs around the world, especially in Asia, dwarf the enrollments in any university (private or public, virtual or traditional) in North America. For example, it is reported that the Open University of Turkey has nearly 600,000 registered students (Demiray, 1995). The Office National d'Enseignement et Formation à Distance (National Office of Distance Learning and Studies) in Algeria indicates enrollments of more than 100,000 students (International Centre for Distance Learning (ICDL), 2002). India has more than 50 distance education providers (D. Eastmond, 2000), and the Indira Gandhi National Open University, by itself, had close to 145,000 students on its rolls in 1996 (Panda, 1992). The Chinese Television University reported 1 million students enrolled in 1985, and more than 100,000 graduates per year (Hawkridge, 1988).

The large numbers cited above show the incredible demand that exists for education and training in the developing world. Numbers in many African countries would likely not be able to support the "open university" concept as populations are lower (Jenkins, 1989), but there is nevertheless a real need for programs that are large enough to meet a high demand: the population keeps growing and traditional institutions (at any level) cannot accommodate everyone. For example, to fulfill their promise of free basic education for all children in Malawi, the Government of Malawi literally "opened the gates" in 1994 and the school population increased from 1.9 million to 3.2 million by 1998 (MOESC & UNICEF, 1998). Their attempts, in some ways, are laudable, but when the students are ready to move from primary school into high school, they will face a transition rate of less than 10 percent (*ibid*). Where will the ones who do not get accepted receive an education after the eighth grade? According to Chung (1992), Zimbabwe has achieved universal basic education and has had remarkable expansion at the secondary level, yet "despite the massive expansion, the demand for secondary education continues to outstrip the supply of physical facilities and teachers" (p.1). In Malawi

and Zimbabwe, as well as many other countries in Africa, Asia, and the Middle East, leadership in the Ministries of Education face tough choices to provide quality education – as inexpensively as possible – to hundreds of thousands of eager learners (Perraton, 2000).

As Tam (1999) recognizes, however, “the larger the scale, the wider the door opens, but the more difficult it is to offer quality educational experience for our learners” (p. 26). While quality of education is one concern, a host of others must be addressed when considering any attempt to implement distance education, such as technologies used, policies, quality, cost, development, and assessment. This discussion will focus on distance education in Africa – itself a large and diverse enough area to make a survey formidable. To begin the discussion, a brief context will be provided. Example cases used to illustrate various models and systems in a sample of African countries will be provided.

The African Context

The use of distance education is not new to Africa (Jenkins, 1989; Kinyanjui, 1994; Sibanda & Northcott, 1989). Although some countries may be using it more effectively than others, and while some are now implementing computer networks and satellites rather than the more common correspondence (text-based) method, one of the earliest instances of distance education was the 1930s Correspondence College in Rhodesia [Zimbabwe] (Jenkins, 1989). A number of distance education institutions and organizations sprang up across the continent during the 1960s and 1970s. Due to the wide dispersion of distance education providers, a number of institutional and professional capacities exist on which to build (Kinyanjui, 1994).

One of the newest initiatives is the African Virtual University [AVU], originally a World Bank funded project and now an independent program based in Nairobi, Kenya. According to its own literature (African Virtual University, n.d.), the AVU has provided over 3,000 hours of language instruction since its inception (1997) and more than 24,000 students have completed semester-long technology courses. Currently, a total of 11 African nations take part in the AVU project, which is one of the first to deliver instruction via high-speed computer networks and the Internet. AVU has partnered with 26 “originating” institutions in the United States, Canada, and Ireland. The project is not without its detractors (Amutabi & Oketch, in press; Perraton, 2000); however, it seems to be the only model of in Africa (offered publicly, at any rate) of a distance education system akin to what one would now commonly find in North America, most of Europe, and developed parts of Asia.

Besides the World Bank, non-governmental organizations such as UNESCO, the Commonwealth of Learning (COL), and the International Council for Distance Education (ICDL) participate in developing distance education opportunities in Africa and encourage international cooperation (Kinyanjui, 1994). Regional professional organizations, such as the Distance Education Association of Southern Africa (DEASA), contribute to the training of distance educators, development of course materials, and facilitation of communication among its members (Kinyanjui, 1994).

Technology Overview

The AVU delivers its courses via high speed network connections. D. Eastmond (2000) calls attention to the following facts: developing countries (DCs) have 95 percent of the world’s computers; 75 percent of all phone lines are found in just ten developed countries, and access to phones is less than 0.3 percent in low technology countries. Butcher (1998) reports that in North America and Europe, 1 in 6 people have access to the Internet. In South Africa, one of the more developed nations on the continent, 1 in 45 people have access. In an average African country, access stands at 1 user for every 5,000 people. Hawkridge (1991) notes that another barrier in Africa is the lack of quality dealer networks, made all the weaker by the fact that much

technology that is purchased (or donated) is incompatible with other systems. Prices "high technology" parts in most African countries is outrageous; Cumming and Quick (cited in Hawkridge, 1991) report mark-ups of 1,000 percent over the European price. Attempts to bridge the "digital divide" are being made (e.g., the Leland Initiative/US Agency for International Development project, described in L.L. Smith, 2001).

Can developing nations afford not to employ high technology? The bigger question may be, as Hawkridge (1991) asks, Can they afford not to? Kinyanjui (1994) is emphatic, "developing countries cannot afford to forgo experimentation with new media and technologies," (p. 84). The choice of technologies for distance education is rather extensive given unlimited resources. A list of innovations includes various teleconferencing methods (audio; audiographics; video, etc.), broadcast radio and television, and print, video and audiocassettes, and computer-mediated (including web-based) communication (McIsaac & Gunawardena, 1996). Most African distance education providers, though, have relied mostly on print-based or face-to-face media, and in some cases, national broadcast radio (F.B. Brown & Brown, 1994).

One must remember that even in developed nations, a reliable postal system was for many years adequate and was associated with quality distance education (F.B. Brown & Brown, 1994; D. Eastmond, 2000). Just because it does not have an infrastructure to support advanced communication systems, does not mean that a developing nation cannot provide effective distance education (D. Eastmond, 2000, p. 2). The potential problem with programs like the AVU, in Perraton's (2000) view, is that they are technology driven. While its [AVU's] aims are defined in terms of raising quality and widening access, the institution is made possible only by the current state of development of telematics. Its choice of methodology seems to have been made because the technology was there rather than because of an appraisal of the merits of different ways of developing materials collaboratively or sharing them across frontiers (p. 147).

The most widely distributed and cost-effective method to date for many countries has been and remains print-based media (Altbach, 1987; F.B. Brown & Brown, 1994). Radio, which is a truly powerful medium and fairly cost-efficient is part of some programs, yet Perraton (2000) laments that it has "slipped into the background" as unwanted technology.

Models and Systems by Case Example

The International Centre for Distance Learning web site (International Centre for Distance Learning (ICDL), 2002) lists 27 countries in Africa and close to 150 institutions and organizations doing some form of distance education. This list does not include private firms, such as Cisco Systems Inc., which also conduct distance training. Some programs are projects run by churches, some by collaborative organizations, some by universities, and others directly by a country's ministry of education. The types of programs offered can be categorized in three ways: 1. Non-formal illiteracy, health, or vocational programs; 2. Formal basic or secondary education programs; 3. Teacher training programs. Most instruction is delivered by printed correspondence and is accompanied by face-to-face sessions with tutors. In many parts of Africa, radios and televisions are not widely distributed and computer-based learning is simply not an option. For a closer inspection of the various kinds of programs available, a sample of programs (each from a different developing African country) will be reviewed. Some of the countries listed only have one or two distance education initiatives; others have multiple systems.

Botswana. The Botswana College of Distance and Open Learning (BODOCOL) is a parastatal[1] organized by the country's Ministry of Education. The students who enroll in

[1] An organization independent of the government but retaining governmental ties by way of funding (in the United States, the closest approximation to this type of organization is the US Post Office)

BODOCOL courses study to prepare either for the Junior Certificate (test taken after 10th grade) or General Certificate of Secondary Education (test taken in last year of senior high). In 1999, a total of 5,600 students where enrolled either in the exam tracks or in course subjects. The course material is printed and distributed regional education centers and non-formal education offices, where students can also meet with tutors. A 30-minute radio spot, per week, gives advice and support to BODOCOL students (South African Institute for Distance Education [SAIDE], 1999).

Ethiopia. Offering secondary courses in Amharic, English, math, and the sciences, the Department of Adult Education (DED) in Ethiopia is a fee-based system intended for students who have been recruited by the DED. Instructional materials are printed for self-study, and there are bi-annual face-to-face sessions with representatives during which students are to discuss administrative concerns and evaluate courses. As of 1992, however, the DED was reported as being inactive in its distance education efforts due to under-financing and under-staffing (Inquai, 1992). Formal primary school instruction in Ethiopia is supplemented by radio broadcasts developed by the Department of Educational Mass Media (DEMM), a branch of the Ministry of Education. Prepared in the studios in the capital, Addis Ababa, the audiotapes are physically transported to eleven broadcasting stations around the country. Television broadcasts of math, English, science, and technology instruction, transmitted by the Ministry of Information and National Guidance, go out to students in junior high school (Gupta, 1991). While not technically distance education (Inquai, 1992), the “schools broadcast” at least demonstrates the potential outreach capabilities should Ethiopia pursue larger-scale degree granting programs.

Ghana. The Ghana Broadcasting Corporation oversees a non-formal distance education program intended for illiterate, subsistence farmers scattered across the northern part of the country. Although its objectives are loosely defined, its goal is to stimulate agriculture and improve prospects for personal and economic growth. No certificate or degree is granted. What radio instruction exists is done to support face-to-face instruction. Unfortunately, outdated and neglected equipment, along with an overworked staff does not lend quality to the program, and many broadcasts are repeated to fill air time. The staff itself is responsible for writing and producing the educational materials. The courses focus on health issues, civic issues, and occupational (agricultural) skills. A positive aspect that is reported, however, is the growth of independent “adult functional literacy” groups” outside the pilot area; community and social groups are also forming as a result of the teaching sessions (Yaroh, 1995).

Kenya. Kenya is one of the leading providers of distance education, with seven institutions or organizations listed by ICDL (2002). The African Virtual University, mentioned earlier, is headquartered in Nairobi, Kenya’s capital city. The AVU has had success in educating students in a variety of subjects, but it has also been the focus of some discontent. In October 2000, the Kenyatta University was closed temporarily as a result of student rioting over a proposed mandatory e-mail fee of around $10 per term (Amutabi & Oketch, in press). A program that more closely reflects a typical Kenyan distance education organization is the College of Adult and Distance Education, which offers programs for primary school teachers, field health workers, and illiterate adults. In 1985, the three programs had an enrolled of just over 8,000 students. The primary school teacher training course is (or was) fee-based, costing enrollees about four months’ salary. Admission to the course is based on an application process; only a small percentage is admitted. Both teachers and health workers do not stop work for their studies, but take courses as they carry out their duties. Due to Kenya’s emphasis on examinations and certificates, most curriculum is didactic in nature; some attempts are being made to introduce critical thinking activities. Very few courses make use of radio broadcasts because of the lack of equipment. Therefore, traditional face-to-face sessions are used in combination with correspondence materials. Individual tutors have the responsibility to provide

feedback on students' work – one tutor might have up to 2,000 students. Overall, the barriers of low technology and lack of skill in English (the language of instruction) hamper at least some distance education efforts in Kenya (Holmberg, 1985).

Malawi. The Malawi College of Distance Education (MODE), established in the mid 1960s and once considered a successful program (F.B. Brown & Brown, 1994), is now defunct, although there is some speculation by educators from Malawi that it will be revived in the near future (H. Mjoni Mwale, personal communication, December 2001). In 1993, just before the Ministry of Education converted the MODE's Distance Education Centres (DEC) to Community Day Secondary Schools (*SSTEP Malawi*, 2002), MODE reported an enrollment of 35,000 students. The courses offered led to either a Primary School Leaving Certificate (grade 8 exam), the Junior Certificate (grade 10 exam), or the Malawi School Certificate of Education (grade 12 exam). The material for the courses was developed by course writers and tutors, and teachers (who were not qualified to teach secondary courses and were not trained in distance education methods) led face-to-face instruction at the DECs around the country. Some radio broadcasts supplemented course material. Currently, Malawians do have access to other distance education opportunities, though not to obtain a school certificate. At least one private company, Cisco Systems, offers network administration training through the University of Malawi's Polytechnic college. (SAIDE, 1999d).

Two separate, privately funded distance education programs, both aimed at teacher-training, have been implemented in Malawi over the past couple of years. One of the initiatives, funded by the United Kingdom's Department for International Development, is the Malawi Integrated In-Service Teacher Education Program (Demis Kunje, 2002; D. Kunje & Chirembo, 2000; Stuart & Kunje, 2000). The MIITEP program is run by personnel from the University of Sussex, England and the Centre for Educational Research and Training, Chancellor College, Malawi. In response to the overwhelming demand for qualified teachers due to the Free Primary Education program instituted in 1994, the focus is on the training of primary school teachers. Students enrolled in the program, all of whom had to hold a Malawi School Certificate of Education (MSCE, or high school diploma) prior to admittance, forego a normal two-year residential course at one of the teacher training colleges (TTCs) in Malawi. The program's initial structure consisted of: an initial three-month residency period, a period of supervised/mentored teaching in the schools combined with distance learning modules, and a final one-month residency period concluding with a certification exam. Kunje (2002) reports limited success due to inadequacy of supervision, inability to change the lecture-based orientation of most trainees, and the lack of interaction between distance learners and their staff. However, the program has trained an extraordinary number of teachers (more than 14,000) in about a third of the time it would have taken if done through the conventional teacher-training program. As of 2001, new cohorts were being recruited for a modified version of the program.

The second initiative, known as SSTEP (Secondary Schools Teacher Education Program), is funded by the Canadian International Development Agency, and is coordinated by two Canadian universities (Brandon and Simon Fraser), a private Canadian corporation, and Domasi College, Malawi (*SSTEP Malawi*, 2002). Like the MIITEP program, SSTEP relies on a combination of residential training, supervised teaching, and distance instruction. Unlike MIITEP, however, the distance education courses are much more extensive. The participants enrolled in SSTEP are actually primary school teachers who teach secondary classes at Community Day Secondary Schools (CDSS). These schools, formerly known as Distance Education Centers, account for 80% of all secondary school enrollment in Malawi (*SSTEP Malawi*, 2002). Whereas MIITEP created approximately five distance texts, the SSTEP program has more than 130 total modules. Each student must enroll in two disciplinary fields, which means that he or she would have to take between 16 to 20 distance education modules.

Students who complete their work, their supervised teaching experience, and their exams receive a Diploma of Education (DCE), accredited by Domasi College.

Mauritius. A small island country lying of the southeast coast of Africa, Mauritius has five distance education providers. One of the earliest providers, the Mauritius College of the Air (COA), "has survived and grown probably as a result of two of its most outstanding characteristics – its pragmatic ability to innovate and improvise, and the quality of its products" (Dhurbarrylall, 1995, p. 179). Yet, despite its ability to improve and innovate, the parastatal has had trouble fulfilling the role of a distance education provider, barely resembling a "college" at all. It has taking the role, instead, of doing school broadcasts and preparing national information campaigns for the government. One of the most difficult tasks has simply been in evaluating its impact or sustainability, which "is partly because its objectives have never been very specifically defined" (Dhurbarrylall, 1995, p. 178). A new Division of Distance Education, established in 1994, seeks "develop institutional capacity for delivery of distance education programmes; offer adult and continuing education using distance education methodology; cater for the needs of those willing to gain access to education after having left the conventional system" (SAIDE, 1999c, Description, para. 2).

Namibia. A tertiary institution in Africa that offers a distance education program, the Polytechnic of Namibia's Distance Education Center (DEC) offers technical-vocational courses through correspondence courses. The objective of the program is to educate people who can then transfer their skills to industry. The program is designed for working adults, most of whom live in the capital area. More than 1,500 students enrolled for classes during the program's inaugural year in 1997. Students have the choice of two certificate programs, two higher certificate programs, two diploma programs, and one bachelor's degree (nature conservancy). The certificate and diploma programs are in public administration and police science. The materials, printed in English, are available at regional study centers, but students also receive face-to-face instruction from tutors; some audiocassettes are available. Unlike tutors in other programs, tutors in the DEC do not grade papers. Grading is left to course lecturers at the Polytechnic's main campus. Students must maintain a 40 percent assignment completion rate in order to qualify to take the final examination; a 50 percent is required on the final to obtain the qualifications sought (SAIDE, 1999e).

Sudan. The Sudan Extension Unit (SEU), established in 1985, developed out of a need to education thousands of refugees who had settled in eastern Sudan due to war and drought in surrounding regions. The courses, written for adults who have stopped their education or who are in need of health-related training, are printed in the capital of Khartoum. Attempts to print materials at satellite offices failed due to unreliable power supply. Students rely on books, small group study sessions, and face-to-face sessions with tutors, as any use of media, to include audiocassettes, is infeasible. The SEU, beside offering basic literacy, refresher and basic education to refugees, also offers a pre-school teacher training program and health education courses. The pre-school teacher curriculum is quite rigorous, though the only requirement for enrollees is experience working with children. There are a total of 11 subject areas to be taken via correspondence. Each course is supplemented with workshops, day schools, and observation. Students have a total of 78 hours of face-to-face instruction. The program evaluation includes five written papers; completion of teaching practice; completion of a hand book; and completion of 10 assignments. Only if students have maintained an overall passing mark can they sit for the examination. Similarly, students who complete the basic education program can register to take a final exam – a passing grade results in an O'level certificate. In 1990, the SEU had approximately 6,000 enrollees in all its programs (Arbab, 1995).

Tanzania. Originally established to provide educational opportunities to South African exiles living outside the country during the Apartheid government, the South African Extension

Unit (SAEU), was created in 1984 and based in Dar es Salaam, Tanzania. Once non-racist policies were finally adopted in South Africa and its exiles repatriated, the SAEU turned its focus to refugees from Burundi, who had come to live in the western part of the country. Students take eight modules of English language instruction, using printed materials, audiocassettes, and face-to-face instruction. The assumption is that the beginning student has no knowledge of English (Burundi is francophone), but by the end of the course, they will be sufficiently prepared to take a final exam. As of 1999, approximately 2,000 students have completed the program. They do not receive formal credit for their work, but achieving the minimum proficiency allows them to become teachers or possibly enroll in Tanzania's Open University. A second SAEU program educates local government officials about the country's transition to a multi-party democracy. Topics included are in administration and finance. The course material is essentially printed, but audio support in the form of cassettes and national radio broadcasts is also available. The SAEU develops some of its own material, but in other cases, buys content from national and international institutions. Infrastructure to support more robust communication among learners and tutors, such as the Internet is too expensive to implement, but the use of tutors for face-to-face instruction is also costly. Tanzania, like all African countries, faces funding and resource challenges (Kotta & Gololo, 1995; SAIDE, 1999b; SAIDE, 1999g).

Zambia. Zambia holds the distinction of being one of the first countries in Africa to offer university level distance education courses (Sibanda & Northcott, 1989). Because of its long history with distance and open education, Jenkins (1989) has called it the "steady state," (p. 48) although Zambia's distance institutions, like all in Africa, has experienced its share of difficulties (Jenkins, 1989). Of the various distance education providers mentioned thus far, none uses video except for schools broadcasts. The University of Zambia, which offers certificate and diploma programs for adults, make occasional use of both video and audio to deliver its courses, although video use has declined due to lack of funding and lack of production personnel (J. E. Nyirenda, 1989). Print media, of course, are still used heavily. The university offers a Certificate of Adult Education (CAE) and a higher level Diploma of Adult Education (DAE). The goal of both is to "to train individuals in planning, administering and delivering adult education activities …[and enhance] their skills to manage adult education in a democratic way" (SAIDE, 1999a, Description, para. 2). Students in the CAE and DAE program take 16 courses for each, ranging from Foundations of Adult Education, to Sociology of Adult Education, to Communication Theory and Practice and Non-Formal Education. A strength of the program, to be sure, is its affiliation with the University of Zambia. The university has the resources to send its top students out of country, to Britain, the United States, or elsewhere, to pursue a doctorate in adult education. It is reported that the department of Adult Education and Extension Studies has the highest number of lecturers with doctoral degrees (SAIDE, 1999a).

Zimbabwe. Zimbabwe has its own Open University (established in 1993) and has had a very successful teacher training distance course (Chivore, 1992; Jenkins, 1989). To illustrate a private distance education provider, however, this section will provide some details about the Rapid Results College (RRC). The RRC is not a new institution in southern Africa – it has wide name recognition and a good reputation. RRC charges modest fees for its courses, which are designed for adults, especially those who do not have access to traditional, class-based education. Courses designed to impart business, professional, and vocational skills. Many of their students are residents of Zimbabwe, but students from neighboring countries (Zambia and Malawi) also enroll. Unlike most programs mentioned to this point, the RRC conducts no face-to-face sessions, but students are free to form independent study groups if they so desire. Tutors in the employ of RRC do not teach, but grade assignments and provide feedback. Like the other programs, however, the RRC materials are by-and-large print-based; newer medias are deemed too expensive. Radio use works against fee-based systems since anyone can tune in and receive the instruction for free. Another unique feature of the private organization is that it

offers student counseling; “Before registration, students are given counseling in the form of career and subject choices. Such counseling is given by writing to students who are very far from the college. Students are also given booklets, which give them all necessary information about how the college operates and how they can use services effectively” (SAIDE, 1999f, Learner Support, para. 1). Tutors are given guidelines (but not training, per se) in ways that can help assist the distance learner. Students can contact the tutor about problems they may be experiencing, but tutors are expected to “troubleshoot” problems they may spot and provide assistance. Besides good “customer service,” the RRC provides a wide range of quality courses produced by experts and edited by distance and adult education specialists at the college. The RRC is an autonomous organization, not part of the Ministry of Education, but it is reported to have close ties with Zimbabwe’s department of Adult and Non-Formal Education. Despite its connection the government, the RRC faces the perception by government officials that distance education is in some way second rate and therefore does not enjoy the highest level of support that it could (SAIDE, 1999f).

Models Summary

Although the models described above are but a small sample of the many distance education programs in Africa, they are representative of the typical administration, use of technology, and target audience. For the most part, distance teaching and learning is oriented for adult learners who seek training or a certificate, as very few open universities exist. The overwhelming majority of systems, even among the ones not listed, use printed materials and tutors to deliver content. Educational technologies such as radio, television, and the Internet are not widely used because they are not widely available. Many of the systems described are supported by the national ministry of education, but a lack of funds often means that the quality or consistency of the programs is not good. The one exception to this seems to be the private endeavors, such as the RCC. The costs of creating the programs is not widely reported and was not discussed, but some attention will now be given to the economic issue as it is one of the foremost arguments for the implementation of distance education.

Cost Issues

Consensus certainly exists on the possibility that distance can be cheaper than traditional modes of education (Chung, 1992; Jenkins, 1989; J.E. Nyirenda, 1983; Perraton, 2000; Shrestha, 1997). Perraton (2000) outlines two foundational arguments that have informed ideas about cost savings: media equivalence and educational theory. The first theory (backed by many years of the media comparison study) states that all media are equally effective in transmitting learning content – equal, in fact, to a teacher. Given the equivalence, some believe that learning with a printed study guide is just as effective as learning from a teacher, so there is no “loss” when media are switched. Traditional education costs money because buildings must be built, the power plant maintained, teachers paid, etc. The economic theory simply posits that when buildings and teachers and electricity (desks, etc.) are not needed, educational costs decrease. But the two arguments, as Perraton makes clear, are theoretical. What really matters is whether cost savings are actually being realized by institutions that provide distance education. Unfortunately, the data for cost savings (at least for developing nations) is not at all clear due to the fact that one-to-one comparisons are quite difficult to make (Chale, 1992; Perraton, 2000). One thing is certain, “had distance education been more expensive than traditional forms of education, it would never have come to be regarded as a useful instrument of State educational policy for the provision of initial or extended education…” (Rumble, 1989, p. 99). Where data do exist, Perraton’s (2000) comparison of costs of various types of programs led him to the following conclusions:

Basic education: the cost of basic adult education compares favorably with other methods, but not so favorably with costs of primary education; cost considerations for basic education make it difficult to see how it could be scaled to a national level; a strong argument can be made in favor of distance education used as one component of in-service training for adults working in the field.

Open and distance schooling: secondary education offered at a distance can have lower unit costs than traditional classroom based education; in situations where educational technologies (of any kind) are used to supplement rather than replace schooling, there are additional costs incurred.

Teacher education: most projects reviewed showed a savings of between one half and two-thirds of conventional teacher education programs, although it is a qualified savings depending on the type of supervision methods employed

Higher education: open and dual-mode institutions sometimes have a lower cost per student, but not always a lower cost per graduate.

Overall, there does seem to be some support for the argument that distance education can save money, but there are times when it is only a comparable means to conventional schooling or training (Rumble, 1989).

The notion of potential savings attracts policy makers, but there is another side of the issue. Because distance education may be less expensive to produce, it is often seen as "cheap" and therefore governments do not commit enough funds to the proper development of distance education systems (Jenkins, 1989). Also, the perception of lower-cost also seems to influence perception of the kind of education one has received.

> The greatest disservice that commercial correspondence colleges have done for distance education is to set a standard for distance education on the cheap. In an environment where second rate correspondence education was the norm, it has been exceedingly difficult to persuade their governments to finance their institutions to a level where they can provide courses of a high standard. (Jenkins, 1989, p. 47)

Another way to help alleviate the impression of "cheap" education is for government involvement, even if the funding is provided by outside agencies. The goals of any distance education program should be integrated with those of the national government. The government's active participation may help alleviate any misgivings about the quality of distance education (Chung, 1992).

Summary

Developing countries the world over face a number of common challenges in their education systems. Some problems due to policies that keep people from attaining as much schooling education they desire, and other problems are due to a very real need for funds and infrastructure to handle the immense demand for education. One solution to such problems has been and continues to be distance education.

Some countries in the developed and developing world, such as Britain, Hong Kong, India, China, and Turkey, have built up massive open university systems that operate on economies of scale. The schools are set in a context where demand is high the ability to produce and distribute quality distance education materials exists. African countries, some of which have had a long history of correspondence courses, vary in their ability to produce sustainable models of distance education. The demand for education is large, but not like that in Asia and Europe. The relatively lower demand, however, should not be mistaken for a lack of interest – nearly all African nations have experimented or are sustaining some form of distance

education. However, the absence of infrastructure, human resources, clear policy guidelines, and at times, unstable central governments create an atmosphere where otherwise stable, sustainable programs have little chance to gain a firm footing.

In cases where distance education efforts do solidify, the models used still tend to rely on more traditional methods of delivery, such as the use of printed materials and tutors or supervisors. The ability to make good use of "high technology" is slowly changing, but for now, many who develop distance learning materials must orient their system to one still largely divorced from communications innovations that would make the "massifying" (Bates, 2001) of distance education programs feasible.

The issues related to cost are difficult to determine based on the scarcity of good data, or at least common data points that can be compared (Perraton, 2000). In general, distance education programs can be cost-effective under the right conditions. The down side of making education less-expensive, though, is the perception that it is at the same time "cheap" or of low-quality (Jenkins, 1989). In order for distance-based education to work most effectively, governments should become actively involved and consider policy changes that would truly extend equal education opportunities to all who seek knowledge.

Due to the relatively high cost of production to start and sustain distance programs, an increasingly popular option is for an institution from a developing nation to partner with an institution in the developing world to bring in funds, resources, or personnel. As good as the idea may be, past experiences by various institutions in partnership arrangements has met limited success. A review of those experiences is thus in order.

Co-production of Learning Materials

The following section briefly reviews selected reports that describe co-production of educational materials. The purpose of this discussion is to raise some of the problem areas associated with co-production and collaboration. Surely, collaborative efforts can engender fruitful and rewarding professional, social, and economic relationships (Hawkridge, 1979), but the particular focus here is on the challenges and cautions as described by various authors. This discussion is not to serve as a warning against co-production, but simply offer insights that may mitigate problems arising in other projects.

What is Co-Production?

Hawkridge (1979) notes that co-production refers to the work by at least two institutions agree to share resources, human and financial, in the creation of course components. He mentions, however, that some take a less stringent view of co-production and might argue that a course produced by one institution but done in consultation with a second, or perhaps a course created by funds from two or more institutions but not created by either one of them. Such is the case in Garnier's (1974) description, which states co-production is "any agreement between several bodies for the pooling or sharing of certain resources (human, technical, financial) in the planning, production and use of educational media" (p. 3). Another way to think of co-production is "collaboration," although the term is not as explicit about an actual product. Collaboration could as well be about producing ideas as it is about producing actual materials. Active involvement by all parties in a collaborative agreement is necessary, (Neil, 1981 cited in Moran & Mugridge, 1993, p.1), as is the presence of an agreement between to institutions. Whether one prefers the term co-production or collaboration in distance education, the concept is essentially the same: at least a bi-lateral effort to extend available resources, increase the quality of existing materials, respond to various political pressures, and possibly introduce innovations in various societies (Neil, 1981 cited in Moran & Mugridge, 1993).

Problems and Cautions in Co-Production

Despite the lofty goals often found in memoranda of understanding, co-production efforts are not often successful (Hawkridge, 1979; Moran & Mugridge, 1993). Developing a comprehensive list of the reasons for the failures would be difficult because programs are under different pressures and are fallible in any number of ways. A few specific examples of failures should give the reader an appreciation for problems associated with collaborative efforts.

As far back as 1955, a few European nations, all members of the International Council for Educational Media, were attempting to work together to produce instructional materials for television. As reported by Garnier (1974), it took three attempts (each using a different management approach) to create something that all members could implement. The final attempt was not entirely what the council first envisioned. Each member nation was to contribute personnel, materials, funds, and so on and work together to build materials to be used in each country. Garnier reports that the attempts suffered from a lack of coordination and technical difficulties. The final attempt was a major compromise: each member helped finance the efforts of a single producer. Evidently, better coordination for multiple participant approaches was tried on numerous later occasions, but all the projects succumbed to the same problems of the first attempts. One of Garnier's observations is that "co-production is easier for organizations which are used to working together or at least meet and exchange material regularly" (p. 8). He also suggests that no more than two or three partners be involved for any given project . Several authors writing in Moran and Mugridge's (1993) collection of collaborative efforts in distance education agree, citing that understanding the organizational culture of partner institutions is crucial. Too many institutions in a partnerships results, necessarily, in only a surface-understanding of complex politics and agendas (p. 154). But even just two same-language institutions with similar goals and an amiable relationship does not guarantee success. Moran and Mugridge (1993) lament that after four years of collaboration between their two institutions, "[they] had achieved agreement on one course, several meetings, an enjoyable friendship, and little else" (p. 151). This is another example illustrating Hawkridge's (1979) claim that international co-production infrequently results in the production of courses. Instead, non-educational materials are more often the result.

Kareem's (2000) study examines the collaborative efforts of two universities, one in the United States and one in Asia, to produce an on-line course. The process described in the study reveals three phases in the collaborative process: initiation, pre-development, and development (p. 79). The most pressing challenge arising from the collaboration was technological in nature; the developing Asian partner university did not share the same technological resources as the U.S. institution. The same problem is described by Garnier (1974) when writing about the attempts in the 1950s of various European media partners who tried to co-produce materials. Other problems the group identified in Kareems's report include "cultural differences, availability of expertise, institutional procedures, and financial and time differences" (p. 80). These, he states, were minor, and the challenges notwithstanding, the project was "a great experience for both groups" (p. 78). Unfortunately, the author does not provide enough description of the challenges to provide useful suggestions for how to deal with similar instances.

Summary

A brief review of various collaborative efforts has produced the following list of insights related to collaborative efforts:

1. Collaboration necessitates deep understandings between institutions.
2. Collaboration efforts are rarely successful with regard to the actual co-production of materials.

3. Partner institutions from differing parts of the world will likely face technological and communication challenges.
4. Problems of increasingly complex relationships (too many decision levels) and a mismatch of organizational cultures and politics can threaten collaborative efforts.

The one issue that has stood out time and again in each section up to now has been that of context. Those who ignore the physical, academic, and cultural environment – all of which make up the concept of context – do so at peril of completely negating any work they may do to innovate. Consideration of context, flatly put, is imperative; the next section offers more evidence why.

The Contextual Imperative

Sadly, the matching of educational conditions to their proposed solutions happens less frequently than one might expect. Many who write about the diffusion of innovations in developing nations (innovations that often make up part of a distance education system) warn against the "foreign expert" who lacks real knowledge about the culture into which the innovation will be implemented (Abrahams, 1993; Chadwick, 1970; Ellsworth, 2000b; Ely, 1989; Marchessou, 2000; Michele, 1987; Rogers, 1995; Shrestha, 1997). The image of a rescue helicopter best typifies the ignorant consultant, who

> swoops in on a three day trip, has four meetings with educational officials, two parties with the education minister, and leaves behind a two page memorandum specifying all the 'answers' needed by the country, with no recognition of the cultural, social, or political factors which may affect the problem. (Chadwick, 1970, p. 48)

Rogers' (1995) notion of *homophily*, or likeness between individuals who interact with each other, can only be brought about if, as Michele (1987) describes, "the consultant has lived in the developing society for an extended period, if they speak the local language, and if they spend much of their time in close communication with local educators…." (p. 132).

Tam (1999), writing about cultural relevance in distance education, makes clear that neocolonialism is a danger when methods are brought in out of context:

> No one questions the universality of either the theory or practice of distance education. But to pretend that they might mean the same thing and be practiced in the same way in developing countries as occur in the developed world may lead to committing what could be regarded as a 'type I error' in education. Even within the developing world, situations differ from country to country. […] There seems to be a second generation colonization of the educational world in which the colonizing organizations completely and wantonly disregard what occurs in and the need of the local environment (p. 26)

The "modification of wares according to local needs" (Shrestha, 1997, Part V, para. 62) can only occur when the promoters of such wares understand the end-user level (the individual) reaction to products and methods.

Towards the goal of creating such culturally relevant models, various researchers have called for a close inspection of cultural considerations in distance learning (Bates, 2001; Creed, 2000; Gillani, 2000; Goodfellow, Lea, Gonzalez, & Mason, 2001; Henderson & Putt, 1993; Wilson, 1999, 2001). Goodfellow et al. (2001) discuss the need to consider both how "intercultural issues manifest themselves within these global learning communities…and how we can develop sites and practices that are created specifically for cross-cultural communication" (p. 67). Their studies of a British-based master's degree course in Open and Distance Education, offered by the Open University, adds credence to the idea of *cultural distance* as expressed by Wilson (1999; 2001) and similarly by Creed (2000). The study by

Goodfellow et al. (2001) outlines what the authors' discovered (through qualitative inquiry) to be four key areas related to cultural differences. Each of the recommendations is explained briefly below.

Cultural otherness. Even though students interacted with tutors through asynchronous means, they still perceived a difference between their own culture and that of the tutor. The fact that this form of communication was still able to transmit "broad cultural markers" (p. 75) suggested to the researchers that cultural messages are transmitted even unwittingly and even through non-traditional means of communication.

Perceptions of globality. When asked whether or not they thought the content to be "global," or representative of many societies, some students felt the course could be more representative of particular national contexts, but many agreed that the course created a global context because they had interaction with students from all over the world. The difficulty is, as the authors note, is creating the balance of both "global and local narratives" (p.77).

Linguistic difference. The study found that students whose second language is English did not necessarily have difficulty with reading or interpreting course materials that were produced in English or even in writing assignments in English. The discomfort arose, however, when they had to interact with other students by using English, which was done through asynchronous, electronic bulletin boards. The students were quite self-conscious about the limits of their linguistic adeptness and did not want to give the wrong impression of themselves.

Academic convention. The requirements of the Open University for assessment differ from how students might be assessed for competence in their own countries. The difference may also become evident in the way that learners interact with tutors, especially in regard to what the expect regarding feedback on and grading of assignments.

To conclude, Goodfellow et al. (2001) suggest that "any future design for cross-cultural communication in programs such as this should begin by making explicit the forms these narratives take, including ways they are embedded in institutional practice" (p. 80).

Wilson (1999; 2001) highlights the "cultural discontinuities" that arise in distance education (specifically Internet-based) settings. Among them are "worldview, culturally specific vocabulary and concepts, linguistic characteristics of the learner, learner motivation, and cognition patterns…" (p. 61). He points out a common assumption found in cross-cultural psychology research, which is that cognitive processing in other-culture learners is quite frequently different from the cognitive processing of the designer. He proposes that designers of online learning environments should provide metacognitive tutorials to help learners in other cultures interpret course content. The designers should also align reading materials with a learner's reading behaviors (particularly important in the case where instruction is in the second language).

Bates (2001) offers a number of suggestions for addressing the issues that arise when one institution creates a distance education to be used internationally. Included among them is the development of a close relationship between the exporting institution and the importing institution through active participation in course and policy creation; tailoring programs to local needs; assistance in building capacity in places where little human or technical infrastructure exists for the importer to create its own courses; and development of training programs for course developers to increase sensitivity to cultural issues.

One must realize, however, is that cultural issues do not, by themselves, constitute a sufficient context. Defined as "the circumstances in which an event occurs," (*American Heritage Dictionary*, 1993), context is created by numerous inputs (and outputs). An example of the debate of science instruction in Africa illustrates this point.

In the examination over why students in many African nations do poorly on assessments related to science learning, two diverging points of view have emerged, both of which are related to context. On one side of the debate, researchers contend that African students' problems in science stem from an inherent conflict between a traditional system of beliefs and values and the nature of Western science ideas (e.g., Akatugba & Wallace, 1999; Jegede, Fraser, & Okebukola, 1994; Shumba, 1999). They state, "for learners of science in non-Western cultures, these [socio-cultural] aspects have profound effects on their disposition to and proficiency in science learning" (p. 138). While this assertion is plausible and backed by research, a counter argument is raised by Dzama and Osborne (1999). They state that the problems of learning are not value-based in nature, but instead are related to the distinct lack of science oriented job opportunities ("vocational incentive") in many of Africa's developing nations. Citing their own research as evidence and taking from historical examples in Asia, Britain and India, Dzama and Osborne (1999) write that interest and achievement in science has not preceded scientific and technological growth even in developed countries. Additionally, the ascription of "cultural barriers" to science learning is not unique to traditional cultures themselves – such a view is rather ethnocentric.

> The learning difficulties confronting the African student are not peculiar to their culture alone; it is therefore misguided practice to focus research effort on a singular explanatory factors as if children living in the scientifically developed nations have had no such cultural obstacles to learning science. (Dzama & Osborne, 1999, p. 401)

L.A. Brown (1981), who writes about diffusion of innovations, forwards a similar notion, stating that adoption of an innovation is based less on how effectively ideas about it are communicated and more on the adopter's capacity to accommodate the infrastructure and market characteristics of the innovation. This may well predict that a program such as a on-line master's degree in instructional technology would not work because the infrastructure does not support web-based learning to any great extent and the academic environment itself does not have a huge demand for instructional designers.

While the views of each author assign different factors to science deficiencies or innovation adoption, what should be noted is the fact that all actually agree that *context* is what ultimately matters. In one case, socio-cultural context is deemed more important, in the other, the socio-economic context receives attention. Undoubtedly, factors from both contexts influence learning and adoption, which makes clear the need for a macroscopic view of context when it comes to designing instruction. As Dick and Carey (1996) observe, "information about the context in which learners will use instruction is extremely important as the designer begins to analyze exactly what skills must be included in instruction" (p. 20). The role of context analysis in instructional design shall be covered in the following section.

Summary

The role of cultural influences in the learning and teaching process cannot be understated. As Trueba (1988) remarks, "the conditions for effective learning are created when the role of culture is recognized and used in the activity settings during the actual learning process" (p. 282). As predicted by and described in research on diffusion of innovations, programs that remain insensitive to local contexts (whether social or economic) are likely not be adopted and most certainly not implemented (L.A. Brown, 1981; Rogers, 1995; Zaltman, Duncan, & Holbek, 1973). The concept of cultural distance (Wilson, 1999), which is implied in the work of others who research international aspects of distance education, describes the isolation the learner experiences when things like language, country-specific terms and expressions, and academic expectations do not match his or her own (Goodfellow et al., 2001).

Contextual concerns should cause one to focus on factors related to both culture and infrastructure. The literature view, to this point, has focused on various theoretical issues and examined the some models of distance education in Africa, to include the country of Malawi. The following section is a comprehensive examination of the Malawian educational system and provides the contextual background for the redesign of the ITMA program.

Malawi and its Education System

One of the first questions to settle when discussing the educational system of a given nation does not have to do with particular policies or infrastructure, but instead concerns the motivation behind educational policy. In Malawi, which like any developing nation has deep and serious problems to overcome in each sector of civil society, the question, "Why educate?" can be addressed in several ways. The answer is dependent on a social goals, politics, leadership, and resources (Buchert, 1998; Graham, 1979). To address the question of "Why educate?" in the Malawian context, it would be helpful to understand some historical, political, and economic aspects about the country itself before looking at the make-up of its educational systems.

The Historical Context

When one speaks of the history of Malawi, there is no clear place to start. Some accounts begin with a pre-colonial period of the sixteenth century whereas others note, however briefly, its pre-historical period. Although it is not the purpose of this section to describe Malawi's geography or overall history at length, one should remember that Malawi lies at the southern end of the Great Rift Valley – a region where paleontologists are still discovering millions-of-year-old remains said to be ancestors of the modern homo sapiens. The first known human inhabitation of area now known as Malawi dates back at least 50,000 years ago (Nave, 1999). The recorded history is much more recent, and from it one learns about the migration of different tribal groups into the region and the eventual colonization by European nations beginning sometime in the 19th century. Marked by slave trade, wars, and domination by rulers foreign and domestic, the history of Malawi is one of continual subjugation (Nave, 1999).

The introduction of Europeans into sub-Saharan African is germane to the discussion of education in Malawi, as it is through the work the famous Scots missionary and explorer Dr. David Livingstone, that the foundation of formal schooling was laid. The purpose of the schooling at that time (1870s) was proselytizing in nature and had very little emphasis on anything other than reading, writing, and arithmetic (Malawi Education for All Assessment Group [MEAG], 2000). Shortly after the arrival of missionaries from the Commonwealth, the British government sought to further hedge the loosely-based Portuguese influence in the region that Livingston had called "Nyasaland." British trading companies purchased (stole) large amounts of fertile land and Nyasaland was made a British protectorate in 1891. It was not until the 1920s, though, that any provision was made for the education of Africans living in the area. It would be

another 20 years before secondary schools were established and even then, their structure and administration was tightly controlled by the colonial government. The British restrictions were marked by its control of who could attend school (the country's elite) and how children were prepared for life. A student's future role in society was determined by those in power (Lewis, 1999).

Colonial Education and its Effects

The colonial system of education, modeled on the British system, also impacted pedagogy (Altbach, 1982). It is an influence that extends into current education practices in Malawi and in other former protectorates. "Examination systems anywhere influence curriculum practices.... Since the examinations usually solicit fact-oriented recall answers, classroom teaching hardly ever goes beyond the transmission of facts to students" (Kanu, 1996). Students are selected solely on the basis of their individual performance in these "meritocratic" institutions (Lewis, 1999, p. 654) and as current educational administrators in Malawi point out, "the selection aspect attached to these examinations formed the genesis of the almost incurable syndrome of our education system to date: rote teaching of pupils to pass examinations" (MEAG, 2000, Colonial Period, para. 4). As will be seen later, teacher education programs at Malawian teacher training colleges and those sponsored by non-government organizations (NGOs) are trying to foster an approach that is less "traditional" and focuses more on student participation (Stuart & Kunje, 2000).

The purpose of colonial education was to perpetuate the British bureaucracy, as new subjects were brought into the primary curriculum "to make [it] more relevant and consonant with secondary education objectives of producing a cadre of clerical and evangelical staff to serve the civil service and the church respectively" (MEAG, 2000, Colonial Period, para. 4). Blake and Cooksley (cited in Harber, 1989) describe the goal of colonial education:

> It was largely to socialise a privileged minority into an elite culture. Students lucky enough to have this sort of schooling were not just taught the formal curriculum but also followed a hidden curriculum -- that of European manners, values, aesthetic preferences in art and literature and beliefs in the superiority of British or French political institutions. (p. 5)

Socialization, be it political or otherwise, is not only the heritage of colonial systems; it is recognized as an inherent goal in national systems of education where the state is undergoing transition from one political or economic system to another (Carnoy & Samoff, 1990). Schools in Malawi and in other British colonies were established early on as a means to inculcate students about values and mores of the "standard" political and social systems. The socializing process in schools can have positive effects such as the transmitting important cultural values to students (Kanu, 1996), but the danger is a "submersion" or "submission" of conscious thought to the existing power holders (Carnoy & Samoff, 1990; Freire, 1970; Kanu, 1996; Sicherman, 1995).

An example of less subtle attempts at socialization can be seen outside schools in national youth movements. Yogev, Shapira and Tibon (1982) describe the "Young Pioneers," a movement established by the Banda government in Malawi at the outset of the country's independence. Programs like the Young Pioneers were established to train out-of-school adolescents in the attitudes and behaviors of "modern" (as opposed to "traditional") persons. But because youth movements are state-sponsored, they are especially susceptible to governmental control where there is a single-party system (as Malawi was from 1964-1994). Due to the fact that they are controlled by a political group, "these organizations [are] often perceived as a means of gaining a greater support for the regime in remote rural areas" (Yogev et al., 1982, p. 213). The goal therefore turns away from a focus on training for useful, technical

skills and towards “political indoctrination” (p. 213). Although the Young Pioneers program was disbanded in 1993 by the Malawian army (Else, 1997), the political socialization of some youth in Malawi still continues, even if informally. A report by Agence-France Press (2001) describes terrorism by the “Young Democrats” (supposedly an organization within the United Democratic Front, Malawi’s ruling party) against both Christian and Muslim clerics and opponents of Malawi’s current president. The ultimate effect of both the formal and informal socialization process is the reinforcement of the ‘ruler vs. ruled’ paradigm – a legacy that continues even after independence.

The Purpose of Education

The British Protectorate of Nyasaland become the independent country of Malawi on July 6, 1964 and two years later it officially became the Republic of Malawi. Unlike the histories of other former British colonies around the world, Malawi’s independence arose with minimal bloodshed. This lack of a violent revolution, however, meant that many existing colonial systems remained in place, including the educational system. The civil vacancies left by British bureaucrats had to be filled by nationals and thus education became equated with status, as only those with education had access to economic and political power (Carnoy & Samoff, 1990). The purpose of education changed slightly but the focus suddenly turned to tertiary or higher education as educated Africans needed to fill posts being vacated by Western administrators. Primary and secondary education also needed to be expanded because of increased demand and the entire system suffered as quality was sacrificed for quantity (MEAG, 2000, Post-Colonial Period, para. 2). Chadwick (1970), states that this “expansionist approach” has as its goal to “enlarge the existing educational establishment as rapidly as possible, with very little change in the structure, logistics, content, or method" (p. 6). Unfortunately, this same expansionist approach has been applied within the past decade in Malawi (Ministry of Education, Sports and Culture & United Nations Childrens’ Fund [MOESC & UNICEF], 1998). It is the result of policy growing from the time of independence.

During the 1960s in the purpose of education as a means of development became popular in developing nations and even in underdeveloped areas of the United States (Carnoy & Samoff, 1990; DeYoung & McKenzie, 1989; Fägerlind & Saha, 1989; Michele, 1987). But the concept of development is ambiguous and means different things for different nations – it can relate to social, economic, political, or cultural goals and of course depends on the unique context of each nation (Buchert, 1998; Fägerlind & Saha, 1989). At the time Malawi was forming its own policies in the mid-sixties, there was a belief that education would bring about tangible economic change: “The aims of education were revised and broadened to raise the status of education to that of a vital tool for development” (MEAG, 2000, Post-Colonial Period, para. 1). Chadwick (1970) creates two categories of educational policy: productionist and democratic. In the former, educational systems are created to contribute as much as possible to national development through the production of goods and services. Democratic, or humanitarian, views of education value education for its own sake, and assert that a person should be able get as much schooling as he or she desires (p. 9). Additionally, Närman (1998) asserts that education is important to both the neo-liberal (read “productionist”) and alternative development ideas. The difference between them, he states, lies in who takes responsibility for furnishing educational infrastructure and what the curriculum includes (p. 114). So which view, productionist or democratic, appears in Malawi? Does “education as a vital tool for development” refer to the development of the person, or the economic development of the nation? In his inauguration speech, Malawi’s first democratically elected president under the multi-party system introduced in 1994, Dr. Bakili Muluzi described the introduction of the Free Primary Education (FPE) program and stated three objectives:

1. Increase access to primary education

2. Eliminate inequalities in enrollment
3. Build a strong socio-economic base within society and enhancing civic education on the social and economic benefits of education at the community level. (MOESC & UNICEF, 1998, p. 11).

In a document prepared by the Government of Malawi, *Free Primary Education: The Malawi Experience 1994-1998* (MOESC & UNICEF, 1998), the text of the foreword by Muluzi makes the goals of education in Malawi quite clear:

> One fundamental question for which my Government needed an immediate answer was why this country continued to suffer such wide spread poverty after 31 years of political independence. It was quite evident that a fundamental element of such poverty was the high illiteracy rate, particularly among the rural population. . . . This state of affairs dictated that my Government focus its development policy on poverty alleviation, with universal primary education as the main feature. (iii)

There continues to be debate about the linking of education to economic development. The ideology that gives rise to this connection is human capital theory (Fägerlind & Saha, 1989). Arising out of economic theory, Blaug (1987) describes the theory's relation to education:

> The principal theoretical implication of the human-capital research program is that the demand for upper secondary and higher education is responsive to both the variations in direct and indirect private costs of schooling and to variations in the earnings differentials associated with additional years of schooling. (p. 102)

Fägerlind and Saha define it a bit more succinctly, stating that human capital theory "rested on the assumption that formal education is highly instrumental and even necessary to improve the production capacity of a population. … [it was argued] an educated population is a productive population" (p. 47). This understanding, they point out, was consistent with Western values. The assumption of a relationship between education and economic development is the rationale for much of the international community's funding initiatives (Fägerlind & Saha, 1989; Hawkridge, 1991; Lewis, 1999; Narman, 1998). The relationship of international funding to educational initiatives in developing nations often means that such culturally-based assumptions find their way into national education policy. As Buchert (1998) notes, a number of countries receiving international aid have internal policies dictated from *without*. Although the empirical evidence to support such the notion of human capital theory is lacking and although it suffers from a number of methodological inadequacies (Carnoy, 1992; Fägerlind & Saha, 1989), it is clear that Malawi, which has long been a recipient of international aid, has developed part of its educational approach with the hope that better educated Malawians will create a more prosperous country. Given the fact that universal primary education has only been available to all Malawians since 1994, the economic impact will not be felt (if it can be) for some time.

The objective of universal primary education[2] was be accomplished by making it free. Until 1994, various school fees were in place. The fees included tuition and uniform costs, which were to that point mandatory in Malawian schools. It should be noted that school uniforms and fees are another example of a colonial holdover, but such policies were also one small part of a number of societal regulations imposed on Malawians by its former "life president," Dr. Hastings Banda, who held power under a one-party autocracy from 1964 to 1994. The regulations set forth by Banda included laws that regulated the length of men's hair and even the length of women's skirts (Nave, 1999). The fees and uniforms costs effectively prevented children from impoverished homes from attending school. The Government of Malawi (GOM) had begun to

[2] Primary education in Malawi extends from grades 1-8.

scale back fees starting in Standard One [3] and by 1994, the fee elimination had extended to Standard Four (MOESC & UNICEF, 1998). Finding that enrollment still had not improved to the degree they would have liked, the GOM formed policy in mid-1994 that included the abolishment of all forms of fees, undertake the financing of all primary schools, assume responsibility for providing teachers and learning materials, and encourage increased female participation (MOESC & UNICEF, 1998).

The GOM goals are closely aligned with those set forth by the United Nations "World Declaration on Education for All" made in Jomtien, Thailand in 1990. The Jomtien document, in fact, is called the "main take-off point" for Malawi's FPE policy (MOESC & UNICEF, 1998, p. 9). The goals outlined at Jomtien are associated with economic development, but include references to the development of civil society as well. Reiterating Article 26 of United Nations *Declaration for Human Rights* (1948), which states that education is a basic human right and that education should be free and compulsory at least in the primary years, the EFA document (World Conference on Education for All, 1990) describes basic education as a way for people to meet their educational needs – needs that include literacy, numeracy, and problem solving – as a way for them "to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions, and to continue learning" (Article I, para. 1).

As Carnoy describes, basic education "lays the groundwork for a healthier, more productive society – one that can sustain development and ensure full participation in a rapidly changing world" (p. 79). Carnoy (1992) writes that education improves the conditions of children in four ways: it creates an environment where better educated parents can provide better health, emotional, and intellectual care for their children; it promotes a culture of learning and allows children to become productive members of society; it is pervasive and cuts across race and class boundaries, allowing even the most disadvantaged children the opportunity to learn; and it helps develop a nation by creating a culture that is flexible and responds to changing economic conditions (pp. 79-80). These beliefs are echoed in the GOM's *Free Primary Education* document (MOESC & UNICEF, 1998):

> It has generally been accepted that education leads to economic growth by reducing poverty, improving health and lowering fertility rates. . . . The studies have also shown that the rates of return for basic education outweigh those from higher levels of education. Hence, there is a global shift from an emphasis on higher and technical education towards primary education. (p. 9)

But what conditions is the government in Malawi seeking to improve through educating their young people? A brief overview of demographic and economic conditions will calls attention to the challenges faced by all Malawians.

Demographic Context of Malawi

Issues of survival and quality-of-life as raised in the Education for All (1990) declaration are rather important in Malawi. It might be said, however, that these two issues impact education more directly than education impacts them. An overview of current living conditions in the country is provided in order to give a social context of the educational system.

The 1998 census data published by the National Statistical Office of Malawi (NSOM) states that the country has a population of 9.9 million people, a figure which has grown by an

[3] In Malawi, the word "standard" is equivalent to the U.S. word "grade." In secondary school, "form" is the term for "grade." Thus, Standard 1 is "first grade" and Form 1 is "ninth grade."

average of nearly three percent per year since its first census in 1901 (1998)[4]. Given its small land-mass (approximately 119,000 square kilometers)[5] and relatively large population, Malawi is one of the most densely populated countries in Africa (World Almanac and Book of Facts [WABF], 2001), with an estimated 105 persons per square kilometer. One of Malawi's neighbors, Tanzania, has a population three times as large as Malawi, yet has a population density of only 97 persons per square mile (WABF, 2001). Of its nearly 10 million inhabitants, 86 percent of Malawians reside in rural areas; the major cities of Lilongwe (the capital city) and Blantyre (the former capital) are home to nearly 80 percent of those who live in urban areas or townships. Most of Malawi's population resides in the Central and Southern districts; 12 percent live in the Northern District.

Malawi's population is quite young overall; nearly 73 percent of the persons counted in the 1998 survey were age 29 or less (this is up only 3 percent from the 1977 census). Females (5.06 million) slightly outnumber males (4.86 million). Life expectancy in Malawi, as in all African nations afflicted with the AIDS/HIV epidemic, chronic disease, and poor quality health care, is extremely low when compared to industrialized nations (World Health Organization [WHO], 2000). Whereas most citizens of western nations, to include Australia, have a life expectancy of around 70 years, the WHO report (2000) lists the average life expectancy in Malawi in 1999 to be 29.4 years, which ranks the third lowest of 191 nations, just behind two other African nations, Sierre Leone (25.9 years) and Niger (29.1 years). The WHO figure is not universally reported (WABF, 2001, for example, lists the life expectancy in Malawi as 36.3 years for males and 35.7 years for females), but even the "higher" number is alarmingly low. Infant mortality in Malawi is 130 deaths in 1,000 births, giving it one of the highest infant mortality rates in the world.

The leading cause of death in sub-Saharan Africa is AIDS, which claimed more than 2.2 million people in the region in 1999 (WHO, 2000). Malawi itself has an HIV infection rate of about 15 percent and an estimated 70,000 Malawians died from AIDS in 1999 (Central Intelligence Agency, 2001). As can be imagined, it is an epidemic that has ramifications outside the health care system, affecting both the economic and educational sectors of a country (Moffett, 1994; Panafrican News Agency, 2001; Simmons, 2001). One source reports that nearly 600 Malawian teachers die each year from AIDS (Panafrican News Agency, 2001), while another recent report claims more than twelve times that number (7,500) die from HIV/AIDs each year (Matebule, 2002). This decimation of the teacher corps comes just at a time when Malawi is trying to train as many teachers as possible in order to meet the demands of universal primary education. Interestingly, HIV infection has been found to be more prevalent in populations with more schooling, better access to housing, and higher socio-economic status (Dallabetta et al., 1993; Glynn et al., 2001).

Even when the effects HIV/AIDS scourge are not considered, Malawi agrarian-based economy contributes to the fact that it is one of the most economically disadvantages countries in the world. Of the economically active population, 78 percent is involved in subsistence farming, and a mere 13 percent are considered wage or salaried employees. The annual per capita Gross Domestic Product [GDP] is $940, a figure 30 times less the average annual GDP in the United States. Examples of the impoverished conditions and lack of infrastructure in Malawi abound. Twenty-two percent of Malawians have no access to a toilet facility, and 78 percent report access to a traditional pit latrine. The latrines themselves are neither standard in construction nor sanitary and contribute to a host of communicable diseases, prompting a call for wider hygiene education programs (Grimason, Davison, Tembo, Jabu, & Jackson, 2000).

[4] Except where otherwise noted, all facts and figures cited in this section have come from the National Office of Statistics of Malawi (NSOM), 1998

[5] This is approximately 46,000 mi^2, or roughly the same land area as that of the US state of Pennsylvania. Malawi's eastern side borders the ninth largest lake in the world, Lake Malawi.

Safe drinking water is also problematic. One quarter of the population draws water from unprotected wells; only 2 percent of Malawians use electricity for energy. More than 90 percent heats and cooks with wood and uses paraffin for lighting – less than 5 percent of the total population uses electricity for cooking and lighting (NSOM, 1998).

As can be seen, Malawi faces a number of challenges – challenges that are sadly ubiquitous in many developing and underdeveloped nations. It is unlikely that any one solution can completely rectify the inequities and problems, but the Government of Malawi, backed by international support, has decided that education is at least one area where immediate reforms will yield tangible solutions.

Formal Education in Malawi

Although the Malawian system of education is under transition in both scope and structure (MEAG, 2000), a fairly accurate description of its current state can be provided. This section will describe organizational aspects of Malawi's educational administration, the levels of formal education, and teacher training. Non-formal and vocational education will not be addressed as it falls outside the supervision of the MOE. Distance education in Malawi is described in another section of this document.

Unless otherwise noted, information presented in this section comes from three sources: the Malawi Education for All Assessment Group report (MEAG, 2000), the Free Primary Education report by the Ministry of Education, Sports and Culture (MOESC & UNICEF, 1998), and the 1998 Population and Housing Census by the National Statistical Office of Malawi (NSOM, 2000). These sources will not be individually referenced hereafter unless a direct quotation is used or if there is a need to clarify ambiguities.

Administration. Malawi's Ministry of Education (MOE) [6] oversees all levels of the country's formal, public education system, including education at the tertiary level. The Ministry is the largest government employer, with more than 60,000 civil servants (Matebule, 2002), more than a third of whom are teachers (S. Nyirenda, 1995b). The ministry's chief executive is the Secretary of Education and is a presidential appointee. Two Principal Secretaries, one for basic education and the other for higher education and seven directors, or Sectional Heads, assist the Secretary in the control, supervision, and coordination of such activities as planning, formation of policy, training, and budgeting. The administrative sections include: Director of Planning; Methods Advisory Services; Secondary and Higher Education; Basic Education, Human Resource Management; and Accounting Services.

Malawi is divided into three political regions, the North, Central and South. Within each region is a MOE office – there is an office at Mzuzu in the North, Lilongwe in the Central region, and Blantyre in the Southern region. The MOE has six administrative divisions within Malawi and 32 Education Districts. Each division is led by a Division Education Manager (DEM); the districts are lead by District Education Officers (DEO). The DEO is the person directly responsible for overseeing community schools, particularly the primary schools. Each school has a head teacher who is the link between three entities: the DEO, the school community, and the Parent Teacher Association (PTA). The communication between the three organizations allows for governance, organization, and development of the school. Administration of the secondary schools and universities still fall under the purview of the MOE.

[6] For the sake of clarity, the Malawi Ministry of Education will be referred to as the "MOE." However, the Ministry has had a number of different names, to include: the Ministry of Education, Sports and Culture (MOESC); the Ministry of Education and Culture (MOEC); and most recently, the Ministry of Education, Science and Technology (MOEST).

The Malawi system of public education is “highly centralized” (S. Nyirenda, 1995b, p.599). The negative aspect of a centralized system is reflected in Nyirenda’s (1995a) study, which reveals the top-down nature of the system. Nyirenda illustrates the development and attempted implementation of the 1973-1981 Secondary Education Plan, which was developed by the MOE. While the policy had positive objectives, to include the introduction of more relevant education at the secondary level, ensuring efficient use of existing facilities, and increasing participation ratios, the plan was itself complex and although a mechanism for greater involvement of stakeholders in policy creation was in place, a “bureaucratic model of implementation” was pursued (p. 8). The bureaucratic model "assumes that the initial policy objectives are correct and do not require modification in the process of implementation” (p. 8). The supervisory staff in such a model concerns itself primarily with subordinate compliance rather than support. Furthermore, the relationship between the MOE and school administrations is described by Nyirenda as “a functional one in that it emphasizes large power distance between headquarters implementers and school level administrators and teachers, and attempts to avoid high uncertainty and high levels of collective responsibility by using a bureaucratic approach." (p. 10). The relationships thus established influenced the school-level personnel to call the Ministry of Education, the “Ministry of Dedication and Torture.”

Recently, however, there has been a move toward decentralization, as the MOE plans to strengthen the division and district levels so that administrators at those levels can implement plans with as little interference from MOE headquarters as possible. Both the school committee and the PTA are seen as a fundamental part of the decentralization process (MEAG, 2000).

Curriculum development and learner evaluation. Two separate entities are involved in curriculum development and evaluation in Malawi. The curriculum planning organization, the Malawi Institute for Education (MIE) was established in 1982 and is a parastatal. Since educational reforms 1994 were put in place, MIE has focused on three objectives: aligning the curriculum with the free primary education (FPE) policies; preparing textbooks and teachers’ guides for primary schools, and conducting research on challenges and problems concomitant with FPE implementation. The MIE also undertakes the training of in-service teachers.

The Malawi National Examinations Board (MANEB) is also a parastatal and is responsible for the development and administration of four examinations in Malawi: the Primary School Leaving Certificate of Education (PSLCE), the Junior Certificate of Education (JCE), the Malawi School Certificate of Education (MSCE), and the Primary Teachers Certificate of Education (PTCE). Like the British system from whence it sprang, the Malawi education system relies heavily on exams in order to certify students. The certificates earned at each level are quite important as “they are a license to university education or jobs, with most white-collar jobs requiring the certificate as a basic requirement” (Panafrican News Agency, 2000).

The extraordinary importance of the national exams, particularly the PSLCE, JCE and MSCE places incredible pressure on students, teachers, and officials within MANEB itself. The result over the past few years of such pressure has been examination fraud and low passing rates. As recently as October 2000, top MANEB officials were fired by Malawi’s president because of examination copy leakage (Panafrican News Agency, 2000). Despite efforts by non-governmental agencies (NGOs), such as the Danish International Development Agency, to fund reforms that would eliminate cheating (Gama, 2001), a more fundamental problem seems to be getting the passing rates to an acceptable level. For example, only 8,000 students passed the MSCE in 1997 out of the 28,000 who took the test. In 1998, just under 7,000 students passed out of a total 42,000 students taking the exam (16%). Pass rates for the MSCE increased in the 1999/2000 school year, but even so, only 20 percent passed. While the pass rate for the PSLCE is much higher – 71.8 percent are reported to have passed the 2001 PSLC exam – the rate has dropped in recent years. The reasons for low or declining passing rates abound, but the fact is

that it is a policy that Malawi educators need to seriously re-examine (Moracco & Moracco, 1980; Preston, 1993).

Pre-school education. Although it is not overseen by the MOE, pre-school education efforts in Malawi will be briefly described to provide context of the educational background of children entering the first grade of formal school (Standard 1).

With an estimated 10 to 20 percent of the Malawian population under six years of age, the need for pre-school education is great. The Pre-School Playgroup centers throughout Malawi have been funded by the GOM since the 1970s, but it is the non-governmental, Association of Pre-School Playgroups (APPM) that sets the direction for pre-school education. The pre-school objectives include the promotion of "the social, intellectual, emotional and physical development of children between the ages of three to five and half years … it focuses on 'education through play' and proper care of children in a healthy and friendly environment" (MEAG, 2000, Pre-school Playgroups Objectives, ¶ 1). Although the GOM had wanted to develop enough Community –based Child Care Centers to reach the 1.2 million children aged 0-6 by 1995, lack of infrastructure and trained personnel has slowed realization of this goal. Close to 55 percent of day care centers in Malawi are privately owned, and a number of NGOs besides the APPM exist to help provide early childhood care. The GOM has been unable to contribute toward the funding of pre-school education since 1997 due to budget constraints; therefore, the APPM must seek funding from donor agencies and NGOs.

Currently, fewer than 25 percent of children age 3-5 are enrolled in a pre-school facility. Even for those who do attend, no organized curriculum is being implemented (although some guidelines have been set forth). Although young children may receive some socialization skills in the existing pre-school centers, they go largely unprepared (socially and academically) as they enter Standard 1.

Primary education. As previously noted, the national leadership in Malawi has turned to education in hope of providing solutions for their country's economic and development problems. In accordance with the goals of universal basic education set forth at UNESECO conference in Jomtien, Thailand more than a decade ago, a great deal of attention (and money) has been given to reforming the primary education system, which covers Standards 1 to 8. The greatest indicator of the reform has been the increased enrollment of students. Statistics available from 1990 show a total of 1.32 million children enrolled in primary school, or 52 percent of the total age group. By 1998, the number of children in primary school more than doubled, with 3.2 million enrolled. A 1997 statistic shows the pupil-teacher ratio of 61:1 (MEAG, 2000).

Since education is not mandatory in Malawi, the increase is a direct result of a removal of the barriers that existed: a greater number of schools were built and tuition and fees were abolished. The move has of course created challenges in the areas of funding, infrastructure, provision of adequate materials, and sufficient numbers of teachers. "Part of the problem in terms of quality," states the FPE (MOESC & UNICEF, 1998) report, "is that FPE has been thrust on an already weak system" (p. 34). There has been some criticism of the Malawian FPE policy due to the strain it has put on resources and the large number of unqualified persons who have had to be employed as teachers. A researcher at the University of Malawi, Dr. Joseph Chimombo, believes that the FPE policy has actually harmed the educational system. Despite the high enrollment numbers, drop-outs are common, "the education system in this country has a very low holding capacity and many pupils who start school, drop out without attaining minimum literacy levels needed to contribute meaningfully to the development of the country" (African Eye News Service, 2001). This view is also shared by professional educators from Malawi whom this author has interviewed.

Besides external factors being problematic, internal or curricular problems also affect primary education in Malawi. The language of instruction for the first three years of school is Chichewa, one of Malawi's two official languages (English is the other). However, not all students enter Standard 1 speaking Chichewa or English; a number of tribal language groups are still spoken in various parts of the country. Rural children are especially at a disadvantage as many teachers often come from areas outside the local region and do not speak the children's language (Kelly, Tlou, Niles, & Nyirenda, 1997). Even though instruction in the local language is permitted, what textbooks exist are either in Chichewa or English (MOESC & UNICEF, 1998).

The curriculum was revised prior to the 1994 FPE implementation. Besides taking subjects in language, science, math, and civics, students also receive instruction in health (including AIDS prevention), sanitation, and agriculture. There is a total 13 subject areas with an emphasis placed on language and math instruction (D. Kunje & Chimombo, 1999). Some of the curriculum is not implemented due to lack of teacher training or due to the cultural or religious convictions of the instructors (MOESC & UNICEF, 1998). Additionally, the method of teaching the curriculum has traditionally been teacher-centered. Although the MIE has tried to rewrite curriculum in a way that emphasizes child-centeredness, many teachers are not trained in such methods.

An issue of importance for all levels of education is that of equity in gender representation. It is a fact that girls are underrepresented in Malawian schools, but this is unfortunately the situation in many developing nations (Daun, 1997; Stephens, 2000; Swainson, 2000). The Free Primary Education document (MOESC & UNICEF, 1998) is honest about this issue, noting that girls have a higher drop out rate than boys, that they "remain disadvantaged in terms of per capita spending at all income levels" (p. 28), and are negatively impacted by cultural beliefs and attitudes that discourage education for females and encourage "traditional" roles such as marriage and child-bearing. Social mobilization programs promoted by MOE, such as the Girls Attainment in Basic Literacy Education (GABLE) program sponsored by the United States Agency for International Development (USAID), help the Ministry achieve its goal of creating more educational opportunities for young women. The GOM has committed itself to alleviate gender inequality, but a number of factors besides making education free for primary children must be addressed.

Secondary education. The emphasis on the Free Primary Education program has helped realize the goal of universal basic education and reforms have resulted in a massive increase in students at the primary level. The influx of millions more students since 1994, however, has compounded problems in Malawi's secondary system, which is in no way capable of handling a commensurate increase in enrollment. Quite simply, FPE has created a bottleneck at the secondary level, which have historically enrolled but a fraction of primary school leavers (Fafunwa, 1990). For example, of the 120,000 PSLC examinees 1996, approximately 74, 600 passed (64%). The secondary schools, however, only had 8,000 "places" for incoming Form 1 (high school freshmen) students. The 9.3 percent transition rate from primary to secondary school reported in 1996 was expected to drop to as low as 2.3 percent according the 1998 FPE report. Another reason given for the lack of expansion at the secondary level has to do with its goals. Kunje and Chimombo (1999) note "the secondary school system in Malawi has remained geared to serving economic demands rather than social demands. This means that the development of the secondary school system is dependent on the expansion of the labour market and tertiary education" (p. 9). One is able to see the effect this reality has on the psyche of those wanting to pursue more education – secondary schools have only a 1.5 percent net enrollment rate (D. Kunje & Chimombo, 1999). Girls drop out in far greater numbers than boys by Standard 8, causing an even greater disparity in female representation at the secondary level

(35 percent in 1995/96 school year, according to Kunje & Chimomba, 1999). The drop-out rate and disparity in gender enrollments also account for the higher rater of female illiteracy (56%, as compared to 23% for males) in the country.

The official secondary school starting age is 14 years, but it is not uncommon to find students in Form 1 older than 18. Unlike primary school, secondary education is not free. Students' families are expected to contribute up to 50 percent toward their education (MOESC, 2001, Section V.b.5). Most public secondary education is offered at conventional schools, which number fewer than 300 in Malawi.

Schooling typically lasts four years, but is divided into two cycles. After the first two years, students sit for another exam, the Junior Certificate of Education (JCE). Those who pass may continue their education through Forms 3 and 4. The 1998 census report by NSOM indicates 86.5 percent of male students ages 14-16 were enrolled in school, while a slightly lower percentage of females in the same age group were enrolled (81.3). The next age bracket shows the disparity: of the 17-19 year old students enrolled in school, 72.9 percent were male. The problems related to the overall poor performance of girls in secondary school has only recently been studied and has yet to be addressed (Swainson, 2000).

Tertiary education. The challenge associated with an expanded primary school enrollment certainly has an impact at the secondary school level, but an increased number of secondary students at some time apply for what is already an extraordinarily small number of seats in the tertiary education system. The examination system has already been discussed and the pass rates are very low, but even those who do earn their MSCE cannot be guaranteed acceptance. For example, statistics by the USAID Economic and Social Data Service (USAID, 2000) show a total secondary school enrollment of 141,000 students in 1995 (out of 800,000 secondary age persons). In the same year, only 6,000 students were enrolled in Malawi's tertiary education system.

State-sponsored higher education in Malawi is composed of the university system, teacher training colleges, and technical training institutions. The largest institution, the University of Malawi, has six constituent colleges: Chancellor College; the Polytechnic; Bunda College of Agriculture; Kamuzu College of Nursing; and the College of Medicine. Two additional institutions were founded in the 1990s: Mzuzu University in the North and Domasi College in the South. Of the six teacher training colleges, two are run by churches, but since they receive government funds, the MOE dictates curriculum and staffing (D. Kunje & Chimombo, 1999).

The state-sponsored technical schools are not under the administration of the MOE. Eight technical colleges operate under the Ministry of Labour (these teach vocational skills like carpentry, etc.); the Malawi College of Accountancy is under the Accountant General; the Ministry of Home Affairs runs a police training college, and the Armed Forces College is under the Ministry of Defense. Additionally, five certificate nursing schools are run by the Ministry of Health and Population.

Students at the universities earn diplomas or degrees, whereas students in the teacher training colleges and technical schools earn certificates. Obtaining credentials of some kind is quite important in Malawi. Fafunwa (1990) remarks, "all African countries have placed undue emphasis on formal education and look down on non-formal and informal systems of learning…. This has resulted in 'certificate syndrome,' the demand for diplomas, certificates and degrees of all types" (p. 281).

Teacher training. Teacher training in Malawi is supervised by of the Ministry of Education and the Teacher Development Unit (TDU). Typically, teacher training lasts two years and takes place at one of the six teacher training colleges (TTCs) around the country (Blantyre, Karonga,

Kasungu, Lilongwe, Montefort, and St. Joseph's). Secondary school teachers are educated in the university system – either at Chancellor College (University of Malawi), Domasi College, or at Mzuzu University.

"Good education depends on good teachers" (Carnoy, 1992, p. 71). The GOM has seemingly taken to heart the notion that a quality teacher training program is the power behind an effective education system and has invested quite heavily in it (D. Kunje & Chimombo, 1999). Their commitment has been put to the test. The impact of the Free Primary Education policy on the primary school system was immediately felt when it became clear that many more teachers were needed. Since the six TTCs only have enough places for about 2,700 pre-service primary school teachers, a new training system was needed.

Previous attempts to train a larger number teachers, as reported by Kunje and Chimomba (1999), included the 1987 "Special One-Year Teacher Programme" (which trained between 400 and 600 teachers per year) and a 1990-1993 initiative known as "Malawi Special Distance Teacher Education Programme" [MASTEP], which sought to train 4,000 teachers over a three year period. Applicants who qualified for the MASTEP program started teaching immediately. They used a combination of distance learning materials, supervised teaching, two-month residential courses, workshops, and projects. Both the 1987 program and MASTEP had varying degrees of success, but neither model was continued due to a variety of logistical and financial problems (D. Kunje & Chimombo, 1999). In any case, neither would have been able to handle the much larger group of unqualified teachers hired in 1994.

Upon implementing the FPE policy the GOM recruited between 18,000 and 22,000 teachers for primary school positions (FPE, 1998) and brought another 5,000 out of retirement (Stuart & Kunje, 2000). Of those recruited, nearly 18,000 had no qualifications whatsoever. The new teachers attended a two and a half week training session before being placed in the schools. It was obvious that a better professional preparation was needed. The MOE (with help from donor agencies) created the Malawi Integrated In-Service Teacher Education Program [MIITEP] in 1996 (see D. Kunje & Chirembo, 2000; Stuart & Kunje, 2000). The plan of the MIITEP program was to train between 15,000 and 18,000 teachers in three years. To do this, regular teacher training at the TTCs was suspended and the plan was to train six cohorts of 3,000 students each year. Each cohort would take two years to finish their program and spend time teaching in schools (similar the MASTEP program), but a good deal more traditional, face-to-face training was made available. The certification the participants received was the same as a student who had enrolled in a traditional TTC. In their assessment of the MIITEP program, Stuart and Kunje (2000) report that as of 1999, 15,000 teachers had progressed either partially or wholly through the course. They recognize the following:

> Many more teachers have to be trained but the quality of applicants is below previously acceptable academic standards and there is neither time nor money to put trainees through a conventional 2-3 year training course. The schools – over-crowded, poorly staffed and under-resourced – are not conducive training environments. MIITEP tried to square the circle, and it is hardly surprising that its first attempts should fall below initial expectations. It seems inevitable that for the foreseeable future initial training will have to be done on the job, within the structural constraints created by the need to train large numbers over short periods of time. (p. 55)

For more information about the MIITEP program and another distance education initiative, the Secondary Schools Teacher Education Project (SSTEP), the reader is directed to the section on distance education in Africa.

Summary

The many challenges that face educators and education administration officials in Malawi are not new. A long history of domination by colonial powers, followed by a neocolonial government and polices that continued support class structures through social and educational policies has kept Malawi from realizing its full potential.

The new democratic government, elected just eight years ago, has turned to primary education as a way forward. Unfortunately, an already weakened educational system – weakened by lack of funds, by decimating health problems among students and teachers, by lack of infrastructure and materials, by exclusionary policies, and by lack of qualified personnel – is surely under the utmost strain as officials try to keep to their commitment of free basic education. The great number of students now in the system must be taught by someone, and Malawi is trying to train a large number of teachers. Disease, discontent, and apathy make the job difficult.

But through all the trials, there is hope for the future. One need only to talk to the wonderful people of Malawi and see that the spirit of going forward is quite alive. The task will not be easy – there is much work ahead. Work has begun in earnest is with the education of Malawi's young people. A literate populace and one that knows about the health risks associated with certain beliefs and habits is the only way to boost human capacity and in-country expertise. It is, as the Malawians say, "the way forward." But how are educational issues in Malawi to be addressed when help comes from the outside? Here, the discussion once again turns to a theoretical issue, the use of context in instructional design.

Context in Instructional Design

Contextual issues cannot be assumed; they must be explored and can be designed. From an education perspective, Tessmer and Richey (1997) define context as "a multilevel body of factors in which learning and performance are embedded," (p. 87). The multilevel nature of context is discovered through what is known as either a *context analysis* or *environmental analysis* (Dean, 1994; Tessmer, 1990; Tessmer & Harris, 1992; Tiene & Futagami, 1987). The preceding discussion provides examples of why context is important – it has a direct impact on the instructional equation. The following section will describe how context relates to instructional design [ID] and a method of context analysis.

An Overview of Context Analysis and Context Design

Context analysis and context design are two separate processes. In the first, the designer (or design team) conducts a thorough review of the environmental factors that have direct bearing on learning. Context design is proposed as a stage in the ID process (Tessmer & Richey, 1997), where designers make conscious, informed decisions to change the learning environment. Although various ID models indicate the importance of context analysis, Tessmer and Richey (1997) note that no specific, systematic means for designing context exists. Their model will be discussed shortly.

A context analysis may or may not include the same elements as the more commonly known *needs assessment or needs analysis* (e.g., Witkin & Altschuld, 1995). N. Eastmond's (1994) broad view of needs assessment, where he describes it as "a systematic inquiry into the most important needs to be met," (p. 88) underscores the similarity of the two analyses. Some would assert that the needs assessment tends to focus on "the exact nature of an organizational problem and how it can be solved" (Dick & Carey, 1996, p.18). The context analysis, on the other hand, is an examination of "physical and psychosocial factors that affect learning…a phenomenological approach to instructional design in that it seeks to describe the learning 'as it is' in the real world…" (Tessmer & Harris, 1992, p. 15). This definition implies that the

orientation is less on what needs to be learned and more on how what surrounds the teaching and learning situation affects and sustains (or diminishes) the educational process.

The goal of the analysis is "to describe where an instructional product will be used, how it will be used, and how it will be sustained" (Tessmer, 1990, p. 57). The foundational assumption behind the rationale of a context analysis is that it will improve the ID product (Tessmer & Harris, 1992), the point of which is to improve learning. An analysis that only improves the teaching process may not be at all useful to the student. For instance, a context analysis may indicate a need to arrange the physical space of the classroom in such a way that the teacher has easy access to the board or computer station. That same change could result in some students not being able to sit in such a way that is conducive to collaborative work. The focus, then, is on *learning* (p. 21).

Tessmer and Richey (1997) describe eight assumptions behind the context model they have created. Of the assumptions, four are briefly described in order to give the reader a sense of the ideas most pertinent to instructional design. First, it is assumed that context is "an influential and inevitable" (p. 88) aspect of all learning experiences. As learners try to compensate for unfavorable contextual factors, learning is reduced. Second, instructional designers cannot control context. The ID process may allow designers to factor in contextual influences, "mutually adjusting" (*ibid.*) the content, media solutions, evaluations, etc. to the surrounding environment. Another assumption states that contextual factors have a varying impact which depends on the characteristics of the learner, the instructional content, as well as the "intensity of contextual elements" (*ibid.*). For example, trainees in an Army basic training environment are less likely to be distracted by heat conditions (provided they are not too severe) as the climactic conditions are considered "part of the training." On the other hand, retail store manager trainees sitting in a hot room are likely to be quite distracted by the heat as it is not associated with the normal work environment. A fourth important assumption is that instructional products must be to some degree situation, or context, specific. Instruction that fits the environment "adjusts to context by deliberate design, rather than by evolving from unanticipated learner-controlled activities" (p. 89).

Also included in the Tessmer and Richey model is a general model of the dimensions of context. The three context types are designated as: *orienting, instructional, and transfer*. The first context circumscribes issues that influence learner motivation and preparedness. Embodied in the instructional context are the factors "directly involved in the delivery of instruction, the immediate physical, social and symbolic resources" (p. 91) surrounding the learner. The transfer context, called the "payoff context" by the authors (*ibid.*) is that which describes the environment in which the learner or trainee will use his/her newly gained knowledge. Within each of the three types of contexts just described are three levels of analysis: the learner, the immediate environment, and the organizational environment. A combination of the contextual types and levels gives one a truer sense of the "multilevel" nature of context as defined earlier.

A Means of Context Analysis

One model for conducting a context analysis has been created by Tessmer (1990) and Tessmer and Harris (1992). An outline of factors to be considered in a context analysis is shown in Figure 2. A host of questions and sub-questions are associated with each category. Some questions a designer might ask include: "How long will the product be used? What equipment is available for presenting instruction? How far must the participants travel to attend the training? Will the administrators present the instruction? Can sensitive equipment be stored in a safe location?" (Tessmer, 1990, pp. 57-61).

The decision about when to conduct a context analysis varies according to author. Dick and Carey (1996) place it after the needs analysis and goal identification. Based on their

experiences in developing multimedia projects in an international context, Tiene and Futagami (1987) advise that the context analysis should be the first stage of a project, as in certain instances, “circumstances mitigate against the introduction of such a project” (p. 283). They note, for example, the fact that for technologies to function in countries with severe tropical climates, an infrastructure to support proper storage and maintenance must be in place. Given the role of needs analysis, however, which is to determine in the first instance if an instructional solution is even warranted, it would seem that doing a context analysis as the initial step makes

	PHYSICAL ISSUES	**USE ISSUES**
INSTRUCTIONAL ASPECT	- Facilities - Instructional lifespan - Equipment	- Patterns of use - Reasons for use - Student-user characteristics - Administrator characteristics
Support Aspect	- Site distribution - Management and coordination - Seasons and climate	- Production services - Storage and delivery services - Dissemination resources - Support resources

Figure 2. Aspects of environment analysis. Adapted from (Tessmer, 1990)

an a priori assumption that instruction is the solution to a problem. Tessmer and Harris (1992) place context analysis as part of a ‘front end analysis’ (p. 16), implying that both an instructional assessment and context assessment occur at about the same time. They point out, though, that a context analysis certainly “takes place before decisions are made upon instructional strategies, media formats, and evaluation strategies” (p. 16).

Information for the context analysis can be collected in a variety of ways. Tessmer (1990) suggests some of the following: data analysis (documents), interviews, site visits, surveys, and small group (team) discussions (p. 61). The variety of data sources help an investigator triangulate and verify information about the context (Tessmer & Richey, 1997). With a proper context analysis plan, designers can bring into focus the many factors that more fully describe the learning environment. Once that environment has been described, information from it must be used in the instructional design process to create appropriate teaching and learning strategies.

Applications of Context Analysis to Instructional Design

Information gathered from the environmental analysis alone does not contain embedded information about how to use the results in instructional design. Dean (1994) outlines seven ways that context analysis might address instructional design concerns. Data from context analysis can:

1. Identify those who can help guide the ID process
2. Provide another way of specifying instructional goals and objectives
3. Assist in developing appropriate learning activities
4. Define the format of a program and describe the availability of equipment
5. Identify which methods of instruction people accept or resist
6. Frame an understanding of learner evaluation methods
7. Elucidate critical summative evaluation components

(p.66)

Those familiar with models of systematic instructional design (e.g., Dick & Carey, 1996; Gagné, Briggs, & Wager, 1989; Knirk & Gustafson, 1986) can see the relationship of Dean's (1994) outline to common ID tasks. Tessmer and Harris (1992) suggest a two-part process for designers who have collected environmental data. First, they suggest a comprehensive "environmental picture," in which the data are used to create a written description of the environment. This document is then submitted for feedback by others involved in the data collection process – either interviewers or interviewees. The final of section of this document should identify critical issues. The second stage, or "environmental blueprint," uses the environmental picture but is instead an analytic breakdown of context factors.

> The blueprint requires designers to list each environmental factor that they think will influence learning, describe how it will influence learning, and then describe how this factor will be accounted for in the instructional design tasks that will be completed. The blueprint is then consulted during the entire design process. (Tessmer & Harris, 1992, p. 163)

The authors provide an example of a blueprint that is quite easily reproduced. Simply, it requires the designer to list one environmental factor, describe how it might hinder or facilitate learning, and then asks how that factor affects goals and objectives, task analysis, content scope and sequence, instructional strategies, formative evaluation, and so on. These are the same categories outlined by Dean (1994). The overlap of the two methods posits a useful implementation strategy for designers.

Another perspective on the use of context analysis data, shown in Tessmer and Richey (1997), lists five steps:

1. Identify criteria for "successful" instruction.
2. Mitigate effect of inhibiting factors.
3. Install missing factors.
4. Secure or exploit facilitative factors
5. Monitor the contextual factors of orienting, learning and transfer context during their continued implementation. (p. 104)

A proposed tool to implement these recommendations is the *scenario-based* design (p. 109), where a team of instructional designer uses the information gathered in the context analysis to build a scenario of the instructional event as it might actually happen given the environmental inhibitors and facilitators. The scenario would account for the three context types: orienting, learning, and transfer. It would then become a tool to guide designers as they consider instructional strategies, media, etc.

Summary

A definition and model of context must account for the many layers and interactions of factors that bear on any instructional setting or product. The consideration of the environmental variables, context analysis, and the use of such data are two separate stages in the instructional design process. The purpose of the analysis is to inform design. Ultimately, the goal of that guidance is to improve learning. The analysis process can take place as part of or in addition to the needs assessment, but it is imperative that it is done before decisions about strategies, tools, and assessment strategies are even considered – each relies on a proper understanding of context.

As part of the theoretical rationale for their model, Tessmer and Richey (1997) discuss general systems theory communication theory, and psychological theory. Interestingly, Rogers (1995) calls diffusion a special instance of a general communication model. This relationship between context and innovations becomes all the more clear when one considers the importance of context factors in the design process. Since instructional design is, among other things, a “field of innovation” (Surry & Brennan, 1998), the designer is wise to keep in mind the relationship between environmental analysis, the ID process, and the ensuing communication, adoption, and implementation of the instructional product.

Synthesis

The two educational contexts forming the background of this study could not be more different. On one hand, a young university in Malawi has a faculty and administration which is trying as it might to improve its standing in the country. It seeks to do this by becoming a leader in information technology and offering an expanded number of programs to its learners. However, Mzuzu University operates in Malawi, and as has been shown, it is a country with a number of economic and social issues. These grave problems are both a reflection and a result of the inadequate educational system. Almost a decade since their decision to open primary schooling for all students, the Malawian education system continues to struggle against overcrowding, gender inequalities, lack of basic materials, inefficient teacher training programs, an inconsistent examination system, and the ravages of AIDS. How can programs at Mzuzu (or at any college in Malawi) possibly make in-roads against such problems?

The USAID proposal by Virginia Tech, described in Chapter One, suggests that distance education can help. The grant writers argue that the product of intense creative efforts, and substantial human and technological resources can possibly help Mzuzu position itself to become a true resource for all Malawians seeking to expand their education. Quite simply, however, there is a conflict. How can a web-based distance education program created in the United States for North American learners (ITMA) possibly be suited, either on a technological, pedagogical, or content basis for learners in Malawi? It is true that both audiences are teachers, but one group lives in a part of the world where web-access is approximately 1:6 and the other population lives in an area where it is more like 1:5000 (Butcher, 1998). And this is only the technological divide. The materials themselves do not seem to match the need either. Even if a course on digital video could be put into correspondence form or broadcast over the more readily available medium of radio, how would teachers who have to struggle for chalk and desks possibly benefit from such a course? While they may enjoy learning about digital cameras, the

money to buy one would be better used to build an new school! The literature on the importance of context speaks to this time and again. What must be changed? What guides the change process? What actually changes throughout the process? How does the process of change itself evolve?

These questions are guided in part by previous work done various areas as discussed in the preceding literature review. Research done in the area of context in instructional design (Tessmer & Richey, 1997) provides guidelines not only as to why the consideration of context is important, but how context addresses specific instructional design decisions. In the field of diffusion of innovations, Rogers (1995) and others have examined why and how certain innovations succeed or fail based on their appropriateness for the local environment. The concept of adaptation of innovations is often studied once an innovation is put in place in the field, but few, if any, have looked at the product of a structured, guided adaptation process. Literature about distance education in Africa shows not only its need, but also its use in a number of different countries. Many models and programs exist, but they are either externally created and implemented as is, or locally created at great cost to nations already lacking resources. If distance education programs from developed countries can be adapted openly and through an intense focus on context, it is possible that institutions in the developing world can rely on a relatively small number of people to create a comprehensive distance education program at a fraction of the cost. They would then avoid having to “reinvent the wheel,” and at the same time, develop a program that meets local needs. The guidelines for such change, however, do not exist. While the proposed study is not developmental in nature, the results could possibly help shape a new model or refine an existing one.

But as literature in co-production shows, none of this is easily done when two institutions from differing nations are trying to work together. Of the lessons learned in the past, the one that stands out is how much communication difficulties and clash of institutional cultures deeply affect the collaborative process. As the redesign process takes place, it will be interesting to add more anecdotal evidence to the body of co-production literature that depicts how such differences influence the efforts of the designers and affect the attitudes of all involved.

The need for the project, or ones like it that try to address problems in developing nations, is certainly justifiable for humanitarian purposes if for nothing else. Given the implications the project in the proposed case study has for future, similar projects, a study of the process is also justifiable.

CHAPTER FOUR

Methodology

Following the research rationale and purpose provided in Chapter One and an exploration of theoretical foundations in Chapter Three, this chapter outlines research methods employed for the study. Herein, I present a description of the case selection procedure, data sources, data collection procedures, an explanation of data management, use, and analysis, and an overview of the limitations of the study, including my role as the researcher. To keep the focus of this chapter solely on the methodology, I use the next chapter to give details about specific case attributes.

Research Questions

The original proposal for this study included seven questions, but upon further consideration and recognizing various factors as the case developed, it became clear to me that five of the original seven questions were actually sub-questions related to central focus of the investigation. Therefore, two main questions emerged:

1. Which theoretical considerations influence a team of designers as it adapts distance education courses for the Malawian context?
2. Which practical considerations influence a team of designers as it adapts distance education courses for the Malawian context?

I found that the two questions could then be merged into one:

1. Which practical and theoretical considerations influence a team of designers as it adapts distance education courses for the Malawian context?

The other questions initially proposed revolve around this central question. Listed below, they differ from the original questions only slightly.

a) What does the redesign process imply about planning for implementation?

b) How does the context analysis (needs analysis) affect the instructional redesign of the original ITMA courses?

c) How do the original UPIC project goals change?

d) Which delivery, assessment, and management strategies develop for the redesigned courses?

e) In what ways do inter-institutional issues factor into the adaptation process?

Research Design

The purpose of a case study is to bring a phenomenon to life by examining it through a particular instance. This is done in order to help others understand the multiple meanings and interpretations that accompany any given subject (Gall, Borg, & Gall, 1996). Merriam (1988) offers the following, similar definition: “A qualitative case study is an intensive, holistic description and analysis of a single instance, a phenomenon, or social unit” (p. 21). She outlines four characteristics of a case study: it is particularistic; it is descriptive; it provides a heuristic; and it is inductive (pp. 11-13). Taken together, these characteristics result in a rich, descriptive report focused on a specific situation that leads to a better understanding of the general question being studied by allowing new relationships between variables to be explored and explained.

Considering the various categorizations of case studies, this study can be classified as an *instrumental, descriptive, qualitative* case study. The reason I selected the case study design was due to the nature of object of study and the focus of my questions. The design was chosen after, not before, a formulation of the basic tenets of the original research concept. To define an instrumental, descriptive, qualitative case study, it is best to look at each adjective:

Instrumental: the case study will be used to understand something else (Stake, 1995). As an example, for one major question in the study I proposed, I attempt to explain how environmental (contextual) issues affect instructional designers as they implement a needs assessment survey.

Descriptive: One way that Merriam (1998) classifies case studies is by intent – what the study accomplishes at its end. This study will be descriptive in orientation. Merriam states that such research "presents a detailed account of the phenomenon under study" (p. 38). Specifically, by describing the process of repurposing a distance education program, my goal is to elucidate the feasibility of repurposing web-based courses. The most important thing to remember is that knowledge in a qualitative case study is emergent (Merriam, 1998), with no "right way" that exists to describe a single event or conversation.

Qualitative: Case study research can encompass a number of research methodologies (Gall et al., 1996), to include both qualitative and quantitative approaches. Due to the nature of the case I selected, I had to rely on qualitative methods to collect and analyze data. The types of data collected and the means used to collect them are discussed in the "Data Sources and Collection Procedures" section.

Having now framed the study based on its purpose and method, I will offer some details about aspects of the case.

Aspects of the Case

At the time of the proposal to study this case, many details were not entirely known, but there was a general sense that the focus of the study would be *bounded*. According to Stake (1988), bounded refers to the singularity of focus on a system under natural conditions (p. 256). The study must be concerned with a larger issue (phenomenon) that can be observed within a specific frame, giving it "boundedness" (L. Smith in Stake, 1988). The specific case becomes known as the "unit of analysis" (Merriam, 1988, p. 44). The boundaries for the case were quite clearly defined by a number of factors: time, availability of personnel, and the context within which the events of the study took place. One factor, namely my own deep involvement with many aspects of the project beyond the element of redesign, had the potential to interfere with case boundaries, a subject I address in a subsequent section of this chapter.

Time line

The original goal of the case study was to keep data collection efforts parallel with the actual events leading to course redesign. This was achieved, but one semester later than originally proposed. Circumstances beyond anyone's control led to the delay of a report that was to guide redesign efforts. Whereas the proposed study was to take place from mid-October 2002 and go to February 2003, the actual study began in mid-January 2003. Fortunately, clear demarcations of time framed the case. Redesign efforts would take place within a class that included the Malawian students, IT professors, and IT doctoral students. The class started on Jan. 13, 2003 and ended on May 5, 2003 (see Appendix A for class activities). This arrangement proved very useful to me as the main effort I wanted to examine was certain to take place within a certain period of time; this was not at all clear during the proposal stage of the study.

Availability of personnel

Of the many people associated with the study, the case was dependent on the efforts of five people in particular, the Malawian instructional technology master's students. It was their work, after all, that would help produce the redesigned courses. Given the fact that the end of their studies would come in May 2003 upon their graduation, their availability would be restricted once departed.

Context of the study

The redesign efforts occurred within the context of a class titled "Instructional Technology Clinic," which is described in more detail in the next chapter. The class setting, however, is important in terms of "boundedness" of the case in that its entire goal was to focus on the redesign of courses for use in Malawi. This goal was set by the needs of the USAID/UPIC project (also described in Chapter 5) and refined by the class members.

Data Management

Defined by Miles and Huberman (1994), data management is "the operations needed for a systematic, coherent process of data collection, storage, and retrieval" (p. 428). The three processes associated with data management – reduction, display, and verification – take place before, during, and after the research process (p. 445). Similarly, Gall, Borg and Gall note, "Data collection is emergent in case study research" (1996, p. 559). However, case study research is not a matter of making things up as one goes along, as asserted by Simon (1969). Stake writes, "…good case studies depend on discipline. One needs to think through, in advance, some of what may come to pass" (Stake, 1995, p. 15). An example of forecasting in this case study related to the type of projects students were to create and the means by which they would do so (working in peer groups).

The management of the majority of data was organized through the NVIVO software by QSR as nearly all data collected were composed or available in electronic form. I used NVIVO essentially as an information warehouse. Data not available electronically were stored in three-ring binders, but information from that data germane to the case was transcribed so I could examine it on a computer using NVIVO.

Data Sources and Collection

The three sources of data in a case study are interviews, observations, and documents (Merriam, 1998). A data collection matrix can be found in Appendix B.

Interviews. I used formal, semi-structured and informal, unstructured interviews throughout the study, developing questions based on issues that arose from the case. The interviews took place at various intervals during the case study. A list of participants is found in Appendix C. I interviewed some participants only once, while others are were interviewed a few times based on my perception of their role in the process. Nearly all formal interviews were recorded and at times where it was not possible to record (limited to one or two times), I took detailed notes in a composition book and typed up those notes shortly afterwards. I transcribed all interviews myself, using the Dragon Naturally Speaking (Preferred, v. 6.0) dictation software. Occasionally, interviews were less formal and took the form of conversations after a class or in a car during a trip. The comments made in these informal settings were written down as soon as I had the opportunity to do so (see Appendix D for an excerpted interview).

Observations. Merriam (1988) asserts that participant observation is a "major means" of data collection in case studies (p. 102). Field notes resulting from observations helped to provide, to use Stake's (1995) words, an "incontestable description," (p. 62), or one that gave as clear a picture as possible of a setting, activity, or event. My observations during the case study

were limited to the ten class meetings and some meetings of the three design groups. I had asked for the groups to let me know when they would be meeting, but I received few notices to this end. In one group, two members shared an apartment and sometimes met when they were at home. In another group, where there was a high degree of communication problems, even getting all three of their members together at the same time seemed problematic. And, because I was absent with the Malawian group during much of March 2003 at various education conferences, group meetings during that month were very limited. The actual meeting arrangement varied from my original concept. I was under the impression that much more work and conversation about design would be happening in the IT Clinic itself. My research proposal reflected this, as I said at the time, “For this case study, most observations are most likely to take place in an office on campus that has been specifically designated for project work.” While I had set up an office for the purpose of group meetings, only one group managed to meet there from time to time. Students worked primarily on their own and would meet together when it was convenient for the group to discuss progress. These meetings are chronicled in the journals of the IT Clinic members. Observation periods in IT Clinic class provided insight into the instructor-student interaction and also inter-team communication. In the limited number of times that I was able to attend extra-class design meetings, I observed team interaction as they discussed editorial or design decisions (see Appendix E for an observation session example).

Documents. Alternatively referred to as artifacts or materials, *documents* represent any form of written communication (Merriam, 1988). The primary source of data for this study arises from the various documents collected. Examples of these documents (most of which are in electronic form) include IT Clinic assignments, student design journals, the course materials before and after the redesign process, e-mail messages between members, and an array of background documents concerning the project (see Appendix F for an excerpt from a student journal).

Access, Protections and Confidentiality

My access to the activities and personnel involved in the case results from my direct interaction with the USAID/UPIC project. Although I am not paid as a member of the project staff, I became involved with the project very shortly after the implementation phase began. Additionally, I am friends with the Malawian students, a student of some of the participating professors, and a graduate colleague of others who participated. This relationship made the assurance of confidentiality and protection of identity even more urgent to me.

In order to attain approval for the study at the university level, it had to pass through the Institutional Review Board (IRB). Strict guidelines concerning the inclusion of human subjects, even for purposes of observation and interviewing, have been established. As part of the IRB documentation, I detailed the exact role of the participants and how the data collected was to be protected (informed consent). I established three categories of participants based on the type of data I anticipated gathering from them: students, faculty, and tertiary participants. The first group was assured that their participation in the study, or unwillingness to do so, would have no ramification on their grades. Tertiary participants compose a group of people who were not observed or directly part of the redesign efforts. Details about how a participant could withdraw from the study were also required. The template of the IRB forms is found in Appendix G.

Another means of ensuring accurate portrayal of events, comments, etc., is through member checking and audit trails (Lincoln & Guba, 1985). Audit trails show a clear progression of data sources, collection, and analysis. Member-checking uses participants to review reports and give feedback on them. In what I consider to be an advantage in regard to credibility, two of the five professors reviewing this document were also actively involved in the redesign process. My own constant interaction with them gives me a reasonable assurance that my observations

are credible. To ensure protection of personal identities, I use pseudonyms for the participants as I describe any person's actions or comments.

Data Analysis and Application

Data Analysis

The main thrust of the analysis has been to create a lucid description of the various elements in the case. Merriam's (1998) notion is that a case study, being an "intensive, holistic description of a single, bounded unit," has as its analytical priority the imperative to "convey an understanding of the case" (p. 193). For an instrumental study like this one, where the objective is to "understand the phenomenon or relationships in it as much as possible" (Stake, 1995, p. 77), Stake advises that analysis targets the relationships identified in the questions. The primary relationship exists between the designers' negotiation of contextual elements both in the United States and Malawi and the ultimate impact of those factors on the redesign of the ITMA courses.

Stake (1995) also writes that the analysis process is a search for both correspondence and patterns. This can be accomplished through what is known as triangulation, where multiple sources of data converge to create a holistic, unified picture. Citing Denzin (1984), Stake describes four triangulation protocols: data source triangulation, investigator triangulation, theory triangulation, and methodological triangulation. The idea is that the researcher will investigate multiple sources of evidence through multiple means before drawing conclusions (Miles & Huberman, 1994). During my study, two methods took precedence. Data sources were triangulated by means of comparing information from interviews, documents, and observations. Investigator triangulation was made possible in that experienced researchers were involved in the study and served to either confirm or counter various observations I made or conclusions I had drawn. Accounting for theory triangulation is difficult. As a descriptive case study, the result of this investigation does work to build theory nor do the results "confirm" theory. Finally, methodological triangulation was not possible because no other methods, such as survey research or experiment research, were employed to measure aspects of the case; it would have been illogical to use them.

In order to familiarize myself with the data and create relevant coding categories, I read through the transcripts of the interviews, field notes, project documents, and other data sources during and after collection. Doing so allowed me to anticipate possible areas to investigate, but it also helped me set aside those aspects that, though interesting, distracted from the main thrust of the study.

Trustworthiness (Internal Validity)

The central issue of validity and reliability in qualitative research essentially concerns trustworthiness (Merriam, 1998). It is unrealistic to expect any case study to cover everything in a given case – one must choose which issue to report and which not to (Yin, 1998). Janesick (1994) observes, "validity in qualitative research has to do with description and explanation, and whether or not a given explanation fits a given description" (p. 211). As an analogy, one might think of a photograph. Upon seeing a photo, a person knows that it is but a singular, specific representation of a large scene. The photo shows the scene and, at the same time, the preference of the photographer. The fact that a case study is also "cropped" does not make it less valid. The trustworthiness of my case study arises both from the fact that my data collection and analysis follow suggested best practices in qualitative research. The fact that the study itself is not a meandering tour of multiple events and people, but a small, focused snapshot, adds to its internal validity. The quality of having a narrow (as opposed to broad or wide-ranging) focus is problematic to some and the question of generalizability must be addressed.

Generalizability (External Validity)

A common criticism of case study research is that its focus is too narrow – that the findings cannot be generalized as they might be in a quantitative study. Like Simon (1969), some critics believe "descriptive research does not create laws and conclusions that apply beyond the subject matter described"(p. 53). The question at the heart of the matter is how to transfer results to situation more broad than the singular issue of the case? But Simon's comments miss the point. Stake (1988) remarks, "In the case study, there may be or may not be an ultimate interest in the generalizable. For the time being, the search is for an understanding of the particular case, in its idiosyncrasy, in its complexity" (p. 256). The purpose is not to create laws for the world at-large, but to understand the thing at hand. Yin (1998) agrees, noting that generalizations from case studies is not to be understood in the statistical sense, where one moves from the narrow to the broad. He adds that it generalizing is instead a matter of analysis, where a case (or cases) is used "to illustrate, represent, or generalize a theory" (p. 239).

Cronbach (1975) and Erickson (1986) (both cited in Merriam, 1988), completely reject the notion that qualitative studies should ever be used for generalizations. Instead, Cronbach's *working hypothesis* considers the context within which the researcher works. Erickson is a proponent of *concrete universals*, which also arise from the application of theory in a particular context.

The focus of generalizations, at least for Stake (1995) and Pitman (1992) becomes less the obligation of the researcher and instead towards the reader; "In qualitative research, it is primarily the readers who determine whether the study or evaluation generalizes to their situations" (Pitman & Maxwell, 1992, p. 748). Stake calls his notion "naturalistic generalization." In his view, the reader brings to the text various experiences that when met with a properly descriptive case, become further broadened or refined – which is in fact the process of generalization.

This particular case study is unique. Very few, if any, instructional technology programs in the United States are currently training foreign nationals to re-design institutionally-based distance education programs. Therefore, generalizing the lessons of the study may prove impossible if the reader looks for exact similarities in other programs. The ability to interpret the difference(s) the study can make in other situations lies instead with the reader him or herself (Pitman & Maxwell, 1992, p. 748). Arising from this study is an identification of issues concerning the role of context in instructional design. The findings can be of use to the reader if he or she brings similar experiences to the text rather than wanting to draw general recommendations out of it. Given the emphasis placed on case description as opposed to interpretation, movement away from generalization and towards understanding is undoubtedly more profitable.

Limitations and Assumptions

Yin (1998) observes that a distinct advantage of the case study is "its ability to deal with contextual conditions" (p. 237). These same contextual conditions, in this study, imposed certain limitations. Some limitations may appear more prohibitive than others. Take for example the issue of language. The process and product of the instructional re-design was done in English, the second language of the Malawian participants and also the second language of two of the participants, whose first language is Chinese. The advantage of the Malawians is that they come from a nation that has English as its official language and all of their schooling, starting in primary school, has been in English. Because of my familiarity with their written skills and my daily communication with them (orally), I am well aware that their English skill is fluent; it did not seem to impede their work. Based on our conversations about hard work in other classes, their complaint was never about the language aspect, but instead on the work load or on the time it

took to do research, etc. There were, however, problems expressing some terms in their own language, so they reverted to English. When I would listen to their conversations, talk about technical things always included a lot of English words even if most of the conversation was in their native language. I asked one participant why they would use English in such instances and he told me that they either did not have a word for that thing in English or it was just easier to say using English as that is how they learned it (personal communication, H. Mfune, 2003).

A second limitation for the study is the fact that I have no first hand knowledge of the Malawian context. While it was my intention to travel to Malawi toward the end of data collection, it did not happen. Some may take issue with the fact that I do not have a first-hand account of the environment. There is little question, in my mind, that a trip to Malawi would help me contextualize certain elements. But I would argue that my ability to triangulate ethnographic data would be highly suspect given what would likely be a very short trip. The information would merely serve as background and not really aid in analysis. Perhaps the most important point to remember is that this study is not an ethnographic record of the participants or context. While a qualitative case study may use ethnographic methods, it does not have the same goals of an ethnography (Merriam, 1988). This case study is not about Malawi per se. While the Malawian context is important, what is central is the redesigned courses as developed *by* Malawians for use in their own context. So the real focus, as can be surmised from the research questions, is actually on instructional design given a set of contextual factors.

Three major assumptions were made in the case. First, I assumed that the Malawian participants actually had a deep contextual understanding of their own context and could apply it. Second, I assumed that their education in the IT program had adequately prepared them to redesign distance education courses. Finally, I assumed that interaction among and between the groups of students engaged in redesign would be relatively problem-free and occur at regular intervals.

In regard to the first assumption, there is some evidence that suggests that the Malawian designers either did not recognize limitations imposed by their context or chose to ignore it. For example, all of the courses they took were not redesigned for their context yet they successfully completed the course work. It is possible that they did not see difficulties in the same way in their fourth semester of graduate work as they may have in their first semester. Some disagreements among the course evaluators in regard to content also suggest discrepancies in the application of contextual knowledge. As for the second assumption, the students involved in redesign did in fact call upon their previous learning experiences to redesign instruction. Their challenges, as is reported, had less to do with lack of design experience and more to do with certain inhibitions in regard to content they did not originally create and a lack of a clear understanding about the role of distance education at the Malawian university. Finally, the groups all operated at different levels of interaction. As alluded to earlier, one group in particular experienced many communication problems. The groups did not really interact between each other, but this is in itself a mirror of what happened when the original courses were designed. This aspect of the design project created a separate context and it is interesting and I examine it as part of the “practical” considerations influencing design.

Researcher Role and Biases

The “ongoing interpretive role” of a researcher is also an especially distinct feature in a qualitative case study (Stake, 1995, p. 43) and he outlines five roles for the researcher: teacher, advocate, evaluator, biographer, and interpreter. At the start of the study, I was not sure if my role would emphasize one area or if I would indeed act all six parts; it turns out that my role varied just as Stake suggests. On one hand, acting as a teacher, at least in the administrative role of teacher, I was reminding students when journals were due or submitting an article that

they might to read. In the role of a biographer, I tried to get a clearer picture of their background and their future plans. As evaluator, I took a critical look at their efforts and how the IT Clinic progressed as a class.

Merriam's (1998) classifications of researcher roles defines me as an observer-participant (p. 101). My primary role was to observe and report what it is I found. The participants were aware of this fact. But during class times and whenever I talked with the students or professors in the study, I found that I would often participate more than observe. Because I was quite conscientious of the potential influence I might have, I made efforts to not say certain things or ask certain questions, aware that doing so might influence design decisions in a way that would not have developed naturally. I did not want my opinions about redesign to interfere with what the individual groups would develop on their own.

Researcher Biases

Crandall (1978) states, "Biases that cannot be controlled should be discussed in the written report" (cited in Merriam, 1998, p. 216). One accommodation I attempted to create is what Peshkin refers to as a "subjectivity audit" (cited in Gall et al., 1996). The audit entailed taking notes on instances that gave rise to strong personal feelings. This method, based on the simple principle of being candid, was helpful to me as I recorded how my descriptions and interpretations of events surrounding the case.

A specific bias of which I have always been aware is my belief in the transformative power of instructional design. I believe that good instructional design can and does optimize learning environments. I am also biased about the instructional technology program at Virginia Tech. I have been a part of the graduate program since 1997 and I am convinced that its students, alumni, and professors contribute to a high quality program. The desire to do quality research stems from a deep sense of wanting to be a good reflection of the people who work in or who have graduated from the program.

I am biased in the sense that I believe my Malawian colleagues have a great deal of talent, potential, and enthusiasm, and given the right tools and freedom to operate, they could change the role of distance education in their country. I must say, however, that I do not think of the Malawian participants as peers merely in the collegial sense. All of them are my friends. When they first arrived to the United States, I personally escorted them around campus and town, helping each of them settle in. The Malawians and I have traveled across the U.S. together to various conferences. I have shared jokes, tears, frustrations, and anxieties with them. I feel a bit like they are brothers and sisters. When one of the Malawian students passed away in an auto accident, I was among the first to find out and had to share the unfortunate news with others. His memorial service was a sobering reminder that any project like this goes far, far beyond research and project goals and is centered on the human element. And it is due to this human element that I have tried to carry out this research in a responsible, organized manner. My goal has not been to portray my colleagues' actions in either a negative or positive light, but to reflect critically on the elements of the case.

CHAPTER FIVE

Case Description

To give the reader a more complete picture of the elements of the case, contextual elements surrounding or intertwined with the Malawian context must be provided. Therefore, this chapter describes a number of aspects that furnish important details in regard to the study. Starting with an overview of the project funded by the United States Agency for International Development, this chapter also briefly describes the two institutions the grant brought together. Readers will find an overview of the Instructional Technology Master's on-line master's degree program and the setting in which the redesign efforts took place, a course titled Instructional Technology Clinic. The course is described in some detail along with a general description of the participants who took part in the IT Clinic experience, all of whom participated in this study to varying degrees.

The USAID Grant

In its effort to provide the country of Malawi with quality basic education programs, the United States Agency for International Development [USAID/Malawi] sponsors a program that links U.S.-based institutions of higher education with universities and educational organizations and institutions in Malawi. The program, which is known as UPIC, or University Partners for Institutional Capacity, "is a direct response to Malawi's critical need to establish high quality primary school teacher training and to build and maintain capacity for productive education analysis and planning" (Ministry of Education Division of Planning, Task Force for Professional Enhancement and Training, & GABLE PPC [MEDP], 1999, p. 1). The "critical need," which is detailed in Chapter Three with the description of the Malawian educational system, arises out of that country's overwhelmed primary, secondary, and tertiary level schools. The inadequate facilities and equipment notwithstanding, there is quite simply a lack of properly trained personnel. Thousands more teachers must be trained, but Malawi's colleges and teacher training institutions lack the capacity to do this. The key aspect of any successful innovation developed to improve the educational system is sustainability (Rogers, 1995). The focus of the funding program, therefore, is on the training and education of people who can then train others and develop new ideas. Development of the human resources and institutional capacity for maintaining the human resources is imperative, for without them, "there can be no hope for sustaining the educational reform efforts that are taking place in Malawi today" (MEDP,1999, p. 2).

The initial concept for the UPIC project included three related, but separate projects: the Primary School Teacher Trainer Project, the Advanced Degree Project, and the Library Link Project (MEDP,1999, p. 2). Once the UPIC project proposal found funding through USAID/Malawi, the first two projects remained essentially the same, but the Library Link project became known as the Information Communications and Technology (ICET) Activity (USAID/Malawi, n.d.). Designed to link Malawi's institutions of higher education via electronic communication technologies to libraries at U.S. universities, the goal of the Library Link project was to provide Malawian educational professionals access to professional literature, allow them to communicate with other educators around the world, and provide global instruction through tele-conferencing (MEDP,1999, p. 7). The goals of the ICET are nearly the same as those found in the Library Link document, but the focus turns away from hardware and towards training of people who would be establishing the links. Accordingly, USAID's Request for Proposal (RFP) stated that the emphasis would be on building human capacity. As the literature has shown, so many projects fail due to a lack of properly trained people who are native to a region who can then sustain programs or tools. The RFP stated the U.S. partner institution would train a cadre

of education technology experts in order to “facilitate access by Malawi professionals throughout the country to the educational resources provided through the internet, tele-conferencing and video-programs which will be established at Mzuzu University” (USAID/Malawi, n.d.). Instructional technology professors at Virginia Polytechnic Institute and State University [Virginia Tech], along with professors in the university’s Department of Teaching and Learning [T & L] and Department of Educational Leadership and Policy Studies, submitted proposals to become the U.S partner institution for all three projects. Two proposals were awarded to Virginia Tech, the ICET project, which would be run by the university’s instructional technology faculty, and the Teacher Education project, to be directed by professors in T & L. The Advanced Degree project (the administration and educational research component) was awarded to the University of Massachusetts, Amherst. Because the case study only examines the ICET activity component, details about Virginia Tech’s efforts in the Primary School Teacher Training program are not described in this document.

The overarching goal of the ICET activity proposal, as found in the original proposal to USAID/Malawi (Burton, Lockee, & Moore, 2001), is

> To prepare a group of Malawian educators to serve as instructional technology specialists with the skills not only to design and implement on-line programming regarding IT [instructional technology], but also to serve as technology trainers for other Malawian teachers. Ultimately it is desirable for Mzuzu [University] to take complete responsibility for managing a sustainable effort for training teachers in the use of technology in education and possibly for administering degree work or certification work at a distance (no page number).

The project’s original Memorandum of Understanding, a document that outlines the responsibilities of both Mzuzu and Virginia Tech, can be found in Appendix H. As of the writing of this document, the goal of preparing Malawians as instructional designers has nearly been completed, with four of five Malawian graduate students completing their master’s degree in instructional technology in May 2003. A fifth student will finish in December 2003. Sadly, a sixth student who was also due to finish in May died from injuries sustained in an automobile accident shortly before he was due to return to Virginia Tech to finish his studies.

The second phase of the USAID/UPIC project and the focus of this case study was the re-design of an existing distance-based master’s degree program. The degree program, known as ITMA (Instructional Technology Master’s degree), is described in a subsequent portion of this chapter. Three of the courses have been redesigned and the recently graduated Malawian students have returned to Mzuzu University to begin piloting the course materials and continue formative evaluation.

Following the training of the IT cadre for Mzuzu, the original goal of the project was to establish a web-based master’s degree program at Mzuzu that would serve up to 80 students. While the spirit of this goal has survived, the specific implementation has changed based on the reported needs assessment results, described in Chapter Six. One question this case study examination sought to answer was “How do project goals change during the adaptation process?” Rather than explain the differences here, the changes are highlighted in the chapter on case study findings.

The Two Universities

Mzuzu University

Mzuzu, the capital city of Malawi’s Northern Region, a city south of the rolling hills of the Nyika National Park and west of the expansive Lake Malawi, is home to Mzuzu University, founded in 1998. A teacher training college until 1994 (Mzuzu TTC), the university was

established shortly after the country's first democratically elected leader mandated that broader educational opportunities be opened for Malawians. Until its inception, the University of Malawi's five constituent colleges were the only institutions in Malawi to offer a four-year degree. Mzuzu is administratively distinct from the University of Malawi system, but like it, it is a public, government-funded institution whose chancellor is also the country's president. Mzuzu's mission is, "to provide high quality education, training, research, and complementary services to meet the technological, social, and economic needs of individuals and communities in Malawi" (Ngwire & Kanjeza, 2000).

Mzuzu University's primary mission is to educate secondary teachers, but it offers bachelor's degrees in other areas, including health promotion and natural resource management. The university is seeking to add a Faculty of Information Sciences soon. Additionally, Mzuzu hosts a Center for Continuing Education, which has the primary mission of providing lifelong educational opportunities, particularly in the area of health promotion and energy utilization. Close to 40 faculty members are employed at Mzuzu, most of whom have a background in secondary education; the current student enrollment is approximately 400 undergraduate students, giving it a teacher-student ratio of 1:10. Because national education standards in Malawi mandate that graduate-level courses are taught only by those holding a doctoral degree, no graduate program is offered at this time. There are serious plans to introduce graduate studies soon, however. Distance education initiatives and policies, just now being formed by its own personnel, are being put into practice to help alleviate the problems associated with the shortage of qualified teachers in secondary schools across the country.

The university is situated on a relatively small campus, although 6,000 hectares (14,000 acres) were donated to the university in 2001 by the surrounding community. The university hopes to expand its campus at the new location, while keeping the Mzuzu site for its Faculty of Education and future Distance Education Centre (personal communication, H. Mfune, 2003). Due to the efforts of key personnel at Mzuzu and funding by outside agencies, the university has been able to build a small network of computer resources. Power outages are relatively frequent in certain seasons due to problems beyond the university's control (instability in the national power grid). Periods of insufficient funding have contributed to tenuous status of the technology resources. Computing resources nevertheless continue to grow in the library, as well as in individual departments. Communication capabilities include phone, fax, a leased Internet line (provided through the Leland Initiative), and a dial-up connection to one of Malawi's Internet Service Providers. The technology resources at Mzuzu are still small and are in need of more funding so they can be upgraded, but given what has grown in a relatively short period of time, and based on conversations with Mzuzu's top officials, it is certain that the willingness to embrace and use technologies to their full administrative and educational potential is strong.

Yet in its fifth year, there is little doubt that Mzuzu will be part of the national effort to meet the goals outlined in the National Science and Technology Policy (Pouris, Guta, & Mwanza, 1999), which states, "information technology is a key element in the process of assessing, selecting, and diffusing technologies and policies; activities which are critical in developing countries such as Malawi where proper matching of limited capabilities and the many needs for socio-economic development is necessary" (p. 21). Mzuzu University is gradually building programs that will secure its future in the development of the Malawi.

Virginia Tech

Virginia Polytechnic Institute and State University, known most commonly as Virginia Tech, is a large research university located in the southwestern area of the state near the Blue Ridge Mountains. Virginia Tech was founded in 1872 as a land-grant college. Its 2,600 acre campus is home to nearly 27,000 students, 4,300 of whom are graduate or professional

students (Office of University Relations, 2001). Almost 1,500 international students are part of the student body. As many students as this may seem, the State Council of Higher Education for Virginia [SCHEV] indicates that in Virginia alone there are 74 tertiary institutions (4-year, 2-year, public, private, non-profit only), with a total enrollment of more than 200,000 students (SCHEV, 2002).

As a public institution, Virginia Tech's mission is to serve the Commonwealth of Virginia, the nation, and the world communities. According to its formal mission statement, it attempts to do this through the "discovery and dissemination of new knowledge" and attempts to create, convey, and apply knowledge "to expand personal growth and opportunity, advance social and community development, foster economic competitiveness, and improve the quality of life." It does this by fulfilling its tripartite mission of teaching, research and outreach (Office of University Relations, 2001).

Virginia Tech employs more than 1,200 faculty members and an even greater number of non-teaching faculty and support staff members. Much more than a "polytechnic" as defined in the British system (only the name is similar), it offers a vast range of majors, many not all related to a technical or scientific field, although it is probably best known for its engineering and information technology disciplines. Its Graduate School grants master's degrees in 63 fields and doctoral degrees in 51. The Blacksburg campus is also home to the Virginia-Maryland College of Veterinary Sciences. Currently, there are eight colleges that make up the university, each headed by a dean and supported by a centralized college administrative staff. The university is accredited by the Southern Association of Colleges and Schools.

Funding for Virginia Tech comes from a variety of sources. The majority of funding for the operation of the school comes from the state's budget, but students often receive federal aid in the way of grants or loans to help pay for their education (tuition for undergraduates is approximately US$3,000 per year). Research funding is supported by grants from outside agencies, both governmental and corporate. Annual sponsored research funds for Virginia Tech amount to US$170 million each year, placing it among the top 50 of overall research institutions and 12th among universities like it without human medical facilities (Office of University Relations, 2001). Another source of funds for capital projects and annual expenditures comes from philanthropy; Virginia Tech has a broad base of alumni donors who support the school on a regular basis through their gifts. Finally, because of the university's nationally recognized athletic teams, specifically its (American) football team, it receives money from participation in widely broadcast games. Its total operating budget in 2000-2001 was US$627 million, although recent budget cuts by the state have decreased this amount by 10% or more. No matter the source of funds, strict accounting measures and federal and state regulations help ensure that no misappropriation of funds occurs. Each unit, even down to the individual researcher at Virginia Tech, funding must follow accountability guidelines that are reported regularly. State regulations govern faculty salary and an entire division at the university is devoted to intellectual property considerations and determining conflict-of-interest issues.

The university extends the influence of its programs beyond the borders of its campus in two ways: outreach (extension) and distance education. Extension office personnel have always been locally integrated in Virginia. There are 107 extension offices throughout the state. The extension officers provide horticulture and husbandry advice, all of which is based on research, to farmers across the state. They also provide educational opportunities to youth and adults in a variety of areas, most of which are tied to agricultural endeavours. Another area of extension goes beyond the borders of Virginia and the United States . The Office of International Research, Education, and Development [OIRED] "manages projects in more than 40 countries throughout Asia, Africa, Latin America, the Caribbean, Russia, and Eastern Europe" (OIRED, 2003). OIRED's manages, oversees or interacts with projects totaling US$31 million. These

projects, most of which are funded by USAID, include natural resource management, information technology, agriculture, environmental management, capacity-building, greenhouse reduction, biodiversity and biotechnology (OIRED, 2003).

The Institute for Distance and Distributed Learning [IDDL] at Virginia Tech, organized in 1997, is under the purview of the Office of the Provost with the mission of "providing provide leadership, coordination, management and support to Virginia Tech's distance learning activities" (IDDL, 2003). IDDL reports that 85% of the university's departments are involved in distance learning, offering more than 400 courses for credit and 24 degree, certificate or licensure programs. As part of its mission, IDDL staff help create and revise university policy associated with distance learning. For example, the university did not accept payment of tuition with a credit card by any person who was trying to enroll for classes. This policy was changed to accommodate off-campus learners as payment by check or money order took a much longer time and it could not be immediately verified (M. Raby, personal communication, 2000). With a staff of professional instructional designers, assessment experts, and technology specialists, IDDL communicates with faculty members across disciplines to create distance-delivered courses that employ a variety of technologies. By working with the Faculty Development Initiative on campus, a program that trains professors how to use and integrate educational technologies, IDDL teaches faculty about distance teaching and learning, empowering them to make their own decisions in regard to distance course offerings.

As Virginia Tech moves forward to develop innovative programs like bioinformatics and bioengineering, a forging of new partnerships will continue to advance the university's vision to become a leader in the marketplace of ideas. Given the diversity of its programs and its mission to serve, Virginia Tech will continue to contribute to national and international education and research efforts.

The ITMA program

The Instructional Technology Master's degree program [ITMA] is an on-line (web-based) version of an existing, on-campus master's degree in instructional technology offered at Virginia Tech. Created in 1997 by a group of instructional technology [IT] professors, and implemented in 1998, ITMA permits educators across the nation to enroll in a graduate program to which they might not otherwise have access due to their remote location. The description from the program's introductory page on the Web reads:

> [ITMA] is specifically designed to meet the needs of practicing professional educators as they confront the increasingly important role technology is playing within local, state, and national educational systems. Individual professional experiences are highly valued and will form the basis for most of the projects developed throughout the program. Because this is a distance program, all courses are offered electronically via the World Wide Web. (*ITMA Web Site,* 2001)

The first two iterations of ITMA (1998-2001) were organized around a cohort model, where students entering the program would and finish at the same time. The first group of students, a cohort of about 65 educators from around the state, graduated in May 2001. Subsequent iterations have involved numerous changes to include the elimination of cohorts, elimination of face-to-face meetings (although these were quite limited in number even in the first year), an opening of enrollment periods, and the removal of the requirement that all students had to have the same number of credit hours as their peers (Saenz, 2002). The current enrollment in ITMA stands at approximately 150 students, but there have been discussions about increasing the scale of the program to accommodate many more learners (Snider, Perkins, Holmes, & Lockee, 2003).

Students are required to complete 30 hours of graduate-level courses; they usually do so within a three-year period. They can do this by selecting from about a dozen courses developed by the ITMA faculty and design team. Examples of course titles include: Principles of Instructional Design; Education and the Web; Teaching and Learning with Tele-communications Technology; Digital Video Production; Educational Psychology; and Multimedia Authoring. Assessment of the students' work is largely through written assignments and projects, but some courses also use web-based quizzes to assure continual progress. A final, summative assessment concludes each student's program, when his or her electronic portfolio is reviewed by peers and then graded by faculty members. The goal is for each student to develop instructional technology competencies established by the Association for Educational Communications and Technology (AECT) … [and to develop] an electronic portfolio designed to showcase the technology-related standards identified by the International Society for Technology in Education (ISTE) (*ITMA Web Site,* 2001). The ISTE standards are the same ones promoted by National Council for Accreditation of Teacher Education (NCATE), the U.S.-based, nationally recognized teacher certification organization.

The limitations to the ITMA system, which are the same limitations faced by any distance education courses offered by the university, are due almost entirely to university policy. Graduate admission for students in either the on-campus or off-campus program is conducted through the College of Graduate Studies and then at the departmental level in individual colleges. Unlike an "open" distance system, students can only enroll in classes at the beginning of the fall, spring, or summer semesters. Except for one or two foundational courses, students can take classes in any order they choose (Principles of Instructional Design, for instance, is one such course and must be taken early on). Internal policies within the ITMA program now allow a student to complete selected courses outside the semester system with no penalty. For some courses, students have the option to finish work later than the end of the semester. This flexibility has allowed ITMA to maintain a relatively stable enrollment, diminishing drop-outs substantially. Should a student choose not to finish a course during the semester in which he or she first enrolled in the class, he or she will receive an "incomplete" (not failing) mark. If the student finishes the course at a later time, "change of grade" documents must be completed by the designated instructor and the appropriate grade is given.

The administration of the ITMA program is conducted by one professor and a group of approximately 5-10 instructional technology doctoral students working as graduate assistants. Some of the graduate students act as graders, others help design or redesign existing courses, and one student is designated as program manager, taking care of day-to-day administrative tasks and coordinating the efforts of graders and designers. In some cases, the professor who created a particular course or is listed as the "instructor of record" grades student assignments, but the majority of grading for the courses is completed by graduate students employed to do so. Another model, implemented for the second iteration of ITMA, used a few of the ITMA graduates to grade coursework. Perhaps the key element of allowing multiple people to provide different aspects of course management in the program is due to the web-based, data driven management system.

Instructional management is largely dependent on a complex database-dependent program first implemented in the Spring 2000 semester. The program relies on commercially made products such as Macromedia's *Cold Fusion* and Microsoft *Access*, but was conceptualized and programmed by Virginia Tech faculty and graduate students. Proprietary discussions about program are on-going. The management interface allows students, instructors, graders, and technical support personnel to submit, access, and retrieve assignment records on-demand through a web-based interface. This means that assignments, once submitted in an electronic format, can be downloaded by the grader, marked with feedback, and

returned to the student in a very short time, potentially less than one hour. A university-wide administrative program known as Banner, a product developed by the SCT corporation, provides details about a student's contact information, academic schedule, payment options, course registration tools, and numerous other functions. The Banner program is extraordinarily comprehensive in scope and function, costing the university more than $32 million since 1997 to install, implement, and maintain (personal communication, R. Pelt, August 2003). The various functions of Banner are used on a daily basis by faculty, staff, administrators, and students across the university on all its campuses and outreach centers.

The outlay of money for the design, establishment, and administration of ITMA during a four year period (1997-2000), as reported by D.M. Moore, Lockee and Burton (2001), totaled close to US$318,000. Some of the funds were the result of grants, but other monies came from the Department of Teaching & Learning, the College of Human Resources and Education, or IDDL. As of summer 2000, expenses for ITMA averaged US$60,000 per year. The expenses include graduate student support, travel costs, and operational expenses. The total revenue generated by 150 students who pay approximately $830 for each three credit hour sequence is US$124,500.

Finally, another important aspect of the ITMA program is that it does not exist in a vacuum. Although it is developed and maintained by instructional technology faculty and graduate students, ITMA is but one of many distance learning initiatives at Virginia Tech. The ITMA program continues to rely on support personnel in the Institute for Distance and Distribute Learning (described previously) to resolve various student-related issues. The positive interchange between the instructional technology and IDDL faculties in each area has contributed significantly to the success of the on-line degree programs not only in the Department of Teaching and Learning, but in numerous other departments as well.

Instructional Technology Clinic

The following section provides a general description of the Instructional Technology Clinic, a course that many study participants and the researcher took part in during the Spring 2003 semester. The overview provided here is to give the reader basic information about the clinic. Specific issues related to the clinic, such as an analysis of assignments, class-related issues impacting the final re-design product, and student feedback about the clinic experience will be discussed in more detail in Chapter Six. The researcher's role in the clinic is outlined in Chapter Four.

The on-campus instructional technology graduate program area offers the IT Clinic at least once per year, generally in the spring. The general goal of the clinic is to provide students with an opportunity to interact in a realistic design environment as they produce instructional products. As such, there is an emphasis on meeting a client's needs. The class setting allows students to develop skills in the areas of design, development, and project management. There is also an emphasis on collaboration and communication among project team members. The professor(s) who teach the course more often act as facilitator than instructor. Except for taking care of administrative issues and occasionally providing guided instruction, the professor(s) allow students make decisions among themselves in order to meet project goals. The project in the IT Clinic itself is selected, in most cases, from a number of possible projects or, at the very least, debated in regard to the nature of the final product. In the past, students in the clinic have produced web-based courses, digital video projects, and undertaken scalability analyses of the ITMA program.

The Spring 2003 IT Clinic was a mandatory course in the graduate study plan of the five Malawian students. At the end of the Fall 2002 semester as students began to plan for the spring, selected IT graduate students were invited join the group. Four students signed up, two

students from the U.S. and two Chinese students in the IT doctoral program. Besides the nine students (average enrollment for the IT Clinic), three professors guided the clinic. Towards the end of the semester, six additional students from Malawi, all of whom are doctoral students in teacher education, conducted formative evaluation on the instructional products; they were not involved in the week-to-week development of the materials, however. As was indicated in Chapter Four, each participant in the class, professors included, were formal participants in this case study and voluntarily signed consent forms required by the university.

Held on Mondays from 1:15 p.m. until 4:00 p.m., the class began January 13, 2003 and ended May 5, 2003, meeting as a group a total of 12 times. The activities associated with each class meeting can be found in Appendix A, and as can be seen, actual class meetings were limited after the product had been decided, with most work taking place in individual group meetings held outside scheduled class periods. Clinic members met in a room specifically designed for interaction and presentation. The horseshoe-shaped arrangement of the tables allowed professors and students to sit wherever they liked, minimizing any overt positions of "power" and allowing for open communication. After groups were assigned in Week Five, group members began sitting together in the same general area from week to week. In keeping to the spirit of the clinic, the professors teaching the course limited direct instruction and served primarily as facilitators or content-matter experts (ITC/10/2; INT/16/¶49; INT/12/¶24; O/).[7]

The syllabus used for the Spring 2003 IT Clinic lists course goals related to instructional design, project management, and personal and teamwork issues (see Appendix I). The course process, as described in the syllabus, explains to learners that the clinic is essentially a problem-based learning environment, also noting, "Typically, the projects we engage in are ill-defined (and that's good!)" (ITC/10/3). Assessment for the course was based on five components, each worth 20% of the student's grade. The five components included: time sheets, status reports, design documents, public presentations, and a development journal. The course did not use a textbook, although two books on project management and various articles were made available to the students. Readings, therefore, were limited to what the students found relevant to their own needs. The development journal afforded students the opportunity to record the time they spend on the project, students were also to record and reflect on difficulties they encountered, solutions to problems, etc. Students composed their journals using a word processing program and sent their work electronically through tools found on the course web site. The journals were due three times during the semester. In a conversation with the researcher after the class was over, one of the Malawian students commented, that journaling was not commonly done in Malawi and he was not used to it, but the process helped him remember from week to week what his group had done, serving as a project management tool (personal communication, H. Mfune, May 2003). Selected journal entries and examples from other student work are used in Chapter Six in the discussion of the findings of the case study.

Because the final product of any given IT Clinic is generally not decided beforehand, students must spend time in class discussing the advantages and disadvantages of any given project. The negotiation process is part of the learning. While the product may be chosen at the end of the first class meeting, it is generally accepted that the class will take at least a couple of class periods to agree on the project goals. In the case of the Spring 2003 IT Clinic, a final decision was not made until Week Four. This delay was due to the fact that after the needs assessment was presented in Week Two, various contextual elements, some of which were left unanswered in the needs assessment report, had to be addressed and elements of Malawi's education system had to be clarified. While a specific class goal took some time to develop, the general understanding was that the outcome of the clinic would result in the re-design of ITMA

[7] The key to data codes can be found in Appendix B.

courses to be used in a distance-based degree program offered by Mzuzu University. If this had not happened in the IT Clinic, it would have taken place outside class, as this is what was promised in the original grant agreement and the Memorandum of Understanding (INT/20/1; PROJ/20/3; PROJ/16/1;5).

The issue of debate in the IT Clinic, therefore, was three-fold: who would be the target learners, what the program would entail, and how the courses would be implemented. The conclusion of the discussion resulted in the following decisions:

The initial distance program would:

- Be composed of five courses, with the first three being Principles of Instructional Design; Advanced Educational Psychology, and Instructional Media (the first three would be redesigned within the IT Clinic).
- Be offered as a B.Ed. honors program (pre-master's) at Mzuzu University.
- Be delivered via print or perhaps CD-ROM based materials.
- Be piloted for use with learners close to Mzuzu University who hold a bachelor's degree.

The elements of the discussions leading to these decisions are further documented in Chapter Six, as they contributed to the evolution of the project and the design elements.

Participants

A list of the general characteristics of the participants directly involved in the case study (those who were in the IT Clinic) is found in Appendix C. Some persons associated with the USAID/UPIC project are not listed as they were not formal study participants; their input is limited to background information and is documented by notations of personal communication. All participants who were interviewed signed an informed consent agreement, a copy of which can be found in the Appendix G.

Summary

The USAID-funded UPIC project, an endeavor that seeks to build human capacity in Malawi, brings together two universities: one from the mid-Atlantic region of the United States and the other from the southeastern part of Africa. There are many differences between the two institutions, as can be expected given the very different contexts in which each exists and the differences in their histories. Yet the core missions of Virginia Tech and Mzuzu are very similar in that they seek to educate people to expand learning, development, and prosperity. The efforts related to building human capacity are to be sustained through the adaptation of a pre-existing web-based degree program that goes by the acronym ITMA, or Instructional Technology Master's degree. The efforts to adapt and re-purpose courses in ITMA were largely coordinated through a course called the Instructional Technology Clinic. The clinic course had a total of nine students and three professors, all of whom participated in this study.

For the sake of clarity, each major case attribute has been described separately. Although the reader may now have a better understanding of the specific parts of the case, it is important to remember that the parts are linked. In the next chapter, which describes the findings of the case, a closer examination of how the Malawian context and other factors affected the re-design process.

CHAPTER SIX

Findings

Professor Black was sitting attentively as she always does when listening closely to someone speak. She was particularly attentive as Kondwani read the list of contextual elements that would help guide the redesign process. Despite his strong command of the English language – back home he is a language instructor – his manner of talking quickly combined with a Chichewa-British accent makes his words difficult to decipher if one is not looking straight at him. I glanced at the other Malawians who sat quietly as he read his section of the report. He was sure to point out that a very important person in the distance learning assessment process is the invigilator – every distance center would have to have one. *Invigilator*? Maybe I misunderstood what he said. A couple of the Malawian students nodded, silently agreeing that invigilators are important, so whatever he said, they understood it. I looked at the professor. She leaned toward the desk and poked her head forward as if to get closer to the same word that stumped me. The others in the room seemed to have the same dialog bubble over their heads asking "What is that!?" Finally, the professor asked the question on all our minds. Kondwani, thinking perhaps we didn't hear the word correctly, enunciated it, "Invigilator." She shook her head and it was clear to him that only the Malawians understood what he meant. He then told us that an invigilator makes sure that students do not cheat on exams. "Oh," I said, "You mean a proctor." Herbert, who helped lead the Malawian team, smiled, shrunk his nose a bit and asked with a quizzical smile, "What's that?" After the misunderstanding was cleared up, we laughed and talked a few minutes about "crisps" vs. "chips," "torches" vs. "flashlights" and "gas" vs. "petrol." (O/21/¶68)

Some of the language differences between those who have learned American English and those who grew up with a British influence stand out as starkly as does the contrast between driving on the right vs. left sides of the road. While the differences are sometimes amusing, they highlight the importance of redesign.

This case study set out to discover the specific practical and theoretical considerations that guided instructional designers as they adapted courses created by and for North American teachers for use by Malawian educators.

Outline of the Chapter

Following this introduction, I have divided Chapter Six into four parts. Part One focuses on background information concerning two important documents created by the Malawian team. The first document is their needs assessment report, created and carried out in 2002. The information from this report helped them understand their own context more clearly and served as a starting point for the discussions in the IT Clinic. An assignment our Malawian colleagues created for the IT Clinic, a context analysis, outlines specific areas that guided all designers as they redesigned the ITMA materials. The third section of this chapter offers a brief description of the three courses that underwent adaptation: Educational Psychology, Instructional Design, and Instructional Media. The descriptions are accompanied by comments made by the designers as they evaluated the courses for an IT Clinic assignment. Part four provides an in-depth examination of the practical and theoretical influences on the redesign process, looking at selected modules or chapters in each course for each stage of the instructional design process, from goals to formative evaluation. To conclude the chapter, I present a final contextual element where participants voice their thoughts about the redesign process itself.

Needs Assessment Report and Negotiation of the Design Project

Whereas Chapter Five gives a broad overview of contextual elements surrounding the case study, two specific factors impacted the instructional redesign project in a more immediate way: a needs assessment report and the process of negotiating the redesign project. This section describes the needs assessment report created by the Malawian team, a document which served as the starting point for the IT Clinic discussions and course transformation. Additionally, the process by which the actual project was selected is described. Participants had to negotiate issues of institution policy, time and resource limitations, and project goals before they could decide to move forward with a redesign initiative.

The Needs Assessment Report

Among the classes they were required to take as part of the instructional technology master's degree program, the five Malawians from Mzuzu had to take two courses specifically designed to help them implement newly learned skills in a realistic setting. The first course, a course focused the development of a national needs assessment plan, took place in the first semester of their program, Spring 2002. The second course, offered a year later, was the IT Clinic in which they adapted existing distance education materials according to contextual concerns and needs.

Anecdotal reports indicated a need for a substantial number of new teachers, and in fact two other distance-based programs funded by Western countries were trying to target that need (see Chapter Three for a description of the SSTEP and MIITEP programs). Little specific data existed on what kind of specific training needs existed and which specific contextual elements would influence a distance education project. Relying on their own inherent knowledge of Malawi ("contextual knowledge"), the students created the types of questions to be asked, determined how the plan would be carried out, and established a budget. The professors provided guidance and advice based on their own needs assessment experiences. Assigned readings came from selected articles and the book by Witkin and Altschuld (1995) titled, *Planning and conducting needs assessments: A practical guide*. The goal of the plan, as stated in the final report, "was designed to gather information in Malawi to guide in the designing and implementation of a distance-learning program relevant to the Malawian context" (NAR/1/28).

Upon their return to Malawi in May 2002, the students were to implement the plan and report its results upon their return to Virginia Tech in August 2002. The actual plan started later than was originally proposed due to problems securing a vehicle in which to travel (the Toyota Pravda ordered through USAID for project use still had not arrived in Mzuzu), but the students started their work in June and were able to finish the data collection just before they returned to the United States. Sadly, a tragic accident that claimed the life of one of the Malawian students and seriously injured another put all plans for immediate analysis and reporting on hold. Another member of the needs assessment team delayed her arrival to Virginia Tech in order to care for her newborn baby. It was not until January 2003 that all four of the remaining team members were together at Virginia Tech, at which point they were able to produce a final report.

In the planning of the assessment, the authors included measures of objectivity to ensure the validity of their data, such as randomizing the districts where they would collect data. But even with these steps taken, some practical difficulties arose. In the authors' description of study limitations, the fact that a vehicle was not immediately available had ramifications on the process of data collection. They note:

> Data gathering started four weeks later than planned because the automobile that was to be used did not arrive at Mzuzu University on time. This caused the researchers to gather data in haste. It proved very difficult to gain access to some documentation during

> data gathering process hence the limited amount of literature review reflected in this report. The planned meetings with the needs assessment committee did not take place because most members of the needs assessment committee were busy with other commitments. The number of respondents who took part in this research (190) was smaller than planned (277) because some respondents could not be reached. (NAR/1/12)

Each of the authors noted that there were a couple of questions that became somewhat problematic: one relating to student-teacher ratio, another concerning number of teaching hours per week, and one or two questions about Internet or computer usage. Alex, one of the authors, explained,

> We started developing questionnaires and the data collecting tools. From here they look like they are fine and they are clear. Most of the terms we used are clear. But when we went there we saw that many questions and phrases that we used needed to be redeveloped. Needed to be simplified in other words, there were some that they really didn't know what you're talking about. For example we use the word "pupil and teacher ratio". That's really simple anyway when we look it. But the target people we are really working on, and people really didn't know what they were expected to say. So we would see numbers that really didn't make sense. (INT/3/¶265)

Kondwani, another author, instead seemed to think that while they may have needed to change some questions, the target audience perhaps did not have the necessary skills to understand them.

> *Question: After your experience, after you've gone to the planning, you carried out, and then you did the analysis…over that experience, if you had to change anything, would you change anything? Would you have changed any part of that process?*
>
> Response: Oh yeah definitely. For instance if we were asked to do the needs assessment again today, the first thing that I would look at would be the type of questions that we had in the questionnaire. We felt we had better teachers there who are more intellectually sound, who easily understand and answer the questions that we had. That was wrong. We had to use plain, simple, straightforward language. They couldn't answer the question, and most of the times we had to take them, group them up, and then take them to the process of answering the questions. So really when books tell you that you have to make your tool very carefully, that you have to pretest your tool, and then redesign it, they know what they're talking about. Because the data collection tool is really very, very important and it has to be designed in such away that it's not going to pose problems for the what... to the subjects. That was one thing that I would definitely included is pre-testing. I would definitely pre-test my tool, it's very important. (INT/33/¶223-225)

Despite the acknowledgement that some questions were not entirely clear, the Malawians nevertheless expressed confidence in their data. Three of the participants did not cite many problems, but only two or three specifically problematic questions among the dozens in their questionnaire. In his response to the question, “How can anyone trust it?” Herbert laughed a bit and replied,

> Response: When choosing the districts for us to go and to study, we used random sampling of all 24 districts, but when choosing to secondary schools in each district there we did not do simple random sampling there it was convenient sampling because we were looking at maybe problems with transportation especially at the community day secondary schools. So we had this [ ] bias where we chose roads there are passable.

But we tried to make sure that we had one conventional school and one community day secondary school in each of the districts that we sampled.

Question: And how many total districts did you wind up doing?

Response: Thirteen, which is almost half, yeah? And we ended up interviewing, well giving questionnaires, to almost every teacher that we found, so we were looking at perhaps 10 to 15 teachers per school, which I would say gave us, it was quite representative of the school. Most of the schools would either have 10 teachers or those who had more, schools like ____ Secondary School had about 30, we took about 15, half of them. So it's maybe all the teachers or at least maybe half of the teachers were given questionnaires at the secondary schools we had. The bias could be from the convenience sampling of the respondents, but we did simple random sampling for the rest of the country, and we covered almost the whole country. (INT/21/¶52-57)

Except for uncertainty about some specific data concerning the teachers' work load and understanding of computers, the authors can be confident of their findings, as they generally parallel findings documented in other literature (D. Kunje & Chimombo, 1999; *SSTEP Malawi*, 2002; Stuart & Kunje, 2000). Anecdotal evidence provided by one of the study participants, a professor at Virginia Tech, who has lived in Malawi and knows the education system rather well (INT/41/¶110-114) also corroborated the reliability of the data.

The conclusions and recommendations that follow are from the final sections of the original needs assessment report as written by the five Malawian students in the IT program at Virginia Tech (NAR/1/32-33). The report was presented at the second meeting of the IT Clinic course (described in Chapter Five). A copy of the actual needs assessment questionnaire, a copy of a PowerPoint slide presentation given by the report authors, and the report's conclusions can be found in Appendix J. The authors noted the following recommendations, prioritized in the order they specified in their report:

1. Design courses to upgrade unqualified teachers to diploma and bachelors level using print mode.
2. Design courses to upgrade qualified teachers with diplomas to bachelors level using print mode.
3. Design pilot graduate courses in instructional technology for teachers with bachelors using computer-based and/or web-based mode(s).
4. When students enroll for the distance education program, their teaching load shall have to be reduced to give adequate study time.

The report was not sent to Mzuzu officials after January 2003 because it was still considered to be in draft form. The authors were to correct it and send it back to Mzuzu during the course of the semester, but a priority was placed on other course work, including the work surrounding the adaptation of existing ITMA courses. A visit in April 2003 by one of their colleagues, a man who is currently the coordinator for the Continuing Education Centre at Mzuzu, however, allowed the authors to receive some feedback about their report. He made minor editorial changes and wrote the following on the concluding page of the report:

- This is a very good report. It supports the thinking of most faculty at Mzuzu. A concept paper on the topic that is in circulation expresses similar suggestions.
- Our date of implementation of the program has been August [the authors wrote May 2003]

- Under proposed content of distance education for undergraduate, it would be better to include some subject content as MSCE holders are deficient in content too.
- It is a realistic modification to the original one [meaning the originally proposed plan found in the Virginia Tech proposal]. I am personally convinced that this would work in Malawi. (NAR/1/33)

The needs assessment report, as has been mentioned, was in essence the "leaping off point" for the IT Clinic course (NAR/1/5; O/21/¶142). While a compromise had to be reached in order to satisfy the demands of the USAID project agreement, the authors played a role in guiding the thinking of what could and could not be accomplished through a distance education program. During discussions in the IT Clinic course, the concerns and challenges in regard to the Malawian context were made more clear.

Negotiation of the IT Clinic Class Project Scope

To understand what changed in the ITMA modules, one should first understand the factors that led to the selection of the modules themselves. The negotiation process is a part of the context and, having some bearing on which adaptation decisions would be made, needs some explanation. The IT Clinic class served as a means for instructional technology students to work together in a learning environment that would help them establish design goals, allow them to work on a development team, and give each of them experience in project management (see Chapter Five for an overview). The first class meetings were therefore devoted to developing project goals that would then be the focus for the remainder of the semester.

As indicated by the needs assessment report, the students from Malawi found a shortage of qualified teachers across their country, most of whom were teaching in community day secondary schools. Given the very limited capacity of the traditional universities to meet this need, they surmised that distance education would aid in providing certification and training to under-qualified or unqualified teachers. To do this, they wrote, Mzuzu University would have to provide programs that allowed teachers to pursue either a diploma (two year) or a degree (four year).

Upon hearing the needs assessment report recommendations and getting clarification on elements of the Malawian education system and infrastructure (O/17), participants spent the next two class periods negotiating the scope and scale of a project. The professors took part in the discussion, helping to guide it with their knowledge of the ICET activity goals (Appendix K). Three issues drove the negotiations: who would be the target learners, what the program would entail, and how the courses would be implemented. The conversation was influenced by three factors: institutional policy, time and resource issues, and original project goals. Due to the fact that redesign took place within a class context, cost implications for the adaptation project were not considered, although, as a UNESCO report indicates, "the costs of adaptation…should not be underestimated"(UNESCO, 2002, p. 75). Policy, resources, and goals are described separately, but the three factors acted together to help define the project. As information about context became more clear (some parts remained fuzzy throughout), the decision making process was refined.

Institutional policy. Mzuzu University does not offer any master's degree program at this time. As is the case at many colleges and universities in the U.S., graduate programs at Mzuzu must be taught by those who hold terminal degrees. Since the Malawian students returning to Mzuzu would be graduating with a master's degree, they would not have the proper credentials. Therefore, when the IT Clinic participants began to discuss at developing a program modeled after the original proposal (a distance master's degree with up to 80 enrollees), the Malawian students pointed out that it was not possible given the current constraints. They raised this issue

in their context analysis, stating that before any educational program was established, approval by Mzuzu and the Ministry of Education was needed. It became clear that although Mzuzu is autonomous, it still functions under the government to some degree and would need a broader base of support than simply at the university's administrative level. Kondwani documents this in his design journal dated January 27th:

> Discussion of the needs assessment report went on and specifically focused on the way forward. There were two schools of thought here; the report indicated that the most priority need was the shortage of teachers in Malawian secondary schools while the grant document spelled out the fact that the initial plan was to train 80 Malawians to the level of Masters Degree in Instructional Technology. This however posed problems according to the class discussion because in the first place, it was noted that presently Mzuzu University only offers bachelors Degrees and so a Masters Degree program would take a little while to be approved. Secondly, it was also noted that since policy in Malawian universities stipulates that only senior lecturers can supervise MA students, it would be difficult for the Malawian team to go straight into supervising MA students. (JRNL/7/¶23).

In the following class, however, the students suggested a program that is essentially a "pre-masters," called an honors program. According to the students from Malawi, such programs are common and do not require a university to bring in a corps of Ph.D. holders to teach. Lecturers at the university with master's degrees are qualified to teach honors courses. Professor Underwood, a native of sub-Sahara Africa who has been at Virginia Tech for a number of years, knows both systems quite well. He has spent a great deal of time working with education professionals in Malawi and confirms the aspect of policy that prevents master's degree holders from offering master's level classes for credit:

> Underwood: Mzuzu has not got the credentials for the senior staff to teach at the master's level
>
> *Researcher: … They [the Malawians] originally said that the first thing they were going to do was develop a master's degree in instructional technology for Mzuzu University, but they don't have the capacity to do that because... are the only people who can teach master's courses in Malawi have to have Ph.D.'s?*
>
> Underwood: Yeah they cannot teach it with their masters, you see
>
> *Researcher: Oh so it's like here then...*
>
> Underwood: Right it's the same yeah. But they can teach BA honors you see
>
> *Researcher: Yeah that's what they're talking about*
>
> Underwood: You see they can say we have masters we can teach honors. And honors degree is a year after BA degree and then from there you can upgrade that masters. Instead of taking two years it takes one year.
>
> *Researcher: To do a masters*
>
> Underwood: Right. Because the content for the honors is very much like the masters
>
> *Researcher: So it's more like a scaled down masters*
>
> Underwood: Right
>
> *Researcher: Is that a popular program in Malawi?*

Underwood: Yeah. Not only Malawi but all British... it's a British culture. You see a BA honors and you say OK you've got honors and it's a little more than a [bachelors] but you are not in a masters yet

Researcher: So what they are planning on doing for this B.A. honors is getting people the skills to create curriculum. So it's like you said, creating that critical mass

Underwood: That's critical right there

Researcher: So you think this will be widely embraced?

Underwood: Oh yeah. They will take it because people understand that, even the politicians will understand that. If you say masters, they will say "masters... you don't have B.A. honors, how do you get your masters?" And at Mzuzu there is not any tradition of having awarded masters, "how did they get there? Is this a flight by night degree?" They will.

Researcher: So they need to see the steps that give the foundation for masters degree

Underwood: Right. And taught by the credentialed people

The issue of having the correct credentials, not only to teach the course, but also to design the courses, also came up in the discussions. Even the students who were not from Malawi realized that their limited expertise would not allow them to develop a brand new program without a good deal of interaction with subject matter experts. The time to do this and the resources at hand strictly limited this option.

Availability of time and resources. Design teams had to finish their project in a 15-week period, creating a tight schedule for teams to assess, plan, and adapt a course. According to the participants, the limited time did not permit them to work on some parts of courses that they might have otherwise developed more fully. Since all designers were students either taking other courses, were employed on a part-time or full-time basis, or would be traveling for conferences, time for development was quite limited. This restriction was evident early on in the IT Clinic. Professor Black, responding to a question I asked about the biggest obstacles facing the redesign efforts, indicated that time would be a major hurdle (INT/10/¶10), stating that it would be imperative for the design teams (groups of three) to meet frequently during the time allotted for course adaptation. So the issue of time limits, also a reality in the develop of instructional design projects by professional ID firms, became part of the alternate context for the adaptation of the courses and, as can be imagined, impacted aspects of course development.

Zhen Gao, a Chinese student involved in clinic mentioned that the limited time did not allow her group to read through the course textbook as thoroughly as she would have liked:

Researcher: …you already talked about time, how has the issue of time impacted your design process this semester?

Zhen Gao: Like when we design the syllabus part, I think it's easy because we already do all the ID plan process so we know our learner characteristics and what they should learn, but when we were working on the course content like each chapter, if we don't have enough time we can't read textbook, we don't have time to read, honestly we don't read too much textbook because we don't have time. If we had time we would read each chapter and try to find my own objectives and create my own activities… . So we not really look at each chapter and create our own, we don't have that time. So time issues is hard. (INT/43/¶216-218)

Alex commented that the time limitation meant that his group did not develop the post-course assessment as they would have liked. Jonathan wrote in a journal entry that the time limitation also affected the way his group went about dividing up work (JRNL/25/1), and even though Janet's group took a different approach to group work, she said that the decision to work as they did was partly based on time constraints (INT/29/¶86).

Another area where time became a concern is within the Malawian context itself, specifically in relation to those who would be coordinating the program. Those who deliver the course need time to prepare materials, distribute materials, evaluate work, etc. What became clear, though, was that they would not be released from their normal duties as college lecturers (O/22/¶110; INT/36/¶21). This was confirmed in late June 2003 in an e-mail I received from one of the participants in which he wrote, "The administration/the office of the registrar wrote each of us a welcome letter. The letter pointed out that we will continue working us before in our various departments. [We] have already started working in our departments" (EML/1/¶8). The effect of the early warning that duties and responsibilities in the distance program would be co-mingled with existing duties seemed to impact course design decisions, particularly in the area of assessment and evaluation (INT/32/¶160).

In the interest of creating a project that was "do-able" within the time available, students had to consider the ramifications of tackling a large-scale program; the resources for doing so were not in place. Creating courses for a yet undefined and novel (to Mzuzu) distance program to train unqualified teachers was simply not possible even though it was strongly suggested in the needs assessment that such a program is needed and desired. On the other hand, redesigning pre-existing courses that would fit into a B.Ed. honors program was entirely feasible and became the best choice given the design context. The following conversation took place during the third class meeting. It captures the point when the discussion turned away from focusing on simply filling gaps identified in the needs assessment, taking into consideration the scale of such a task.

> Herbert: Can I ask a question? The purpose of our gathering here is to design a course or courses? I was looking … even though the bigger problem is teachers who are under-qualified, [we should] use the resources we have here to help us design courses when we get back to Malawi.
>
> Jonathan: Are you proposing a course that would help you teach teachers?
>
> Herbert: We could use skills gained to train others.
>
> Jonathan: Are you looking at a train the trainer program? So that those who take the degree can then go back and train others.
>
> Anthony: Plant the seeds. The other problem is too big … politics, time, etc.
>
> Kondwani: Really the other problem is too broad. It would be very difficult. Are we agreeing that we should focus on the pilot run of the program of instructional design or educational psychology? If we look broadly at how to impact content courses and methodology courses, etc.
>
> Prof. Hale: I'm sure there's a course we could use both ways for master's level and for undergraduate or certification level.
>
> Prof. Goodman: We have to look at people you're responsible to and people you're responsible for. Those you're responsible to may not allow the graduate program. Those you're responsible for you may want to look more closely at what people can contribute. The first thing you have to decide is what the outcome will be. (O/18/128-144)

Herbert reiterated his sentiments in a chat we had while moving some furniture into storage, indicating that the availability of resources was an issue. I did not record the interview, but my field notes, taken very shortly afterwards, relate:

> I asked [Herbert] what he thinks is the best direction for the class. He reiterated what he said on Monday: The obvious need is trying to get the MSCE holders certified. But the class would not be able to necessarily do this, and he really feels like he and the others need practice designing a course, both for print and on-line. After all, he said, they have the experts in instructional technology and educational psychology here on campus, so (the class) should use them. Also, it would be hard to design modules for the MSCE holders because the content training they need (biology, English, social studies, etc.) is known by Malawian experts to whom they do not have ready communication. (INT/22/5)

Towards the end of the IT Clinic, I talked to Mi Ling and asked her if she would have preferred to have designed a course "from the ground up" or if redesign was preferable. She stated, "This particular course, we rebuild it is a better way, instead of... because we are not subject matter experts for this particular topic." I also discussed the developments of the class with another faculty member from Mzuzu University over dinner one evening. His visit to Virginia Tech was to learn about the program, what his colleagues were doing, and how his own expertise might be helpful in the distance education endeavors. Matthews said was encouraged to know that his colleagues from Mzuzu recognized that there really is no need for a master's degree program at the university. He also was glad that "they are looking ahead," in the sense that they want to do staff development to help people write distance education courses. He did say that people like Justina could not write a course in educational psychology; she does not have the knowledge (he used this just by way of example). Instead, the subject expert could write a distance course but with the help of Justina who knows about distance education (INT/36/40). This model is in fact not too much different than the one currently employed at Virginia Tech, where professors receive some training in distance course delivery, but often enlist the expertise of the IDDL staff to produce and develop the course as they professor her/himself provides content.

Thus, the practical factor of limited development time contributed to creating a context that helped define the redesign efforts and, in some cases, the instructional design decisions of the groups. Aside from institutional policies and availability of time and expertise, another factor to reckon with was the reality of outputs proposed in the original USAID proposal.

Original project goals. Initial conversations centered around the creation of a bachelor's program to upgrade existing, uncertified teachers in Malawi, as suggested in the needs assessment report. Given that so many teachers either needed basic certification or a program that moved them from a two-year certificate to a four-year diploma, the immediate usefulness of a graduate program was overshadowed by the more present need for lower level courses in teacher training. Anthony, an American student, remarked, "…I've been focused on developing graduate courses, but the need is for undergraduate courses" (O/17/¶184). Professor Black also remarked that through most of the first discussion, she was under the impression that bachelor's level courses would be created (O/17/¶237), and admitted that the target audience (unqualified teachers) would need far more than could be reasonably developed in the course of a semester (INT/9/¶35). During the course of the third IT Clinic class, where the goal was "to figure out what we can tackle given the time we have," there was an increased focus on the project goals. After all, Virginia Tech had proposed that besides training selected students in instructional technology, they would also help initiate a web-based master's level program for up to 80 learners. By the third class meeting, it was becoming clear that the program could neither be web-based (as called for in the original proposal, see Chapter 5) nor would it be master's level based on the contextual descriptions. But the time limit and the lack of resource personnel also

meant that a teacher preparation program was too much to do. However, there still remained the problem of having "deliverables." After over an hour of discussion, Kondwani spoke up and said, "We still need to agree on a direction," and this opened the floor to a more direct discussion.

> Prof. Hale: The contract does say that we will provide an instructional design program. It behooves us to move as quickly as possible toward that end.
>
> Kondwani: So we should not worry about what the needs assessment suggest, but by the contract?
>
> Prof. Hale: No, we should find an intersection where to two overlap. No, I would not say ignore the needs assessment. What I see when I read the needs assessment is print-based with educational psychology and then instructional design. The data doesn't necessarily indicate the need to work with computer or web-based materials. (O/18/¶148-154)

After a short break, during which time the Malawian students did not leave the room for some minutes but spoke in Chichewa, evidently about what had just been debated in class. Upon returning from the intermission, Anthony went to the board and created the following chart:

Project	**PRO**	**CON**	**Other**
Problem #1: diploma/degree upgrade	-Greatest numbers need this -Develop our skills [as designers]	-Politics [in Malawi] -Not enough skilled people	-Attrition once education is upgraded [educators leave for NGOs or elsewhere]
Problem #2: Graduate course	The contract is for this; we can probably do it; builds our skills and develops more with such skills in Malawi once course(s) delivered.	-Addresses fewer number of people -No current graduate system	
The "Prof. Hale" blend:	-Satisfies contract - Addresses both problems	-More to courses develop (spreads out skills)	

Figure 3. Chart that reproduces the possible project directions as discussed in the IT Clinic on January 27, 2003 (O/18/¶162).

Later in the conversation, Justina declared her opinion on the matter, "By focusing on the graduate program [the B.Ed. honors program leading to it], we are building the capacity the backbone. Although we will not be necessarily increasing numbers, but we are enabling future designers. We are not sidetracking but actually laying a foundation" (O/18/ ¶221). The direction of the project then became better formed in the participants' minds – it would not be a full-on

master's program as had been originally proposed. Hale admitted that the original concept of a master's program was developed with little contextual knowledge, "Bear in mind none of us had ever been to Malawi and didn't know what the hell we were talking about" (O/18/ ¶243). The idea of developing an instructional technology program for diploma holders (people with four-year degrees) was not solely moved by the project director; it was also proposed by one of the Malawian participants, Herbert, at the end of the previous class session.

The class then agreed that a pilot program of two to three courses which would serve as a guide to help develop a master's level program once the conditions at Mzuzu allowed it. In the pilot B.Ed. program, future learners would receive credit toward a master's degree should one be developed. The courses for the program would not have to be developed from scratch; they could simply be borrowed and adapted from the ITMA program. In the end, the original project goals were modified to fit contextual needs, and the "close" contextual needs (time, resources) suited the context established by the original goals.

Summary

Given the confluence of factors involved – demands of institutional policy, the short time for development, acknowledgement of time constraints on those returning to implement the program, and a need to satisfy project goals, the participants agreed that the initial distance program would:

1. Be composed of five courses, with the first three being Principles of Instructional Design; Advanced Educational Psychology, and Instructional Media (the first three would be redesigned within the IT Clinic).
2. Be offered as a B.Ed. honors program (pre-master's) at Mzuzu University.
3. Be delivered via print or perhaps CD-ROM based materials.
4. Be piloted for use with learners close to Mzuzu University who hold a bachelor's degree.

Description of ITMA Courses

In order for the reader to appreciate the challenge of redesign, this section to describes features of the courses adapted by the participants: Advanced Educational Psychology, Principles of Instructional Design, and Instructional Media. Within the general descriptions provided, there are details about course layout, materials required, scope, assignments, and feedback mechanisms.

Advanced Educational Psychology

According to its first or "home" page, the purpose of the on-line educational psychology course is to "allow students to explore educational psychology domains in-depth." (CD/1/1). The domains include "the nature, value, and application of educational psychology research to instruction, an in-depth exploration of learning theory, and the application of learning theory to instruction." One of the concerns the course seeks to address is the "gap between research and practice" and thus focuses on helping students who are teachers or who have been teachers apply theoretical knowledge to classroom experiences.

The course was designed specifically for those students who could not be on-campus for the classroom-based course or needed to take the class during the summer. The ITMA program allows a student to take the course at anytime during his or her program. However, given university regulations, students can only start the course at the beginning of an academic term. Students who take the course are generally required to complete all reading and work assignments within one semester or a six week period if they choose the summer option.

Created by a professor of educational psychology, the on-line course content is a reflection of the on-campus course, complete with numerous multi-media activities to engage the student. While I did not take Advanced Educational Psychology from the professor who designed it, I have taken other courses from him and can attest to the wide use of in-class activities that he uses to demonstrate concepts. As the professor has gained proficiency in web-based technologies, the number of special media elements in the on-line course has increased. Examples of this are impossible to show in print, but they include such elements as self-assessment quizzes, animations, and streaming content. The course web pages include links should students need to download updates for their browsers or browser plug-in software. The syllabus tells students, "…this course is a real "on-line" course. That is, you will spend a significant amount of time actually on-line, interacting with course material. Generally, you will need to set aside about an hour or more for each on-line session" (CD/1/13). Despite the need for updated software and so on, the professor who created the course told me that while the interaction with web-based elements is not absolutely necessary for a student to pass the class, they do reinforce learning. He added that since the instructional aspect of the on-line materials only supplement the textbook (*Human Learning*, 1999, by J.E. Ormrod), he would rather just have the students read the textbook if they could not interact with the multi-media material, saying, "Ormrod created a good text and what I've written doesn't replace it" (personal communication, B. Aimes, April 2003). The cost of the text is approximately US $80.00.

Although a student could take the course and complete the material without accessing the multi-media elements, he or she must at least be able to submit assignments and take quizzes via the Web. The submitted assignments include a 25-word summary for each assigned chapter in *Human Learning* (for a total of 18), a two-page application report used to assess student understanding of concepts, submission of a multiple-choice test after each chapter, and a final, comprehensive multiple choice summative assessment. The multiple-choice items are graded automatically via software and the papers and summaries are evaluated by the professor. When asked about his use of multiple choice items, the professor indicated that while this is not an optimal assessment method, for the sake of scalability he simply had to use an automated system (personal communication, B. Aimes, April 2003).

Too numerous to list here, the instructor has created learning objectives for each module (5 objectives x 15 modules = 75 total objectives). Each objective is written in the format recommended by Mager (1975), samples of objectives from random modules include:

Upon completing the module,

1. The student will be able to explain the four step procedure for completing each Module. *Course Introduction – Unit: Module 1*
2. The student will be able to analyze and explain a behavioral scenario based on the classical conditioning model. *Behaviorism – Unit 2: Module 3:*
3. The student will be able to apply the levels-of-processing model of human memory to everyday cognition. *Cognition I – Unit 3: Module 6*

Rather than describe the layout for Educational Psychology, I have created a site map and outline that shows the navigation structure and briefly explains its contents (see Appendix L). The web site design for Educational Psychology includes a banner at the top of the page so that students can access any of the six major areas of the site at any time (Introduction, Syllabus, Requirements, Organization, Modules, Resources). Additionally, the instructor has created files in portable document format ("PDF") for each web page so that if a student chooses to print the course, he or she can do so in a manner that maintains the integrity of the layout (upon printing some HTML pages, the formatting cuts off part of the text). Finally, the

instructor accommodates students who cannot obtain the text right away by making the first seven chapters of the class text available in PDF.

Because the change from a web-based version to a print-based version changes the media quite dramatically, it is important to understand how each module is presented. The instructor created Educational Psychology with a great deal of uniformity, a number of interactive and audiovisual pieces, and accommodations for those who might experience connectivity problems. The module format for the on-line Educational Psychology can be seen in Appendix L.

Principles of Instructional Design

The Principles of Instructional Design (ID) class is one of the foundational courses of the instructional technology program at Virginia Tech. All students in the master's or doctoral programs must have had at least one course in instructional design, yet many go on to take courses related to it in distance education or applications of educational psychology. It is a work-intensive course that emphasizes a constructivist orientation (Duffy & Cunningham, 1996; Tudge, 1990), where students build their own instructional design plans or projects for their final assessment, guided along the way by experts in instructional design. The home page of the course states that students "will be studying a systematic approach to the design, development, and evaluation of instruction" and they will examine

> the components of effective instruction … relative to how they have been developed within the field of instructional technology. Learners will apply these elements within a popular systematic instructional design model to solve a specific instructional problem through the design of an instructional program. (CD/2/1)

As an original ITMA course created by professors of instructional technology in 1996, the course has seen a few revisions and its most current version is a reflection of formative feedback assessments as well as changes to the ITMA curriculum itself.

The on-campus ID course is a stand-alone course taken over the course of one semester and is usually offered in the fall. The ITMA ID course can be taken in either spring, summer, or fall. It is reserved for those enrolled in the ITMA program only; on-campus students must take the face-to-face course. Like most ITMA courses, there is an administrative deadline (set by the university) by which students must finish a course, but the ITMA program itself does not have a formal deadline. As noted in Chapter Five, this open-ended structure in ITMA allows for more flexibility for distance education students.

The course activities lead to a comprehensive instructional design document that students then use to guide the development of a multi-media project they create in an ensuing course. A total of eleven (11) activities are submitted for assessment, all of which address a separate component of the design process from conducting a needs assessment to conducting a formative evaluation. Additional assignments include an activity dealing with ideas about design in general and the submission of a final report.

Students submit all assignments in electronic form through a web-based interface also used by course graders and the instructor of record. Students receive feedback (which is often extensive) on their work through the same web-based interface. Various iterations of ITMA have seen different grading models, but currently grading is done by instructional technology doctoral students under the supervision of the ITMA faculty administrator (who also happens to teach the on-campus ID course). An important element to note in all ITMA courses is the presence of evaluation rubrics. The rubrics provide students with a list of criterion by which their projects will be graded, letting them know the point totals associated with each facet of a written assignment or a project.

As is the case with Advanced Educational Psychology, the on-line course content is meant to supplement readings from a textbook. The ID course uses the book, *The Systematic Design of Instruction* (2001) by authors Walter Dick and Lou Carey. Students are strongly advised, but not required, to read the Robert Mager (1997) text, *Preparing Instructional Objectives: A Critical Tool in the Development of Effective Instruction.* The main class text, if a new book is purchased, costs a student about US $ 85.00. Unlike the psychology course, there are very few multi-media elements with which to interact; yet there are links to other web sites, such as the Virginia Department of Education "Standards of Learning" or PDF files that illustrate a particular concept. The ID course includes graphics (mostly flow charts) and web links for the student, but the primary means of communicating what would be "lecture notes" is through text.

Upon being printed onto paper in its current form, the web-based ID course amounts to approximately 90 pages. Each lesson tends to fall between five and 10 pages in length, although some are longer. As shown in Appendix N, the format of each chapter is uniform.

Instructional Media

The content of the ITMA Instructional Media course is specifically designed for current classroom teachers, with much of the instruction focused on the creation of technology-based lesson plans. However, the designers of the course, when creating written assignments, kept the requirements open-ended so that any professional in the field of instructional design could learn from the content. There is an assumption that teachers will have some familiarity with and access to modern educational technology tools, but a good deal of the instruction focuses on the proper integration of such technologies rather than emphasizing knowledge about all of the functions. The course is similar to an on-campus course designed for pre-service teachers. Upon completing the course ("module" as it is called), learners are told they will be able to accomplish the following: "identify basic media forms, select media and technologies to fit instructional needs, incorporate media and technologies into lesson planning, utilize media and technology to enhance instruction, successfully integrate media and technology in the instructional program, and identify future trends in media and technology" (CD/3/1). The goals of the lessons align with those found in the course textbook, *Instructional Media and Technologies for Learning* (7^{th} edition) by Heinich, Molenda, Russell, and Smaldino (2002). Students are asked to order the text either through the university bookstore or an on-line book retail outlet (cost is close to US $75.00).

Since so much of the content of the course is found in the textbook, there is very little instruction on the web site itself. Essentially, the web site is a step-by-step syllabus. What it also does, however, is provide students with links to external resources and lets them access practice quizzes and end-of-chapter assessments. The content for each chapter is two to three pages when printed out, with each page keeping a uniform look. The major headings on each page are shown in Appendix P.

In addition to guiding the students' completion of required reading and tests, the web site for Instructional Media also details what is expected of the student in the "Integration Activity," a major part of the student's overall grade. Almost every chapter includes two activities; students must do at least one as well as completing the on-line chapter test. An example integration activity can be seen in the example lesson included in Appendix P. Each activity is accompanied by a rubric that clearly indicates what elements they must include and the point values attributed to each.

To complete the written assignments, students must create a web document that graders can view and evaluate using a web browser. Students are given specific instructions about how to save, name, and upload their work. This element requires that students have access to an web folder, but all students at Virginia Tech are provided with 30 MB of space

upon matriculation. This folder, known as the “Filebox,” thus becomes a repository for student work, which then is displayed in an electronic portfolio before the student graduates from the ITMA program. The students’ work is not evaluated by a professor, but by upper-level doctoral students in instructional technology who are employed by the ITMA program. The graders, however, are under the direct supervision of the instructor of record. The web-based quizzes and tests are scored automatically.

Summary

Although the three courses selected for redesign are somewhat different in regard to presentation and content, the subject matter in each parallels or complements information in the other. Professionals in education contributed to the creation of all three courses. Each course is offered to students for graduate level credit. The courses, being web-based, rely on technology available only through the Internet, allowing access to such components as quizzes or tests with immediate feedback, links to a wide variety of other web-based resources, integrated databases with individual student records, electronic repositories for work, and audio, animation, or movie files that allow a student to see and hear rather than read. With the exception of final projects for Educational Psychology, evaluation of students is largely done on-line, automatically through a program or database, or by a group of graders under the supervision of a professor. Both Instructional Design and Instructional Media are laid out in a way that students can easily print the web documents, and the Educational Psychology course has links to PDF files where the content fits on a standard, 8.5” x 11” piece of paper. The courses have a uniform look unique to themselves and user navigation through the courses is facilitated by a structure that makes moving back and forth between pages relatively easy.

The challenge for the participants in the IT Clinic was how to take the layout and content described previously and transform it into something that could be used in a Malawi-based distance education context. Once specific contextual concerns had been addressed, students analyzed the courses to start the redesign process. The contextual concerns, student analysis of the courses, and their instructional design blueprints are described in the following section.

Contextual Concerns, Course Analyses, and Design Blueprints

This section presents the perspectives of the IT Clinic participants found in the course analyses documents and the blueprints for instructional redesign of the Educational Psychology, Instructional Design, and Instructional Media web-based courses. An analysis of each course was completed by individual students, whereas redesign blueprints were created by the three-member teams, each of which included at least one Malawian colleague.

Contextual Concerns

This chapter opens with a conversation that took place during an IT Clinic class. The use of the word *invigilator* was perfectly clear to the Malawians, but even though it was an English word, it was not so clear to people from other English-speaking backgrounds. The confusion about the word was à propos; the Malawian participants were at the time presenting contextual concerns that might be addressed in the redesign process.

Students involved in the redesign process also felt a discussion of context was important. Soon after the IT Clinic began, Anthony noted that he had been reading information on the Internet about Malawi to find out more about the country, expressing some uneasiness (at the time) that he (INT/6/¶9,13) did not know much about the education system in Malawi or even Mzuzu University’s distance policies. Zhen Gao, writing in her development journal, mentioned, “I learned that to make this project feasible, I need to consider the needs and design process according to the specific context in Malawi and think from the perspectives of the Malawian students” (JRNL/9/¶42). Similarly, Jonathan noted in an early journal entry, “I thought

these courses would be a nice fit for this type of instruction but I feel like I need more context relative to the culture and literacy of the learners" (JRNL/5/¶8). With questions about context looming in many participants' minds, the IT Clinic instructors tasked the Malawians with creating a report on contextual factors. Working together, they identified six areas of context that they felt would have an impact on instruction: culture; language; gender; politics; design; and communication (ITCA/15/1). The contextual factors surrounding infrastructure, such as how much access learners have to a computer, phone, etc. had already been addressed in the needs assessment report.

In regard to cultural considerations, the team indicated that an important item to consider is the communication people use in talking to each other. In my own interaction with the Malawian students, including others at the university in another program, I noticed that they would always call each other by their last name. And at the beginning, when they first arrived in the U.S., if I would ask, "Did you know Janet before you came to the States?," I would invariably get a response of "Who?" I would then say, "Ng'ambi" (her last name) and the person I am talking to would say, "Oh!". They adapted quickly to calling me by my first name and got used to hearing their last name, but even towards the end of their stay, I would hear Alex ask Herbert, "Where is Likhwala?" (being the last name of a close female companion). So, in their cultural concerns, our Malawian colleagues pointed out that instructional text should use the same convention, that interaction between people should include titles and last names, not first names. They also noted that culturally appropriate examples should be used in the course materials. Along the same lines, they expressed a desire to be sure that both genders were represented equally in examples.

Another area of context to be considered is the use of language in the materials. All formal instruction in Malawi, starting from about Standard Three (3rd grade) is conducted in English, and specifically, British English. While there is debate about the use of indigenous languages in schools in Malawi, the Malawians tell me that since their country has so many tribal dialects (Chichewa, Yao, Tumbuku, Ngoni, etc.), it would be very difficult to make education consistent across regions (INT/¶36/30). The merits of English versus indigenous language, however, are not the subject of this study and were not investigated. The team's concern about language, rather, had to do with the use of formal English in instruction, such as eliminating contractions (it's, isn't, etc.) and replacing them with their original form. The Malawians stated that what may seem conversational and "friendly" to U.S. distance education students may be distracting in Malawi as English speakers there are not always familiar with the informal expressions native English speakers, particularly North Americans, often use even in written form. Another concern they expressed has to do with idioms or nouns that may only be found in the United States or even certain regions in the United States. They stated, for example, that our use of the word "gas" (for cars) is actually "petrol" in Malawi and would need to be changed. Furthermore, spellings common to readers of U.S. English are not the same in British English. For example, in a distance learning module created for the Domasi College of Education (Chiponda, 2001), one finds the following passages, "Note that Italy would be resettled and the scarcity of recruits for the army would be minimised," (p.6-107) and then, "You may appreciate that his programme was to repossess public land held illegally…" (p. 6-107). In the first passage, the "s" in *minimised* is replaced by a "z" in standard U.S. English. In the second sentence, not only is "program" spelled with extra letters (according to common U.S. spelling), but the sense of the word is different as well. During my interaction with the Malawians, I would sometimes hear that a particular activity, such as shopping or going to the library, may not be part of their "program." By this, they simply meant part of their plan or agenda for the day. In the case of instructional text, the differences are unlikely to cause a huge deficit in understanding, but misspellings (or what the Malawian learners perceive to be

misspelled words) and non-typical uses may create the "noise" that interferes with clear communication.

The Malawian team also noted that a multiple-assessment formats should be implemented in evaluating student performance. They remarked that assessment is another cultural consideration due to learners' exposure to certain kinds of tests and the limited communication infrastructure. Additionally, they stressed the importance of authenticating student work through the use of invigilators (proctors). Communication between course administrators, instructors, and students was an important contextual consideration. The team noted that e-mail is not widely used, but telephone and mail contact could be more frequent. They suggested that face-to-face interaction should also be considered. While the ITMA program no longer uses face-to-face meetings, they felt that a new distance education program at Mzuzu would likely need to include it, at least initially, in order to reassure learners, answer questions more fully, etc.

In what turns out to be the most extensive part of the contextual considerations document, the team from Mzuzu highlighted concerns not related directly to instructional design, but to program administration. They listed the following items:

1. Prior approval should be sought from government and Mzuzu University before starting any educational program.
2. The Faculty or department under which the IT program will fall is not clear (Faculty of Education or Distance Education or Continuing Education?)
3. There is a need to liaise with other departments in the university regarding program logistics.
4. Student financial contribution toward the program is not yet clear.
5. What role will Virginia Tech have during implementation of the program?
6. What number of courses will constitute an honors degree program?
7. The project needs to have separate, autonomous resources for smooth running of the program.

Many of the concerns raised in the discussion of the "political context" remained unanswered throughout the redesign process; some simply could not be answered without direct conversations with Mzuzu officials (some of these conversations are documented earlier in this chapter; see "*IT Clinic Project Negotiation*"). Because the focus of the IT Clinic was on the instructional aspect of the courses, clarifying concerns of the political context was beyond the scope of the IT Clinic. Moreover, such discussions were not to occur between students and Mzuzu administrators, but between project directors at both universities. Therefore, given that the redesign efforts examined individual courses and not program-wide issues, the participants concentrated on looking at areas that could be changed given the materials, personnel, and time available.

Course Analyses

Following the presentation of the needs assessment report and the report on contextual considerations, students in the IT Clinic were asked to evaluate ITMA courses[8] and "determine

[8] The educational psychology course that students' analyzed was different than the one that was later redesigned. The former titled, "Learning Theories for Instructional Design" was not yet complete when students began the redesign process. However, as the content and presentation of both courses share some similarities, it is still useful to examine the issues raised as students examined the course contents.

possible advantages and disadvantages of each when delivered by print and also by computer (CD-ROM stand-alone)" (ITC/1/4). The exercise was designed to alert students to the possible areas needed for change. The analyses did not follow a standardized format and the level of analysis is uneven. No CD-ROM product was created for the courses, so I will refer to the comments about computer-based modules infrequently. Although participants evaluated each course separately (as opposed to making general remarks about the three courses overall), they made observations across courses that can be classified into three problematic areas: access to and applicability of printed materials, development of dynamic feedback mechanisms, and establishment of proctored assessments. Some of these issues are documented in the actual assignment calling for course analysis, but interviews, observations, and journal entries also brought challenges to light.

Access to and applicability of printed materials. A concern common to all courses chosen for redesign was access to textbooks by the prospective learners in Malawi who are not likely to be able to afford them. Other disadvantages include the fact that textbooks cannot be "revised" as the on-line text could be and printed materials cannot be used to replicate activities that require access to computer technology or electronic equipment. The sole advantage of having texts available for IT Clinic participants is that they did not have to then develop loads of instructional material outside the web-based content, potentially allowing them to redesign many more courses in a shorter time period (O/18/¶231).

The descriptions of the ITMA courses show that the total cost for all three texts (for one student) would be approximately US$250, and this does not include the shipping and handling costs of getting textbooks to Malawi. A lecturer with a bachelor's degree at tertiary institutions in Malawi typically make less than US$200 per month. One can see the problem is less of logistics and more a problem of economics, a problem also noted by at least one Malawian evaluator doing formative review of the redesigned courses (EVAL/4). Interestingly, one student from Malawi wrote that obtaining a text would be no problem – that students could simply buy it (ITCA/13/¶49). It is quite possible, though, that the student who wrote this based the comment on her own experience in the IT master's program, where she was provided with project funds to buy textbooks for all of her classes. The student who made that comment also acknowledged, in a casual conversation, that while at university in Malawi, she received an allotment for books. Students who did not receive such an allotment would use books stored in the university's library (O/22/¶21). Herbert acknowledged the need for donor money in a later class (O/16/¶71). No such allotments or book purchase plans were discussed in class and the project budget does not make such provisions (PROJ/20). Other students were less optimistic about the availability of textbooks, as seen in Anthony and Zhen's comments:

> Anthony: It is my understanding that textbooks are expensive in Malawi. If textbooks are not a reasonable expectation of the students in Malawi, what alternatives can we develop, or make use of, in the course of this semester? Can articles be distributed to the students in print via the Mzuzu University library in partnership with Virginia Tech? How many students would partake in a first offering of these courses? Perhaps it is possible to obtain donations of used textbooks, even older editions, to use in the initial course offerings.
>
> Zhen Gao: Access to the text book. I don't think students in Malawi have the ability to buy this text book individually. It maybe possible for several students who are in the same geographical place buys one textbook together. Or they can find this book in their local library.

Some participants wondered if it was possible to get permission from the publishers to copy the textbooks. Anthony, acting on his own initiative, contacted the publisher of the book

used for the course his group was redesigning. To the surprise of everyone in the class, he actually received permission to make photocopies of the book so students in Malawi could use it (EML/2). But even with permission to make photocopies, Alex questioned how Mzuzu could afford paying for the massive amounts of copying to be done (ITCA/7/¶61). Towards the close of the course, Prof. Hale agreed to purchase a limited number of texts for each course, all of which would be placed in the Mzuzu University library. This solved the problem of how students close to Mzuzu could access texts during the pilot phase, but the question of textbook distribution to distant students remains unresolved. There is the possibility of scanning the text and placing it on CD-ROM, but with personal computer ownership so limited in Malawi (see Chapter Three), it is a solution not likely to be widely embraced.

Another problem with the reliance on textbooks is the difficulty designers might have in trying to change material into a more relevant form. The web-based material can be changed in a word processor, but examples in a textbook that are only relevant to a North American audience that speaks American English would have to be explained with more text. This problem is similar to one documented by Wilson (1999), where West African learners struggled not only with language in western-created texts, but also with concepts foreign to their experience. Making the texts electronic (editable in a word processor) would help alleviate problems (O/21/¶65), but doing so would require scanning and text conversion technologies, special copyright permissions, as well as a lot of time. Given the current realities, this option is very unlikely to happen. The other option would be to create new textbook materials, yet this also would require much time. In the various classroom discussions and in my interviews, the Malawian participants did not seem to concerned about the textbook issue when asked what they felt the biggest challenges to redesign had been. This may be due to their own exposure over the course of their many years of education to books produced in Anglophone countries (INT/23/¶206), as Herbert talked about in one of our interviews:

> Herbert: For example with us, because we did that course when we had stayed here for four months, went back to Malawi, so most of the examples make sense, you know because..
>
> *Researcher: You had been in United States.*
>
> Herbert: Yes. But for somebody who has not been here, that would be a very good thing for somebody who hasn't been here or to the UK, read the book and then maybe when they ask you, “What does this mean? This example and whatever?,” you would take those and use them in the redesign of the course. So I can see the redesigning of all these courses, especially the ones they use the textbooks from here continuing until we do the evaluation, actual summative evaluation, so that we can see which examples work and which ones do not work. And we would be the wrong people to do that because we've been here, and even people like [Mzuzu administrators] would be the wrong persons to do that because they've been exposed, you know. So they would look at these examples as being normal. So the students, once they interact with the book, we'd actually ask them to say, “If there's anything that you do not understand for a chapter, write it down and send it to us, because that would help us continue designing the course and also giving them feedback.” Because I'm thinking that maybe we would need to visit them at whatever interval we decide, to sit down with them and discuss the problems that they would have an how we could change something. (INT/23/¶214-218)

Herbert’s comments seem to suggest that the context of redesign in the United States is itself problematic because it does not allow the designers access to the target audience. They, themselves, had had so much exposure to the materials that understanding certain examples seemed natural. One anecdote that illustrates this occurred when Justina, a Malawian designer,

overlooked an example in the course materials on which she was working that asked students to imagine the distance from Washington, DC to New York City. She felt comfortable enough with U.S. geography to understand what was being asked. The third-party reviewers (also Malawian) caught this, however, and wondered why it couldn't be a Malawian example instead. The example was later changed. It is for this reason that a pilot testing phase of the courses will be implemented.

Participants identified one other major challenge to using print-based materials. They recognized the fact that a textbook or a piece of paper simply can not replicate interactive activities done on a computer through software or through the Internet. The Instructional Media course presented the biggest challenge to a print-based medium because the material created for it relies almost exclusively on Internet connectivity. It would require a great deal of paper to hold the plethora of "extra" information available to students via the Internet – those materials simply can not be reproduced in a cost-efficient manner. The Instructional Design course did not have any interactive instructional elements and so could be converted with relative ease (except for the issue of a dynamic feedback loop, described below). The Educational Psychology course students analyzed did not have multi-media elements, but the one that was eventually redesigned did, meaning that the students involved in redesign of that course had to choose between eliminating those elements or recreating them in such a way as would suit the printed page. It is at this point that some students felt that a CD-ROM would be helpful, in that it could hold the animations, movies, and audio lectures (ITCA/7/¶108; ITCA/11/¶18; ITCA/16/¶19).

Development of feedback mechanisms. An important aspect of administering a distance course is the mechanism by which instructors and their students will interface one with another. In traditional, print-only modes, communication is done through the postal service, which eliminates some types of feedback. Today, in an electronic, web-based mode, communication can be done in real-time or within a few hours depending on the instructor's and students' schedules. But time of feedback is not the only important factor in communicating with students about their performance – the print medium is limited in other ways, as explained by Bates (1995):

> A major weakness of print is the difficult it has in assisting students who have failed to understand parts of the text. While good print design tries to reduce the extent of misunderstanding, there will always be occasions where alternative explanations or a different approach are required for those students who have difficulties. … Another weakness of print is its difficult in providing feedback for questions that have a variety of acceptable responses, or which require complex or elaborate responses, or for challenging and 'discussing' the appropriateness of students' responses to in-text questions. (p. 120-121)

The points Bates (1995) makes parallel the concerns expressed by the students, particularly those Malawians who graded ITMA student work and experienced for themselves a data-driven, web-based feedback system that relied on the use of evaluation rubrics. In my conversations with Alex and Kondwani, both gentlemen described the difficulties associated with giving feedback to students. Alex, for instance, talked about the reaction of the learners to problems and why timely feedback would be important:

> Alex: You could see the panic when people are maybe they are far away from the instructor. Now they felt like they are not very sure about doing something, so they would maybe try it and then when they expect maybe to get feedback and when they get the feedback they say "Oh yeah… I think that should be… I missed that point" So it's like they are always doing something but they weren't very sure and whenever they submit assignments they will you that "Could you just look at it I'm not sure whether I have done

it. Is this OK?" or something like that. They were always not very sure of what they were doing until maybe you give them feedback. (INT/3/¶25)

Kondwani, likewise, talked about the importance of timely feedback:

> *Researcher: You talked a little bit, you actually talk a lot about feedback and you said that the feedback needs to be immediate, right away... why does it need to be?*
>
> Kondwani: The reason why I found that to be, that it has to be immediate, is simple. For instance in the instructional design course, because I graded instructional design, whatever [you're writing in the] needs assessment is something that you're going to use in the next stage. After needs assessment, what you have been writing in that stage, is what you're going to use in the next stage, so feedback has to be immediate. Because otherwise students are going to get stuck or if they continue they may not do the things at their best because at least as far as instructional design is concerned they have to use whatever they have learned before that. (INT/33/¶187-189)

The student analysis documents revealed concerns about how feedback would be carried out, especially as it related to the Instructional Design course – a course that relies heavily on interaction between the novice designer and expert designer. The two other courses, because they rely on multiple-choice assessment, have an assessment structure more suitable to print methods. Learner responses do not need immediate feedback as learners can progress from one module or chapter to the next without a very good understanding of the former. Students who have taken the Instructional Design class and the professor who teaches it acknowledge that a step-by-step process is required for the ID class (INT/16; ITCA/16¶35; ITCA/19/¶15; ITCA/13/¶17). Recognition of this factor seemed to contribute somewhat to the revision of the kind of product learners in Instructional Design would develop, as Janet observed. Concerning the ID course, she wrote, "Time allotted to this course is also short more especially if the learners are to be involved in such a project as they will need constant feedback from what their teachers make of their projects progress" (ITCA/12/¶10). Feedback given to students in the ITMA ID course is individualized as each student creates his or her own project. The group that redesigned the ID course engaged in a good deal of debate on what impact this would have on the eventual course administrators at Mzuzu (O/22). The groups' final decisions (at least final in the context of the IT Clinic) for feedback mechanisms are discussed in a subsequent part of this chapter. For the other two courses, where final, multiple choice assessments are the order of the day, not projects, participants recognized that it was necessary to provide supervision for the tests. Proctoring, or invigilation, then became another issue of concern.

Establishment of proctored assessments. One issue that was a question in the minds of the participants was how the convert the web-based assessment items to printed form. Besides developing a timely feedback mechanism, a remaining challenge was how to create assessments items for print. Two of the three courses selected for redesign rely on Internet connectivity for the multiple choice tests and quizzes. The technology does not render the ITMA courses "cheat proof," but the advantage is that chapter or unit tests can only be submitted only if a student had provided an identification code and password. In Malawi, it is likely that a student taking a test would not be using a computer at home, but would have to go to a computer center, so identification would be necessary in any case. In print mode, the ability to cheat seemed to be a bigger issue. The literature review (Chapter Three) describes various aspects of Malawi's education system, a system heavily reliant on standardized tests at many levels. There has been much controversy in recent years surrounding the administration of the Malawi School Certificate Exam (MSCE) as cheating has been difficult to control (Panafrican News Agency, 2000).

One participant wondered, “Is it in their [Malawian students’] nature to cheat like a lot of Americans?” (INT/6/¶25). The Malawians acknowledged that their students would have the potential to cheat. Mzuzu University prescribes test taking behavior, though, so when Kondwani’s group was editing the web-based text, they decided to remove the honor code statement and tell students they should refer to their university handbooks, which (according to Kondwani) contain guidelines on test-taking behaviors (O/15/¶56). Participants tried to plan means of proctoring, or invigilation (ITCA/11/¶11; JRNL/1/¶56; O/15/¶80). The ideas designers developed for possible ways to prevent dishonesty on evaluations is described in the section detailing how the redesigned courses changed. The plans students created to redesign courses, named “design blueprints,” are described in the following section. The plans illustrate how elements of course analysis factored into decisions concerning course adaptation.

Design Blueprints

The syllabus for the IT Clinic course required students to develop a design blueprint (ITC/10/¶68) that would guide them as they redesigned the ITMA courses. The blueprint was basically modeled on a document constructed by an alumnus from the instructional technology graduate program at Virginia Tech (ITC/4). The groups worked independently and each took a slightly different approach to creating their own blueprint document. A comparison of the headings created by each group is shown in Table 1.

Table 1.

Comparison of Design Team Blueprint Outlines

ED PSYCH (11 pages)	INSTR DESIGN (10 pages)	INSTR MEDIA (12 pages)
Introduction	Big picture	Overview of problem
Instructional Goals	Objectives	Instructional goal
Analysis of Learners	Instructional strategy	Learner/context analysis
Performance Objectives	Outline of content	Theoretical justification
General assessment	Media/materials to be created	Performance objectives
plan	Appendix (analysis of	General assessment plan
Instructional strategy	learners)	Instructional Strategy
		Process of study

Since not all headings match, a comparison of the groups’ design plans is organized by using the following categories: overview; goals and objectives; learner analysis; instructional strategy; assessment plans; and logistical considerations.

Overview. Design documents for each group make clear the purpose of the redesign, which is to adapt a web-based, master’s degree course in instructional technology to a print-based, honor’s graduate program. Each group mentions that the influence of the needs

assessment on the redesign efforts but do not provide specific detail except to note that the print-based delivery method was preferred among those surveyed in Malawi.

Goals and objectives. Except for minor editing, the goals and objectives for the Educational Psychology and Instructional Design courses are not different than found in the ITMA courses. The Instructional Media design document lists two course goals rather than six listed in its ITMA counterpart, but in the final redesigned course submitted by the group, the six appear again.

Learner analysis. The learner analysis for each group should have been exactly the same since the redesigned courses are each going to be offered at Mzuzu University, but given that groups did not meet together to compare their blueprints, some variations exist, as shown in Table 2.

Table 2.

Learner Characteristics as described in Design Blueprints.

	ED PSYCH	INSTR DESIGN	INSTR MEDIA
Learner age	20-40	Heterogeneous group	25+
Male/Female ratio	73% / 27%	Balanced	50% / 50%
Employment	Teacher at conventional secondary school or CDSS	Teaching preferred but not required	High school teachers
Education	Bachelor's degree	Bachelor's degree	Bachelor's degree or a "good diploma"[9]
Experience	4-10 years	(not included)	< 10 years
Length of program	20	20	(not included)
Number of learners	2 years	(not included)	(not included)
Prior knowledge required?	No	No	(not included)

In regard to motivation for enrolling in the honors program, the groups identified essentially three factors as increased knowledge; betterment of job skills, and increased personal marketability (with promotions and salary to follow). Interviews with Malawian participants, though, revealed some questions about motivation of learners. One participant

[9] * A "good diploma" results in graduation from a teacher's training college (TTC) with high test scores (O/20). TTC's offer a two-year education.

emphasized that learners must be “incentivized,” stating that learners must have some assurance of higher pay or promotion if they are to enroll (INT/36/¶45).

Toward the end of the semester, as redesign efforts came to a close, I asked another participant if the decision to create a honors’ course was satisfactory. The response surprised me a bit:

> *Researcher: Are you satisfied with the compromise personally?*
>
> Respondent: Personally, frankly speaking, I'm not so satisfied. Because one, an honors program or degree does not entail much satisfaction in terms of rank, promotion, increments, for the learners. People may not get motivated to do the honors degree in and of itself, you know. But I think the only motivation would come if they look at the honors program as a bridge to something else. (INT/#/¶316).

The “bridge” the participant refers to is the eventual creation of a master’s degree program. During an early class session, students and faculty discussed the potential of a master’s degree being developed at Mzuzu after more staff had risen to Ph.D. level. Those who had enrolled in the B.A. honor’s program in I.T. would then be given the right to pursue the master’s program. The impact of lack of incentive to enroll, though, did not seem to be of much concern (vis-à-vis instructional redesign) to others as it was not mentioned in class, in journals, or in interviews.

Instructional strategy. At the time the Instructional Design group created their blueprint, they were under the impression that they would not be using the Dick and Carey (1996) book in their instructional sequence, thinking that learner access to any text would be quite limited. But Anthony’s efforts to gain copyright permission to reproduce the book came after the blueprint and the instructional strategy for the Instructional Design course included the textbook once again. The two other groups had no intention to drop the book, although Mi Ling did have misgivings regarding accessibility and applicability of the textbook in the Instructional Media course, as documented in the minutes (ITC/9/8-22) of one of their group meetings:

> [Decision] We will use *Instructional Media and Technologies for Learning* as our textbook.
>
> Mi Ling: It will be overwhelming for us to write the content of this book or just several chapters of this book. But I am not sure if students in Malawi will have access to this book.
>
> Kondwani & Janet: We will use this book. And Janet think they have several copies back in Malawi. They will think about how to let all students have this book.
>
> [Decision] We will need to use all the chapters in our course.
>
> Mi Ling: I don't think Malawi students have access to some of the technologies in this text book. Should we ask them to study those chapters and sections?
>
> Janet: We can use all the chapters since they are more on theories and it will help them to get to know the cutting edge technologies.

Other instructional strategies outlined in the three blueprints paralleled the scope and sequence of existing ITMA courses, indicating that they would follow the current order of chapters or lessons as it existed. Other changes, such as dropping some content specific to the United States (i.e. references to public school Standards of Learning in Virginia) and removal of multimedia elements was also noted. In the case of the Educational Psychology course, designers thought they would use transcriptions of audio and video content, putting the lecture into a text-based “supplementary notes” section.

Assessment plans. The main change in the instructional strategies the groups indicated concerned the assessment plans. In the first place, since the course would be print-based,

courses with practice tests would also come with the answers to those tests. Chapter tests would be open-book and returned via the postal service and feedback would not be immediate. While activities, writing assignments, practice quizzes, and chapter tests would reflect the same or close to the same content in the courses, designers involved in Educational Psychology and Instructional Media stated that proctors would be needed for supervision of the final test. The Educational Psychology blueprint declares that learners would go to Mzuzu to take their final test, whereas Instructional Media students would go to a satellite center of some kind to take their final exam. A further impact of converting assessments from Web to print also meant that navigation of the course would change somewhat. The design blueprints for Educational Psychology and Instructional Media mentioned that a separate booklet for quizzes would be created. Since the Instructional Design course uses a project for a final assessment, the designers adapting the ITMA course did not have to make concessions for proctoring, although the implication for feedback delays did necessitate the decision to disallow students to "redo" their design activities; they would have to move to the next stage without the ability to revise their assignments as is allowed in the ITMA course.

Summary

Students in the IT Clinic participated in three activities designed to prepare them for course redesign: completion of a context analysis, analysis of existing courses, and creation of a design blueprints. In the first activity, the Malawian students presented contextual concerns. The concerns included culture, language, gender, politics, design, and communication. Of these six areas, designers would need to pay particular attention to how examples presented in the original course material would be interpreted in the cultural context of Malawi. Additionally, barriers to understanding caused by differences in North American and British English would also have to be removed. Communication issues, another concern raised by the context analysis, would have to be resolved. Reliable postal services and phone service (including Internet connections) are found across the United States, but not in Malawi. Course designers would have to work with the knowledge that communication between instructors and students might not always be easy. The political issues raised in the context analysis largely concerned administrative issues that no one at Virginia Tech could resolve. The political issues remained largely unresolved through the semester although design efforts forged ahead.

In their analysis of courses, students discovered that each course presented its own set of challenges for redesign. The Educational Psychology course, with its heavy reliance on multimedia elements, would have to be adapted in such a way that the richness of the content stayed. The Instructional Design course, instructors who administrated the course would have to be most concerned with how to receive assignments and send feedback. The on-line ID course, which places heavy emphasis on the construction of an instructional product, uses constant feedback via the Web. In a print-based mode, a new approach would have to be adopted. The Instructional Media course presented two challenges to the design team. The on-line version of the course does not give many "lecture" notes on-line. Instead, the site basically points learners to web-based resources, some of which are created by the publisher of the course text. Second, designers would have to deal with chapters about technologies that are not currently used in secondary schools in Malawi. In all three courses, the question of how to obtain textbooks for use in Malawi was a question on the minds of all designers. One student asked for and received permission to copy a textbook from the book's publisher. The books for the other courses would be a bit more problematic, although some felt like a small batch could be purchased and placed in Mzuzu University's library.

For their final activity, each team of three students had to develop an instructional design blueprint. The document they created was to guide their efforts as they redesigned the ITMA courses. Discussing elements of design, the blueprints laid out tentative plans about how the

designers would account for learner needs, instructional goals, objectives, instructional strategies, media, and assessment. The document provided an overview of possible adaptations. In the next section, the actual changes made to the ITMA courses are described.

Description of Changes to the ITMA Courses

The focus of this case study centers around the considerations that influenced changes resulting from the redesign process. Such a focus calls for an examination on factors leading to changes, as have been examined, but also a description of the changes themselves. This section examines various ways that the redesigned courses actually differ from their ITMA counterparts. To elucidate the changes, the organizational substructure in this section focuses on layers or levels of change. Examining the adaptation efforts in regard to course content, I have classified the changes into four layers: layout, language, logistics, and content.

Perspectives formed by the reviewers during the formative evaluation stage, which occurred very close to the end of the semester, are also included in the description of changes for each course. Site maps of the ITMA courses, table of contents for the redesigned, print-based courses, and example lesson from each are found in Appendices L through Q. Since this section will make frequent references to the original ITMA courses and redesigned ITMA courses, I use the following convention to refer to them when multiple uses would become burdensome:

ED-W : Educational Psychology – Web

ED-P: Educational Psychology – Print

DS-W: Instructional Design – Web

DS-P: Instructional Design – Print

MD-W: Instructional Media - Web

MD-P: Instructional Media - Print

Layers of Change Explained

Layer One: Layout. Layout refers to the physical appearance or organization of materials. Generally speaking, there were not dramatic changes to the layout for the print-based courses. The IT Clinic course itself left groups to develop their own layout and guides for developing print-based material were not distributed (i.e., Aitchison & Aitchison, 1987; Hartley, 1996; Meacham & Evans, 1989; E.S. Smith, 1994). Therefore, visual elements related to print-based layout – such as headings, font type and size, outline, table of contents, and so on – were not topics for conversation in the class meetings, design blueprints, design journals, or in interviews. Additionally, there was no talk about how layout decisions would affect the logistics of reproducing material – the only concern being that additional web-based material could not be printed due to sheer volume. For instance, a 12-point font is easy to read (Chandler, 2001; Hartley, 1996; Meacham, 1982), but a 10-point font takes up less space and because the number of pages would likely be reduced, course materials would cheaper to reproduce. An additional consideration concerns paper size. In North America, documents are printed on 8.5” x 11” pieces of paper. In Malawi, the standard paper, or A4, is 210mm x 297mm, a size just narrower and just longer than that used in the U.S.. Paper size seems to be an important contextual consideration in layout, but a discussion of challenges related to it were neither recorded nor observed.

Visual design theory and its relation to layout did not play any significant role in discussions in or among groups. Rather, layout issues showed two main areas of departure: organization of introductory materials and placement of quizzes or tests.

Layer Two: Language. The second layer changes are somewhat less obvious, but upon closer inspection, changes to language are not difficult to detect. The Layer Two changes concern the conversion of spelling to British formats, changing "Americanisms" into idioms or phrases better understood in Malawi (i.e., gas to petrol), use of metric terms rather than English units, and converting contractions into their whole word equivalents. The overall syntactic structure of sentences did not change nor was there discussion of the type that one might find in a linguistics classroom with debate of deep structures or semantics. The class had already been alerted to differences in English terms after the "invigilator" incident. Thus, the teams worked on a pragmatic level, changing words and spellings as needed. No class discussion or journal entry documented angst among the designers over the theoretical ramifications of language, although Kondwani, himself a lecturer in language in linguistics, noted some interest in the topic (INT/35/¶234).

Layer Three: Logistics. Layer Three changes involve adaptation of logistics. Specifically, designers had to consider the impact of a different delivery mechanism and what it meant for course administration. When a class goes from the lecture hall to a distance format, instructors must develop a new way of dealing with Internet-based interaction (Khan, 1997; Simonson et al., 2000; Tait & Mills, 1999; Willis, 1993). When a course returns to a print based form, the same considerations must be taken into account: how will students get course materials or access university resources, how and when students and instructors communicate, how learners will be evaluated and how they will evaluate the course, and so on. One of the difficulties that teams encountered as they designed the modules was due to the fact that not all of the logistical realities were readily known, creating an uneasiness among both the students involved in redesign and the professors who facilitated the course (INT/8; INT/12; INT/16; INT/43; JRNL/25). The tentative plans – some of which were speculative based on the original agreement – thus formed a context of their own, existing between the "here and now" and the "what could possibly be." As can be expected in such a framework, content in the redesigned courses directly related to logistics was not consistent across courses and in all likelihood would change a good deal once the courses were actually exported to Malawi. The adaptation of delivery mechanism already established (all courses will be print-based), logistical changes are described by looking at two aspects: assessments and feedback.

Layer Four: Content. The final layer of change has to do with modifications to course content, mainly by way of substituting or modifying examples used to explicate ideas. Responding to which aspect of the redesign process was the most challenging, Alex acknowledged that the content concerns presented some difficulties:

> Alex: I think one thing was... the way the course was designed first, I think it is in the context whereby, everything that maybe is given, most of the examples are American right, and the assumption again was, the module that I was working on…two modules were considering computers, examples were given for computers, and if you give a machine, maybe the example of the machine where a computer is mentioned, and maybe the web page is mentioned somewhere in there, the assumption was that maybe people have a background knowledge about all these things. So the Malawi context of that was not actually possible. We had to actually change those and then put in an example, something which conveys the same information but maybe different kind of reference, example. I feel that was most of the reason. [INT/4/¶125]

Not all designers were Malawian, so their own understanding about which examples needed change or modification was sometimes prompted by their Malawian colleagues or by the Malawian reviewers(INT/8/¶64). Examples of content changes cannot be exhaustive due to space limitations, so examples have been selected for their uniqueness and contrast.

Changes to Educational Psychology

Layout. Of the three redesigned courses, the Educational Psychology final packet more closely resembles a print-based packet than do the other courses. Although it lacks a table of contents, ED-P packet uses large, bold headings at the top of pages and each section has its own page (Course Information, Overview, Content Outline, and so on). The model for a crisply-organized print packet is set by ED-W itself, which has a highly navigable structure and easy-to-read web pages that make good use of white space. The table of contents for ED-P shows that it closely parallels the content of ED-W (see Appendices L and M). One can see that students going through either course have clear instructions about proceeding through the instruction.

The layout of the individual modules in ED-P differ from ED-W in that ED-W modules each contain a series of links to multimedia files. The design team for ED-P replaced the links with the text from the audio file. The formative assessment for each module, a link to a data-driven form that provides immediate feedback, instead appears in text format at the end of the corresponding module. The feedback is on a separate sheet placed one page behind the assessment questions. The interactive activity in ED-W, often in the form of a Shockwave plug-in, is not duplicated for ED-P.

Language. One of the most obvious language differences between the two courses is in the wording of the module objectives. The design team decided that rather than begin every objective with “The student will be able to,” as it is in ED-W, they created a sentence that introduced all objectives with the same words. The objectives themselves start with the measurable action (i.e., “Discuss the various assumptions…” or “Explain the basic model...”). Where the ED-W course had two behaviors in one objective, the design team created two separate objectives for clarity, a suggestion arising from the formative assessment.

Overall, language changes in ED-P are not dramatic, but there are some interesting examples. In Module 3 of ED-W, a sentence reads, “For example, if your friend or lover wears a particular perfume or cologne, then often when you smell that perfume or cologne when in the mall you will immediately think of your friend or lover.” The ED-P version, given its different context, replaces “mall” with the word “shopping centre,” as “mall” is not a term used in Malawi. In another example, the text reads, “Michael, a fourth grader, is reading aloud to the class.” To conform to the Malawian educational system, the text has been changed to read, “Michael, a pupil in standard four, is reading aloud to the class.” It is interesting that the name of the child stays the same, but as some Malawian names are of English origin, it is not entirely out of place. Other examples of changes to language include attempts to make spelling conform to British English. For example, “behavior” is replaces “behaviour” in ED-P. I use the word “attempts” because there is some inconsistency; some others are discussed at the end of this section.

Another area where language changes is in the transcription of audio files. The ED-W version contains narrated slide shows with the professor for the course reading his notes. But instead of reading straight from the page, he takes a conversational tone that would be familiar to students whose first language is English. Students taking ED-W might hear the professor say, “Today we’re going to talk about….” Students using the print version read a more formal version, “Today we are going to talk about….” The change of contractions is fairly consistent throughout the text and it changes the tone from a personal, conversational approach to one that is more formal. The Malawian students noted specifically in their context analysis (ITCA/15) that contractions are not a part of their typical speech and are not often heard in the instructional setting.

Herbert mentioned that the language changes were not easy for his group:

Researcher: You mentioned before that it is not easy to take materials that have been online and develop them for print, you mentioned, I think you said the word "It's been hard," what has been the hardest part of doing that?

Herbert: One, the language. Especially with educational psychology because most of the examples in the material, it was actually, first it was an audio recording like somebody saying, "today we are going to do this in this," so it was more somebody like teaching, a know, a person who is far away but assuming as if they were there. Now we had to change that into print so we couldn't use audio, we had to change the language. Even most of the language had been changed, you know, you could actually see that some of the text is oral as opposed to written. So we had to actually look at that and apart from looking at educational psychology we also had to put in English language, grammar and all that, so to change that...

Researcher: You mean British...

Herbert: Yes, British [laughter]. Yes we had to change from American English to British, from spoken to written, that was hard. (INT/23/¶124-130)

Not all informal speech was taken out, as Alex explains,

> We left some oral language unchanged for we though it brought the learner closer to the instructor who will be at a distance. The learner feels the instructor is talking to him directly. However, we revised some obvious mannerisms. (JRNL/21/14)

Zhen Gao noted in her design journal the importance of trying to establish rapport with students by using a more conversational tone,

> We believe that since this course will be delivered by print-based distance format, most of learners are separated from each other and from instructors, in order to minimize the effects of psychological distance; we tried to create a rapport learning environment using the spoken language to write the course content. (JRNL/29/11)

Their explanations of the decisions to leave some language as-is thus explains some of the grammatical and linguistic inconsistencies that one can observe in the final draft of materials.

Logistics. The types of assignments created for ED-W did not change in ED-P, although the administration of quizzes had to change given the printed format. Students enrolled in either version of the course would have to do application reports, chapter summaries, formative assessments, and a final exam. One change to the assignments included expanding the word limit of the chapter summaries. Two of the designers, Alex and Herbert, had both taken the ED-W course the previous summer while in Malawi doing the needs assessment data collection. In their experience, they felt that the strict, 25 word limit to summarize an entire chapter was entirely too hard (O/16), so they expanded it to a 50 word limit.

Submissions of the formative assessments in ED-W are automatically graded, but the designers knew that context in Malawi dictates that students could not submit their end-of-module formative evaluations to be graded – the postal system was simply too slow. The compromise the team reached was to keep the short, formative assessments as part of the instruction, but it became more of a student self-check rather than a graded assignment as in ED-W. However, knowing that they wanted to keep students accountable for what they had learned, the team proposed four unit tests (ED-W has none). Although they were not developed by the end of the semester, designers write in the course instructions that summative assessments would be located in the course materials and that they would have to be sent in at the given intervals (dates to be determined). There is no description of how the final exam, a comprehensive test with questions solely based on the textbook, would be administered.

Another area of concern to the team involved the logistics of feedback. Herbert and Zhen Gao recognized the fact that feedback delivered via the computer would be faster, but doing so might not be possible. Upon being asked what practical influences guided her decision making process through as she redesigned the course, Gao said,

> When we design the class I think about how they communicate, you can't just throw everything to students and then let them do it. It's hard for them, I have question, I mail it to you, that may be take one week... so I think that's most important part is communicate, because students cannot get instant feedback from instructor. (INT/43/¶182)

Students and course administrators will have to rely on the postal service, the efficiency of which would determine pace (ITCA/11/¶13). One suggestion was for the team to do periodic site visits to outlying areas in order to talk with the students, but "the effectiveness of the system would depend on the geographical distribution of the students" (ITCA/11/¶13). Decisions about how and when instructors and students would communicate were not decided in the IT Clinic; the Malawians realized they would have to wait to return before such decisions could be finalized.

Content. Taken on the whole, there were not a great deal of changes to the content of the course. The modules follow nearly the exact pattern in ED-P as they do in ED-W, the only difference being that the ED-W course calls its course introduction "Module 1" and the ED-P course starting module numbers when actual instruction begins. As noted in the discussion about changes to layout, designers had to remove the links the multimedia elements that appear in the ED-W version. But although the links were removed, the content behind the links was not. Making this process easier was the fact that the original course designer has made allowances for those who might have technical difficulty accessing content. He therefore included links for students to access "text and images only" or "text only" if they could not view the Quicktime slideshow. The team that adapted the instruction included the text and images in a section they labeled "Supplementary Notes." The formative assessment, a short multiple choice quiz, was moved to the final pages of the module. The element not included in the print version was the interactive activity created by the professor. In ED-W, the activity appears as Macromedia Shockwave file.

Other content changes make clear the fact that learners are coming from two different backgrounds. In a chapter on self-efficacy, ED-W uses a map of the United States in an activity that asks learners to name the states. Even though Malawians would likely recognize the shape of the U.S., the activity would be much more relevant if they saw a map with which they are more familiar. The designers replaced the U.S. map with a map of the African continent. Changes like this occur throughout the instruction, although some images that are decidedly North American (a lipstick advertisement with a Caucasian woman) still appear. In their final group presentation, Zhen Gao explained that reviewers had questioned the inclusion of a photo of an Asian male, suggesting perhaps it should be changed to a photo of a Malawian. However, she said that the group discussed this and they decided that since they wanted the instruction to be inclusive of many types of people, the picture would remain in place (O/25/¶12). Alex remarked "What is important here is that examples whether or not of Malawi origin should help communicate the ideas to learners" (JRNL/25/14).

Formative evaluation feedback. Two Malawian students enrolled in the doctoral program for teacher education at Virginia Tech gave the design team feedback on four modules. Following an evaluation rubric created by the designers themselves, the reviewers answered specific questions related to various pieces of the materials. Besides being able to mark "Yes" or "No" in response to a question on the evaluation form, reviewers were also allowed to write

open-ended comments. In general, reviewers gave positive feedback about the modules. Both agreed about a need for closer attention to two areas: inclusion of culturally appropriate examples and means of communication with students.

In response to a rubric question that asked, “Are examples use in the materials familiar in the Malawian context,” one reviewer wrote, “Need to think of examples relevant to Malawi setting – e.g., a classroom with carpet and pillows is not of Malawi nature” (EVAL/2/2). The other reviewer agreed (EVAL/1/2), and made comments on the materials themselves. For one module, the reviewer called attention to a map of the United States used in an activity about self-efficacy, stating that reviewers could use a map of Malawi. In the final draft, designers used a black and white map of the African continent.

Both reviewers also commented about evaluation procedures. The evaluation form asked questions such as “Are instructions for the assessment activities clear?” and “Are students’ evaluation procedures well stipulated?”. In response to these questions, the reviewers answered “Yes,” but one advised,

> When you post materials to students remember they might receive them at different times or some of them getting lost on their way to or from the university because of different delivery services. Also consider examination centers to minimize transport and accommodation expenses on the part of students. (EVAL/2/1)

The second reviewer recognized the tenuous nature of the postal system in Malawi as well, asking the designers, “How will you treat late assignments considering the geographical position of some secondary schools?” (EVAL/1/3).

The design group did not meet with reviewers but received the feedback on the evaluation forms. Meeting shortly before the final draft of their materials were due, the team decided to make some changes yet keep some materials as they were. There were some points of disagreement with a couple of the reviewers’ comments, but the group agreed that the evaluation was beneficial (JRNL/21/14; JRNL/29/11). One designer concluded, “I have to point it here that this review was very helpful for it offered insight to many things that we discovered needed to be revision. If it were not for this review many things that required revision could have been left untackled” (JRNL/25/14)

Changes to Instructional Design

Layout. The group that adapted the ID course did not include any instructions or syllabus materials in the final printed version of the course. The DS-W introductory materials are not extensive themselves yet they include a four-page syllabus and two-page “Introduction to Instructional Design” overview. The lack of introductory material appears to have not been an oversight, but the result of a lack of time to develop materials. In the design blueprint, the group proposed to create a spiral bound course pack that included reflection questions and answers to accompany reading assignments, an instructor course pack to guide delivery and formative evaluation, and a CD-ROM with student and instructor materials (ITCA/1/¶85). Only the course content materials were submitted at the end of the semester. Based on what I observed over the semester and based on the emphasis in the design journals of the group members, the focus was always situated on the content of the courses as it was clear from group conversations in class that logistical issues were in fact unclear. Justina, the Malawian group member, could not provide any logistics details with certainty (O/22), nor could her colleagues from Mzuzu. The student assessment in the Instructional Design course, a design project, stayed the same for both DS-W and DS-P.

A layout concern unique to web-to-print conversion encompasses the use of images. On the Internet, where one views content on a computer screen, the resolution of graphics and

pictures need be only as good as the highest resolution of the monitor. The resolutions differ for the PC and Macintosh screens. Both resolutions are far below that required for print, though, so attempts to print low-resolution graphics onto paper results in images that are not crisp, but fuzzy. For individual use, such an outcome may not be troublesome. However, in order to ensure that mass reproduction of course materials contains the best, sharpest graphics, designers had to retrieve the original graphics from the course author. A second problem that arises is the image size on a disk drive. Low resolution images have a small file size (generally 30 to 60 kilobytes), while high resolution images for printing can be as large as two megabytes each. On a CD-ROM, this issue of size is generally not a problem. Should the course ever be distributed on floppy disks, the size would definitely be a problem. In the case of DS-P, the design team obtained and saved the high resolution images on a CD-ROM and used them when printing out their final version.

Language. Like the adapted Educational Psychology course, DS-P also includes minor grammatical modifications, such as changing contractions and making minor wording changes. For example, “chalk board” becomes “board.” Because each team member completed the redesign of selected portions of the instructional design course, the consistency of the changes is somewhat uneven. But even with a single lesson, inconsistencies in language exist. Where the some parts of a lesson may show a change of “you’ve” to “you have,” another part of the lesson will contain the original words “let’s” or “don’t.”

Anthony and Jonathan, two U.S. citizens on the DS-P redesign team, noted that making changes to language was difficult. They often consulted Justina, their Malawian team member. An example of this type of exchange is seen the exchange of e-mail (put in conversation form) between Justina and Anthony:

> Anthony: Hi. Would the terminology "grow up" make sense to Malawians meaning "reached adulthood"?
>
> Justina: You mean puberty?
>
> Anthony: No. That's not what I mean. It is less technical than that. I'll change the wording. Thanks.

Anthony mentioned in an interview that he was particularly careful about paying attention to the wording, trying to ensure that contractions were spelled out. But even some words he assumed were fine were called into question by his Malawian teammate when she reviewed some of his materials. Her suggestions made him become even more keen to notice words of a technical nature (INT/8/¶196). Jonathan also noted some difficulty with knowing “which words work and which words don’t” (JRNL/25/4). An interesting outcome of Anthony’s and Jonathan’s struggles to use appropriate wording was the way it made their Malawian colleague feel. Rather than being put off by the questions, Justina expressed it gave her a feeling of importance to be the expert in the group (JRNL/26/11). The group dynamic, part of the context in which the product was designed, is described in the concluding portion of this chapter.

Logistics. Due to a lack of a syllabus in the final design product, it is difficult to assess specific plans for DS-P. Unlike the two other courses being redesigned, neither the DS-W course nor the print-based version contains a final written exam based on textbook content. The course material makes it clear that the major assessment is a self-generated instructional design project built over a period of weeks. This is different from the assignment in DS-W as the project is in fact a plan that students will implement in a later course. Students enrolled in the proposed B.A. honors program would not have a follow-up course after instructional design as the ITMA students do, so the production aspect of design would have to be included in DS-P. Deciding to keep the same project was a matter of some debate for the team. Arguments about

whether to keep the project or modify it largely centered around logistical elements of availability of instructor time and feasibility of communication.

The team debated amongst themselves the possibility of travel to and from proposed (hypothetical) distance education centers. The decision for the Mzuzu faculty to travel was dismissed to account for the fact that all of them would be working in their regular duties when they returned home (O/22; JRNL/22/7). They would not have time to travel. Justina, not completely at peace with this decision, wrote,

> Although this was the decision we were to abide by, I personally feel that travelling [sic] to satellite points would be more convenient than waiting until people get their things posted. The limitation of postal services highlighted in the needs assessment report cannot be dealt with completely. Put short, there may be need for travelling once in a while, as need arises (JRNL/22/7).

Her comments clearly show that communication with students would be very important. Even members of the IT Clinic not involved with the adaptation of Instructional Design recognized that feedback was an important part of the ID course, as many documented in the analyses they completed at the beginning of the semester. Still, the details of how the course would be implemented at Mzuzu remained unclear even at the end of the semester. Because the logistics of receiving parts of students' projects and sending regular feedback was unclear, the instructions in the DS-P were also ambiguous. Whereas students in the DS-W course are instructed to upload their assignments via the On-line Student Interface (a web page that serves as an interface to a database) and given a link to the interface at the end of each lesson, instructions in DS-P are, "Your instructor will provide you with guidelines for submitting your work to be graded."

Content. At the beginning of the redesign process, the DS-P team believed that they might not have access to the course textbook by Dick, Carey and Carey (2001). Therefore, they thought they might have to do design from the ground-up, finding and using non-copyright materials where they could. Anthony's initiative to contact the publisher of the course textbook and ask for permission to make photocopies of the text for use in Malawi allowed them to refocus on the redesign process.

Instructional content in DS-P is nearly the same as that found in the web-based course (see Appendices N and O to compare), but there are a few noteworthy departures. In the first change, designers eliminated an introductory piece titled "Introduction to Instructional Design." The introduction in DS-W makes reference to modules (courses) previously taken by ITMA students. Like other parts of the DS-W text that harkens back to ITMA-specific curriculum, the redesign team eliminated references since the B.A. honors program would not be following the same sequence of instruction.

Other clear examples of changes to content come by way of culturally relevant examples. Below are two instances showing how content changed:

From Lesson 8: ITMA Course

> For example, if students are studying the U.S.Constitution, should they be able to recite the Preamble, or should they be able to state the main ideas? If students know which one they can better attend to the accompanying instruction.

From Lesson 8: Redesigned Course

For example, if students are studying the Constitution of Malawi, should they be able to recite it, or should they be able to state the main ideas? If students know which one they can better attend to the accompanying instruction.

From Lesson 2: ITMA Course

Critical-incident need - Critical-incident needs emerge when failures that may be rare but have significant consequences happen. Shootings in Columbine High and other schools prompted security measures to be taken in public schools as well as education on violence to be received public. Critical incident needs are identified by analyzing potential problems. For example, chemical plants and petroleum refineries often develop employee training programs for handling emergencies such as fires, explosions, or spills. Other critical incident needs are identified by asking “what” questions; for example, “What would happen if the main computer or phone system failed?”

From Lesson 2: Redesigned Course

Critical-incident need - Critical-incident needs emerge when failures that may be rare but have significant consequences happen. Black outs in Malawi prompted increased production of candles and other alternative lighting sources.. For example, chemical plants and petroleum refineries often develop employee training programs for handling emergencies such as fires, explosions, or spills. Other critical incident needs are identified by asking “what if”questions; for example, “What would happen if there was draught?”

In other places where an example in the on-line course is not at all similar to anything in the Malawian context, it has been removed entirely (as in one case describing the balancing of a checkbook).

Another notable revision to content is found in the first lesson’s design activities section. The DS-W instructions asks students to answer a few questions about “everyday objects” or “real world systems.” Rather than rely on the learner’s ability to do this, Anthony (in charge of redesigning Lesson 1) opted to include examples of objects and systems that would be familiar to people living and working in sub-Saharan Africa (both examples are from Kenya). The inclusion of this expanded text in DS-W demonstrates the differences between the two target groups of learners. The second group, having had little or no exposure to design principles, will benefit from the clear, relevant examples. The lesson became a model of the principles described in the course itself. As Jonathan said, redesigning instructional design is “a mirror within a mirror” (INT/30/¶86).

The greatest change to content in DS-P results from the team’s decision to make the course project-oriented. The description of changes to logistics noted that the designers agreed to have students build an actual design project even though the feedback mechanism needed to guide learners along the way was not clear. The change results from the difference in curriculum. Students in ITMA use DS-W in order to create a design plan that they later implement when they take a multimedia course. Learners in DS-P, under a different sequence, would need to create a design product for assessment within the course itself, not only the plan. A good deal of debate surrounded the exact nature of the project; for nearly three weeks the designers went back and forth over the options to have learners create a project of their own design or where all students would design the same thing. Either choice has an impact on logistics and pedagogy. Based partly on the advice of the subject matter expert (also a professor in the IT Clinic), the group opted for unique projects. In order to guide students through the process of development, the designers expanded Lesson 9 on development. The

expanded DS-P materials give learners an overview of the development process, list components of an instructional package, and provides guidelines for developing visual materials.

Formative evaluation feedback. The design team for DS-P created a short rubric for two evaluators and provided them with three completed lessons to review. The evaluation form included six questions:

1. Can students in Malawi use this lesson without help?
2. Would students want to learn this content?
3. Were the directions/questions/lessons clear?
4. Were the examples used easy to understand and relevant?
5. If you could change one thing about this lesson, what would it be?
6. Is there any material you think needs to be added or deleted to make this lesson more understandable?

Questions 1-4 allowed a “Yes” or “No” response and allowed reviewers to write in open-ended comments. The design team received a “Yes” in all cases, but the reviewers took time to make comments leading to some revisions.

The inclusion of more legible graphics and clear headings and labels was one layout concern arising from the formative evaluation, but most comments were directed at the content of the materials. Both reviewers took issue with the Kenyan examples, saying that at least one should be Malawian in nature. The examples were not changed, however, as the design team felt that changing real-life examples was not appropriate. One reviewer conceded in his comments that the non-Malawian examples “do not take away from what is provided in any case” (EVAL/3). Interestingly, the same reviewer also noted that an example referring to Washington, DC and New York City should be changed to Malawian cities. This same example had originally been “OK’d” by the Malawian designer who felt that a learner was not required to know where the cities were located and therefore the example could include any two cities. Justina reacted to the suggestion by noting that first-degree holders in Malawi (people with a bachelor’s degree) have often seen non-Malawian examples because the texts they use are usually authored in the United Kingdom or the U.S.

> …we have used books that are not Malawian all throughout. And most of the examples we get are not Malawian. … Now it wouldn't be a big surprise for somebody to see an example which is coming from America. I disagreed with some of the suggestions they [the reviewers] made because if for example somebody says, "a distance from Washington to New York is so long that nobody can walk," I mean it should click in somebody's mind that Washington and New York are not close. They may not necessarily have to know where Washington is and where New York is, you know, to appreciate that fact. So with such an example we should give cities in Malawi. Maybe for somebody who is not literate, it may be important. But for somebody who has gone all the way to a first-degree, I don't think that is a major issue. (INT/32/¶198)

Despite the claim that the target audience would not be bothered by the Washington/New York example, the group changed the names to Lilongwe and Blantyre in the final materials.

Changes to Instructional Media

Layout. Content of the on-line and print versions of Instructional Media is, like in the other courses, the same or nearly the same (see Appendices P and Q). The course information about the textbook, yet it is clear from the contents that learners will be using the same textbook

that ITMA learners use. Unlike the on-line version, the MD-P course is divided into three parts. The first parts include the Learner's Guidebook and Learner's Practice Test Book. These were designed to be given to the individual learner. A third booklet, Chapter Tests, would only be distributed at a hypothetical testing center. Learners using the Guidebook would find very much the same layout as if they were on-line, including end-of-section boxes that include grading criteria. The MD-P course includes a syllabus the mirrors the on-line version except in content details (due dates, for instance). All pages of the course run together, meaning that there is no physical separation between chapters, only a graphic separation exists. The Practice Test Book also does not create a physical separation between chapters. Instead, designers used bold or enlarged fonts to separate the practice quizzes of one chapter from the next. The answers to the all the practice assessments, comprised of either True/False or multiple choice questions are located at the end of the booklet. The Chapter Tests booklet does not contain answers and, like the other two booklets, makes only a graphic separation between tests, meaning that the Chapter One test is immediately followed by the Chapter Two test on the same page, a pattern that continues throughout the book. The group met weekly as a team and revised materials during the meetings, resulting in a consistency to the overall look of the course.

Language. With much less text in the on-line version, textual revisions were limited. Where changes to language do occur, they change simple values. For example, references to "K-12" education are changed to the Malawian version, "Standards 1-8" or "Forms 1-4." One interesting change is found among the Lesson Six multiple choice questions. One response states, "description of how the tax dollar is allocated among various government agencies." The redesigned response reads "tax kwacha" (the kwacha being Malawi's currency) instead of tax dollar. It seems in this instance that a replacement of an idea, not just the word, was needed. Even in instances where a school media center or school media specialist are referred to, there is no change. Whereas designers in ED-P had been sure to change the English measurement system to a metric system, MD-P designers left "inches" and "feet" unconverted.

Logistics. Submitting assignments, quizzes, and tests for MD-W is done entirely on-line. The redesign of the course meant that all links pointing students to web-based tools for submission or assessment had to be removed or reconfigured. In the case of formative quizzes (a short true/false quiz and a short multiple-choice quiz), learners are directed to their Practice Test Book materials. For the chapter tests, learners are instructed that they will take the exam at a test center, but the details of the center are not included in the materials. Like students in the on-line course, learners have to complete one integration activity. When they finish, they are instructed to mail it to their instructors. There is no indication of how quickly learners will receive feedback on assignments or tests. Since the Practice Test Book includes answers to the two short quizzes for each lesson, students can check their own comprehension.

Content. The very idea that a course like Instructional Media could be made relevant to Malawian educators is questionable. The literature review describes Malawian schools and universities, neither of which have more than basic educational technologies for faculty use. So, when a course describes student-made videos, use of instructional software in the classroom, Internet-based lessons, etc., the ideas cannot be demonstrated to the majority of Malawian educators even at the university level. One member of the IT Clinic, in her assessment of the modules, wrote, "It is impossible to teach students select, utilize, and integrate media and technology into lesson plans and the instructional design process if students don't have access to a certain media" (JRNL/29/13).

Despite the differences in contexts, content for MD-P stayed almost entirely the same. The only notable changes to content include the deletion of integration activities that make reference to web-based resources. In only one instance was an integration activity replaced with one that specifically asks learners to consider how a technology could be used in a Malawian

classroom (Lesson 8). Where the instructional text in MD-W points learners to a link, the MD-P course tells them where to find the same information in their book. One lesson on the Internet and Intranets does not even change an integration activity that asks students to “Prepare a position paper on the use of the World Wide Web for education and training now and in the future.” Given that one of the problematic questions on the needs assessment survey had to do with knowledge of the Internet and computers, one has reason to suspect that prospective Malawian learners may not have much general knowledge about the Web.

The lack of change to the course was surprising to some (INT/12/¶36; INT/16/¶77). When asked how the redesign process differed from what he expected, Professor Goodman remarked:

> I would have guessed that the instructional media course, that they wouldn't have been as content to go with the materials that they had there, that they would have been more in terms of creating their own or at least modifying something from the book or attempted to pursue it and see if they could make changes to it. I think that's a tough course as a distance learner because you're relying almost totally on what they get from the book to be able to do anything else, so you're missing out on a lot of what you would normally get from an instructor unless the instructor just [unclear] the textbook. (INT/16/¶77)

Professor Black stated that her misgivings about the lack of change was somewhat assuaged by the fact that not only had Malawians participated in the redesign, but the course was also reviewed by two Malawian students outside the instructional design program (INT/12/¶36).

As Black stated, the course was chosen by the Malawian class members and there was no protest from them that it had no relevance to Malawi. On the contrary, the design team justified its use. Mi Ling, the non-Malawian member of the group, also had questions about its applicability. Janet told her that since most of the book was theoretical, the students could use it and thereby acquaint themselves with cutting edge technology (ITC/9). Janet expressed the same opinion in an interview towards the end of the design process:

> *Researcher: Why do you think that course is important for people in Malawi to take?*
>
> Janet: It is important. Even though many schools do not have computers, but there are other types of media that you can use in the classroom which I never thought of using before.
>
> *Researcher: Like what?*
>
> Janet: Like let's say using games to teach mathematics, something like that. Not many teachers know that. (INT/29/¶172-178)

Later, Janet and Kondwani acknowledged that adapting the materials to the context of Malawi was a major challenge (INT/29/¶226; INT/35/¶206) as people do not have the same resources. Janet pointed out that at first her group was considering “foregoing them [technology-based lessons] altogether.” The group then decided the lessons could still benefit learners. It goes beyond the scope of this section, but Janet’s point should be seriously considered. By denying Malawian students the opportunity to learn about educational technologies being used outside the country, or on a very limited basis in the country, they fall further behind in their understanding of technology use. Thus, the digital divide widens.

Formative evaluation feedback. Reviewers for Instructional Media materials were two peers from Malawi, both of whom are enrolled in the teacher education doctoral program. They followed an evaluation rubric designed by the MD-P group. Their rubric, unlike the other two, implemented a Likert-type scale on one page and a place for open-ended comments on a second. The group provided the evaluators with all lessons, formative assessments, and

chapter tests. Both reviewers were satisfied with the three chapters they reviewed, pointing out relatively minor editorial changes and small instances of localization of language (concerning "K-12" schools). Commenting on text found in Lesson 13, one reviewer wrote in the margin of the evaluation materials, "I am not sure of this in the Malawian context" (EVAL/6). The designers later removed the two words he had underlined and the text no longer asserted that technology was "less expensive."

Summary

Designers relied on information gathered in the needs assessment report and contextual perspectives about Malawi in order to guide the adaptation efforts. The process of redesign created changes to ITMA courses in four areas: layout, language, logistics, and content. Overall, there was little change in regard to layout, language, or content. Except for a reshuffling of some introductory material or formative assessment items, the layout stayed almost the same for the on-line and print-based courses. The Educational Psychology course shows the most change in regard to layout because the original course material includes a number of multimedia elements that were transcribed into text or left out entirely. With respect to language, most of the changes were minor or editorial in nature. Although the context analysis suggested that contractions should be spelled out, there is an inconsistency in and between courses. Some words with distinctly North American connotations were also changed to better fit the Malawian context. A challenge faced by all design teams was how they would adapt content for the Malawi. Instructional text changed little, but ITMA courses use a number of examples that refer to U.S.-based places or phenomenon. The redesigned versions of Educational Psychology and Instructional Design course contain the clearest examples of contextual influence. The biggest departure from the original courses is in the area logistics. The changes are easily accounted for – ITMA materials are web-based and the adapted courses will be distributed via print. The designers were in the position of not knowing all the details related to course distribution or course administration in Malawi. Since the program was in its very early stages, many details related to administration were still being negotiated months after the case study data collected ended. Still, designers made many concessions to the print-based format. Instructions, even though they are ambiguous in places, demonstrate a system that will rely either on face-to-face contact, postal services, or the use of examination centers.

All three courses underwent a formative evaluation process conducted by six Malawian doctoral students enrolled in the teacher education program at Virginia Tech. The reviewers all have a great deal of experience in Malawi's educational system. Teams of two reviewers were asked to evaluate a single course. Each reviewer was provided with his or her own set of materials and an evaluation rubric. The evaluators examined three or four selected modules from the course they were assigned. The reaction to the components was positive and offered the design teams constructive criticism in areas related to contextualization or layout. The designers implemented many suggestions and revised materials before turning in their final products at the end of the semester.

Each design group worked separately, resulting in the fact that changes made to one course are not necessarily consistent with changes made in another. Also, two of the three teams used an approach whereby individuals were assigned specific chapters. This resulted in some inconsistencies within courses as well. A few language elements remained unchanged. Some graphics or textual examples with North American or Western references remained untouched. The unevenness of the re-designed products may have resulted from a combination of lack of communication and lack of time. The possible influence of these elements are described in the next section.

Ownership, Communication, and Time

Design of instructional products never happens in a vacuum, where the sole influences include the needs of the prospective learners, the goals or the desired outcomes, or considerations of when, where, and how the instruction is to be delivered. While all those factors form an important context that shapes design decisions, another equally important context exists. This other context surrounds the design process. A process context can be wide reaching, extending even to the personal lives of the designers themselves. To this point, the process context includes the negotiation of the project and even the structure of the IT Clinic itself. Three additional issues that define the process context include perceptions of ownership, communication among project participants, and the influence of time. These elements are described below. The impact of these issues on redesign is considered in the next chapter.

Perceptions of Ownership

The language used to described the efforts of student participants in this document as consistently been design, redesign, or adaptation. I have often used the word “designer” in reference to individuals working on the project. The choice of words reflects more the students’ professional status as instructional designers than it does how they viewed themselves during the semester. Because they began with courses originally designed by professors – experts in the field of instructional technology or educational psychology – the students indicated that they really felt more like editors than anything else. Outside of minor issues like grammar or word use, some hesitated to change what they felt was sound instruction, as Justina expressed in her journal:

> Sometimes I felt like I was thrown in a lake to learn to swim. I swam of course. Well at least I did not drown. You know this is an immense task I had before me. May be the biggest I had ever had. I have been engaged in similar tasks before but for some reason I felt like “who am I to change some other peoples materials?” you know. It was like tampering with materials you feel are okay but then you have to still change them. So you had to put on a different type of spectacles to be able to see areas, which needed change. This was not easy. (JRNL/26/11)

In an interview, Justina said she felt empowered, despite feeling at times like she was “robbing somebody” (INT/32/¶48). Other students mentioned similar sentiments. Anthony said it felt a bit like he was plagiarizing (O/14/¶40). Jonathan wrote that using other’s materials gave him “a somewhat odd feeling of borrowing someone else’s ideas,” adding that he didn’t want to change good lessons just to change them, thereby making him feel more like a designer (JRNL/25/4).

When asked if “designing from the ground” up was preferable, as opposed to editing other’s materials, participant opinion was mixed. Anthony felt that doing so may have been preferable, perhaps more fun, (INT/8/¶204). Two students pointed out that redesign was better because no one in the class was a subject matter expert (INT/38/¶16; INT/4/¶235). Janet’s idea was a combination of editing and new design. She stated that she would rather have pre-existing materials on which to base any newly designed courses (INT/29/¶434). Professor Black thought it might have been a good idea, perhaps making students focus more intently on stages of instructional design, but acknowledged time was too short (INT/12/¶92). Kondwani also said time would have been a major factor,

> If we had a lot of time, of course it would have been better to have started from the ground, but that would have taken a lllooootttt of time, a lot of time. So I have loved the idea of redesigning it. It was easier. Wwe had something to begin from. Maybe the future as instructional designers we can now start thinking of a course from scratch. (INT/35/¶270).

The lack of time, as noted in the comments of the professor and Kondwani, was indeed a limiting factor and is described in more detail below. Perceptions of ownership may not have had an observable impact on the redesign process, but the fact that such attitudes existed among some students helps describe the context within which the redesign took place.

Communication among Project Participants

Communication among participants varied in intensity and depth depending on the nature of interaction. The most frequent interactions occurred within the design groups themselves – the members of a design team would meet or send e-mails in order to keep abreast of work. The communication within groups was not perfect. Some participants expressed dismay with the lack of responsiveness and/or lack of responsibility of other members in their group.[10] Discussions between groups took place during scheduled IT Clinic class meetings, but not outside of those periods. It was during the first class meetings the negotiation of the redesign project took place (O/17-21). One class member tried to begin discussions among project managers early in the semester, but the meetings did not come to fruition due to scheduling conflicts. Interaction between professors who facilitated the IT Clinic and students took place during class periods and less frequently by e-mail. Professor Goodman had this to say about the communication with students:

> *Researcher: Have you been satisfied with that level of interaction, or would you have preferred more structure?*
>
> Goodman: Well, it depends what point of view you're taking. If you're looking at the course as something where they need to experience having gone through this primarily on their own, recognizing that that's what they're going to be facing, then no I didn't need additional interaction. If you're looking at it as something where they could save some time and trouble, and may be kept more on task early in the process rather than having to face all this near the end, then the answer would be yes. I think they would have benefited and I would have felt more comfortable having more interaction. But I do think that one of the main benefits coming out of the course has to be their ability to do this type of work without that type of assistance and it's critical that they encounter dealing with that, and I think they've done some of that. I think they've run into some issues with people working together and they're going to encounter that. Meeting deadlines, scrambling to meet deadlines, and they're going to deal with that. Looking at things that they didn't anticipate early on, those things are going to come up. I think this group of five when they get back there, having limited exposure to the faculty during the overall development process will end up being a good thing for them. (INT/16/¶59)

It is a sentiment with which another course instructor strongly agreed (INT/10/¶28). Some student participants acknowledged they would have liked to have had more direction or saw value in having pre-existing content ready (INT/38/¶262; INT/29/¶354; INT/4/¶177; INT/23/¶198), although others recognized the value of the laissez-faire approach adopted for the course (INT/35/¶310; INT/43/¶294; INT/32/¶278).

I was not privy to communication between Malawian students and their colleagues at Mzuzu, but I was forwarded e-mail sent by project coordinators at Virginia Tech to their Mzuzu counterparts. During the spring semester, communication between Virginia Tech and Mzuzu University officials about the details of redesign was very limited. However, from the start of the project, the type of communication between the two schools focused on administrative procedures or requests. The details of the day-to-day implementation of the project at Virginia Tech have never been a frequent subject of e-mails or phone calls. Herbert acknowledged that

[10] Corroborating interviews and journal entries are not shown here in order to protect identities.

redesigning the courses while in the United States and the inability to have direct contact with people at Mzuzu made adaptation challenging.

> *Researcher: What have you found to be the most challenging aspects of the instructional technology clinic, itself, the class?*
>
> Herbert: …And the other thing is the actual contextual issues, where you are thinking that maybe this might work in Malawi, this might not work in Malawi, and doing that in another country. It would have been easier if we had been thinking of contextual issues and whatever in Malawi where you have a lot of people that you can actually do consultations and see if one thing would work and another thing would not work. And if this redesigned the course was done, it would have been much, much easier because people would actually sit together and maybe take a week or two and just look at the thing over all. But here there are some limitations that we have, you know the five of us here and thinking of the issues, and having different experiences. I may think of one thing in somebody would think that wouldn't work and whatever, but that has been challenging. It would have been easier actually if it was done in Malawi and then given it a test to the actual students for sometime and then come back again and redesign. Actually I guess that's what we're going to do [referring to the pilot test of materials]. (INT/23/¶222)

Herbert's comments recognize the fact that the process context has a role in redesign. Aside from speculation, however, it is difficult to say how the adaptation efforts would be different had certain exchanges taken place. Concerns about communication may have had some impact on design decisions, but the element of time was widely acknowledged to be the factor that most impacted design efforts.

Influence of Time

The Latin phrase "tempus fugit[11]" is perhaps the best motto for the redesign efforts. A culmination of circumstances limited the time students had to redesign the courses. Time outside class, which was to be used for group meetings, was also limited at times due to student obligations or travel schedules. All told, students had no more than eight weeks to plan, redesign, and assess a three-credit hour course.

From the beginning of the semester, time was thought to be a potential challenge to the design teams (INT/10/¶28). The lack of time impacted the groups' efforts to include certain elements that they might have otherwise added, as each group made clear in their final presentations (O/25). When asked by Professor Black, "If you had all the time you wanted, how would your design decisions change?" (O/25), each group offered different responses. Anthony stated that his group, which adapted Instructional Design, would have produced a slightly different product in that they would have created an instructor's guide. He also indicated that he would have liked the reviewers to have had more time for the formative evaluation and he would have preferred to see an evaluation plan created for the entire Mzuzu distance education program. Jonathan added that the assignment for the course might have different, as the group at one point debated the idea of having future students create courses to be used in the program itself. This was a model employed in Virginia Tech's on-campus ID course. Justina was dismayed that the lack of time meant that they could not develop teacher education courses and thereby meet the demand reported in the needs assessment survey she helped conduct.

Herbert's group, which worked to adapt Educational Psychology, told the class that more time would have allowed them to create more questions for the formative assessment and they

[11] Time flies

would have sought more input from the course creator. Alex added that the validity of the multiple-choice tests may suffer as they did not have time to really examine their contents. Zhen Gao said that they also would have added more activities, as they had to strip many out of the original course as they were multimedia elements.

As for the Instructional Media group, Janet indicated that the lack of time prevented them from changing questions for the end-of-chapter tests. Mi Ling tapped into an issue that had bothered her from the start of the redesign (JRNL/28/3). She stated that she would have liked more time to adapt the content of the textbook to the Malawian context. This is actually a concern shared by Herbert.

> *Researcher: … you have a textbook that designed primarily for an American audience, a national audience and is going to be used as the primary text in a course where the supplementary materials may be Malawian, but the book itself is not. How do you see that interplay there?*
>
> Herbert: OK. I think the redesigning would need more time than we gave it. One of the things is that we don't have books written by Malawians, for Malawians in education. All the books that we use are either written in the [United] States or in the U.K. or somewhere. And the examples are their examples. And one way that we can enrich this course for Malawian context is actually physically look at the book chapter by chapter, look at the examples and explain in our supplementary materials to say that "On page so-and-so there is this example, you can think it this way." So that when they read they will know that when they come to the supplementary materials, they can go back and look at those examples, but that would need more time. (INT/23/¶200-206)

Although it appears that groups accomplished few of their goals in the short period in which they had to complete drafts of redesigned courses, the fact is that a tenable first attempt was finished in the time given to them. Even more interesting is the fact that the groups did this with little guidance from instructional faculty. The students themselves agreed to direction for the project, evaluated existing courses, developed blueprints, and adapted content on a relatively short schedule. Justina's closing comments in her journal offer a positive, yet realistic outlook:

> What matters is, at the end of the day, despite the constraints that were there, groups managed to have their final products ready. I feel that finally we are done! Are we done? No! This is just the beginning of things. As a bunch of Malawians, we have before us a task of transplanting the American tree in Malawi. I know we have good soil, good rains too, I just hope the weeds won't be numerous!!! (JRNL/26/14)

Summary

This chapter presents the findings of the case study as developed through interviews, observations, and written documents. Three contexts emerge from the discussion. The first is the Malawian context, which was shaped through a needs analysis report and context analysis document created by the Malawian participants themselves. The second is the context of the on-line master's degree program, for which a series of instructional technology and related courses have been developed. The third context, called the process context, takes into account the structure of the IT Clinic itself, individual attitudes, and group interaction. The impact of the various aspects of the case on the redesign project are explicated in Chapter Seven, where specific research questions are answered.

CHAPTER SEVEN

Identification of Issues, Implications, and Closing Thoughts

Alex, slowly adding the corn flour to the boiling water, told me that women in Malawi used a slightly different method of making nsima (pronounced “see-ma”). Whereas the men tend to stir it, women tend to pull the water-flour mixture toward the side of the pot with a wide wooden spoon, pressing the nsima against the side, mixing the portion back in, and repeating the process. He used both methods and as the mixture grew thicker, I wondered what other things might be added, since the nsima Alex was stirring still only contained water and corn flour. Kondwani wandered over to see how dinner was coming along. I asked, him “Do you add salt?” He laughed so abruptly and loudly that it was as if I had told a great joke. “Salt to nsima?,” he said at the top of his voice while almost double with laughter, “Ha!…No!… Never! Impossible!” He kept chuckling and announced to others in the room what I had asked and they joined in the laughter – I was laughing too. Part of the reason I asked, though, was based on my observation of the dinner plate preparations of all my Malawian friends. Without fail, they would heavily salt the “relish” (vegetables and meats to be eaten with nsima) they had on their plates. Additionally, I had seen them add salt to store-bought pasta sauce and any number of prepared foods found in the U.S. One time I watched as one Malawian acquaintance shook salt vigorously over a plate of General Tso’s chicken, which already has a month’s worth of the recommended sodium supplement. I nearly got sick watching him (in the end, he could not finish the meal – too salty!). I’m told that basic food in Malawi is somewhat bland and Malawians are simply used to adding salt, which happens to be a very affordable way to make food flavorful. I tried to make it clear to my friends that prepared foods they purchased in stores in the United States or got at restaurants quite typically contained generous amounts of salt. I wanted to make sure my colleagues from Africa avoided early run-ins with high blood pressure! Truthfully, I cannot say that I saw much less salt being used despite my warnings. Instead, I would be reminded every so often of the phrase, “salt in nsima,” which would be followed by a smile.

Course adaptation and redesign is essentially about combining the right ingredients to make learning palatable for prospective learners. The influences that brought about the changes during the adaptation process are explained in this chapter. Starting with an identification of issues, questions posed for this case study are answered, drawing on the findings shared in Chapter Six. Next, implications from the study are discussed by looking at factors to consider in the redesign process and recommendations for future studies. The chapter concludes with some closing thoughts about how the various anecdotes and vignettes shared in this study relate to the larger issues being examined.

Identification of Issues

The central question of this case study was, “Which practical and theoretical considerations influence a team of designers as it adapts a distance education course for their context?” This question was clarified by further questions related to identification of strategies, plans for implementation, and changes to goals. In the following section, I answer each of the research questions by referring back to evidence presented in the Findings chapter and by integrating related literature.

1.) How did the context analysis affect the instructional redesign of the original ITMA courses?

The failure of so many instructional innovations to be adopted is often due, in large part, to a failure of the materials or delivery method to fit the context of the adopting community (Chadwick, 1970; Creed & Perraton, 1999; Ellsworth, 2000b; Ely, 1989; Hawkridge, 2002;

Marchessou, 2000; Rogers, 1995; Shrestha, 1997). Pérez (1997) offers the following admonition:

> Persisting to import ideas that are not locally developed should be carefully analyzed. This is not because it is imperative to scrutinize them, but because basic conceptual arguments which support the practice of distance education can and should be developed from within. (p. 152)

In a similar vein, Creed and Perraton (1999), who offer a number of recommendations concerning the training of distance learning material authors, write:

> Imported and imposed models of ODL [open and distance learning] training and course design have sometimes been inappropriate to the *socio-cultural* context in which the course is situated. Course developers need the opportunity to consider how aspects of their and their learners' immediate social context could be accounted for within the writing and design principles of a course. (p. 12)

It is therefore imperative that any activity related to the development of distance learning courses and/or programs make an explicit overture to the role of contextual elements.

One of the theoretical perspectives for this study is based on the principle that context is an important part of the instructional design process (Tessmer, 1990; Tessmer & Harris, 1992; Tessmer & Richey, 1997). Tessmer and Richey (1997) point out that the consideration of context is often missing from the design process. The authors encourage designers to consider three contexts: orienting, instructional, and transfer. Each of these contexts relates to the learning environment. Tessmer and Richey (1997) and Dean (1994) provide guidelines for context analysis. Although the participants in the I.T. Clinic did not use these guidelines, the data out of the needs assessment report and the shorter context analysis document are very similar to what the aforementioned guidelines would produce. Both documents created by the Malawians contained information that all designers used as they revised the ITMA course content. An interesting aspect of this case is the fact that the context analysis was a living document. The Malawian designers themselves had personal knowledge about context and could be asked to provide information above and beyond what was outlined in the reports.

Information from the needs analysis report had more of an impact on changing overall project goals (see the following question). The context analysis, which listed six areas of concern (culture; language; gender; politics; design; and communication) impacted the instructional design decisions. Factors related to each concern affected the design project to greater or lesser degrees depending on the amount of influence designers felt they had over a particular issue. For example, changing instructional elements related to culture (modifying or adding examples), editing language, and re-formatting the layout were all elements in the direct control of those who were revising the courses. An additional element that could be controlled was the design of assessment activities, although the continued speculation about communication with students (i.e., receiving assignments and sending feedback) made control seem tenuous at times. Aside from the misgivings related to logistics, it can be said that context analysis played an important part in the instructional redesign process by creating guidelines for the adaptation efforts.

2.) How did the original UPIC project goals change?

Collaboration seems to be an intuitive means of bridging cultural differences and meeting infrastructure needs. However, past experience has shown that various learning institutions or educational media agencies who have attempted collaborative efforts often had limited, if any, success (Hawkridge, 1979; Moran & Mugridge, 1993). Although various reports have documented collaborative efforts (e.g., Bahlman & Robertshaw, 1989; Garnier, 1974;

Kareem, 2000), the resulting product is typically a jointly produced program to be used in both contexts. The value of this study extends from detailing the collaborative re-design efforts. This variation of existing models may well aid countries who possess the human resources for re-design, but do not have the initial funding or resources to create the innovation itself.

Fullan and Pomfret (1977) introduced the concept of *mutual adaptation* (p. 340) as one of the means of studying implementation of an innovation. Mutual adaptation is the process by which an organization, which adopts one type of innovation, changes it to fit its own needs. Creed and Perraton (1999) implore the use of "broader-based and case study approaches" that will provide managers and policy makers with a framework for "models and practices that are appropriate (and therefore durable) in the context in which they are working" (p. 19). The authors go on to suggest that an apprenticeship model, one that focuses on "activity-based training," (p. 20), be used to train ODL material authors.

Among the original project goals specified by the USAID-UPIC proposal created by Virginia Tech was the concept that a variation of ITMA, a web-based master's degree program in instructional technology, would be established at Mzuzu University (see Appendix K, Objectives 3 & 4). The goal was to enroll 80 students in a program to be facilitated by faculty at Mzuzu who graduated from Virginia Tech's on-campus instructional technology program. A key word used in the proposal is "customized repurposing," indicating that proposal authors recognized the fact that the existing ITMA course could not simply be exported to Malawi with no modifications.

The needs assessment report indicated some of the necessary modifications. Instead of an on-line master's degree program, the report authors found a much greater need for a program that would certify secondary school teachers, particularly teachers working in the community day secondary schools (CDSS). A large number of survey respondents at CDSS's did not have bachelor's degrees but 2-year diplomas from a teacher training college. And, because computer and Internet distribution is so low in Malawi, any distance program would have to be print-based.

However, due to a lack of time and a lack of available teacher-education expertise (relevant to Malawi), the idea that designers could plan and develop introductory courses to certify secondary teachers was not feasible. Mzuzu faculty, none of whom yet have earned a Ph.D. in instructional technology, would not have the credentials to teach in a master's program. On-line delivery for ITMA in Malawi was not possible and the suggestion that Virginia Tech professors could begin delivery of the program was not possible for logistical reasons. No such plans were made for the ICET activity through the instructional technology program[12].

Being that the program would be entirely new, all participants agreed that a pilot study for formative evaluation purposes would benefit the long-term goals of the distance education efforts at Mzuzu.

With these factors in place, a compromise was reached that changed some of the project goals. The following changes occurred:

1. Rather than using computer or web-based technologies, the distance program would be print-based.
2. Rather than being a master's degree program, the program at Mzuzu would be a bachelor's honors (five courses beyond a bachelor's degree).

[12] In a different USAID funded project at Virginia Tech, professors in the Teacher Education program (for primary school level) have gone and continued to go to Malawi during 2 or 3-week intervals to teach at another college in Malawi.

3. Rather than using Virginia Tech faculty to administrate the program, instructional technology experts at Mzuzu would facilitate the courses.
4. Rather then enrolling 80 students to begin the project, a pilot study of introductory courses would begin with no more than approximately 20 students (bachelor's degree holders working as teachers) from the Mzuzu area.

3.) Which delivery, assessment, and management strategies developed for the redesigned courses?

The delivery mechanism, printed booklets sent by post, was chosen to be the best strategy to communicate with learners. Two groups felt that some travel to distance education centers for face-to-face meetings might be necessary, but these concepts were not made official parts of the redesigned courses. The print-based mode was not out of keeping with the predominant means of delivering distance education in Africa (see Chapter 3). On-line delivery was ruled out entirely because learned access to computer and telecommunications equipment in Malawi is very limited, as reported in the needs assessment document and in other literature (e.g., D. Eastmond, 2000; Hawkridge, 1991; Kinyanjui, 1994). Audio technologies such as radio or cassette tapes were never discussed outside the second class meeting when a visiting professor mentioned them.

Student assessment for the redesigned courses looks essentially the same for the on-line versions. The difference in strategy is that students will have to submit assignments via post rather than via the Web. In the case of Educational Psychology and Instructional Media, formative assessments are included as part of the printed materials along with the answers. For both courses, summative assessments, whether they are chapter tests or end-of-course exams, will be proctored. The Instructional Design course relies on a project for assessment, so timely feedback became the only concern to graders.

Management strategies for the proposed program were not developed by the time the case study came to a close. Speculation about who would run the program, how students would be selected, and how the courses would be implemented only began to take shape after a trip by Virginia Tech officials to Mzuzu University in mid-July 2003. In the absence of certain assurances, designers could not make firm decisions related to administration. This is discussed further in Question #5.

4.) What did the redesign process imply about planning for implementation?

From within the study of diffusion of innovation (Rogers, 1995), the theory of perceived attributes indicates that innovations, such as a novel distance education program, have an increased chance to be implemented provided that the adopters can see the innovation's relative advantage, if the innovation is compatible with needs, values, and beliefs, if complexity is reduced, if the program is able to be segmented in such a way that it can be piloted on a small scale (trialability), and if the effects of a given innovation are observable. The case study did not measure implementation efforts, which were taking place as this report was being written. Instead, the focus has to be on the process of re-design and how various efforts align with the concept of perceived attributes (Rogers, 1995).

Taking the redesign process alone and matching up aspects of that process against Rogers' (1995) theory of perceived attributes, it seems that the implementation phase of the project has a good chance of success. After the needs assessment report highlighted the urgency to train teachers, or at least educate people who could help train teachers, the Malawian students and even their Chinese and North American colleagues could recognize the relative advantage of a distance education program. No existing model of traditional education could deal with the potential number of learners who might enroll in a future teacher education

program. Because the report was created by and for Malawians, the level of credibility was high and the results well-received at both cooperating institutions.

Distance education at Mzuzu has been shown to be compatible with the institution's needs, values, and beliefs. The project proposal itself was agreed to by administrative officials at Mzuzu as was the Memorandum of Understanding (Appendix H). The officials did so with the knowledge that a certain program would not be forced upon them, but would be adapted to fit their own needs. Furthermore, the evolution of a post-bachelor's honors program fits into what Mzuzu can provide at this time. In the future, should the university have the capacity of offer a master's program, the current courses can be used therein.

The process of adaptation and redesign can be complex, but that complexity was broken down and understood by the Malawian participants themselves. They are the ones who uncovered the needs, developed a context analysis, took part in grading existing ITMA courses, and applied their knowledge to the redesign efforts. Visits to Virginia Tech by Mzuzu officials and to Mzuzu by faculty from Virginia Tech helped alleviate any questions about the process by which the program was being developed.

Trialability, another factor in Rogers' (1995) theory, describes the ability to segment a program in such a way that it can be piloted on a small scale. This was exactly the result of the redesign effort. Rather than producing courses for a monumental distance education program that would take in thousands of learners, the Malawians returned to their country with a small set of courses that will be piloted and evaluated on a small scale with learners in the surrounding area. Planning for the pilot test implementation began in July 2003.

Finally, the theory of perceived attributes states that the effects of a given innovation must be observable. One innovation is the distance program itself, which of course has not yet produced results that can be observed. However, another innovation where results can be observed is the process of redesign itself. The results of this innovation, the redesigned courses, are tangible.

Successfully matching points of Rogers' (1995) theory of perceived attributes with actual project results is no guarantee of success, yet the fact that certain elements are in place does make a positive impact on the potential for adoption and implementation. An aspect of diffusion theory not covered in this study concerns the values and beliefs of adopters. From early indications, it appears that the project may be resisted due to personal attitudes and beliefs, not due to the nature of the innovation itself.

5.) In what ways do inter-institutional issues factor into the adaptation process?

Among the cautions arising from different case reports in Moran and Mugridge (1993) is that increasingly complex relationships (too many decision levels) and a mismatch of organizational cultures and politics can threaten collaboration. Distance education courses were adapted to the general satisfaction of participants, so collaboration succeeded at one level. Other factors not related to redesign, however, could potentially undermine even very good instructional design efforts.

Certain political factors related to course administration could not be controlled by any of the participants, even those faculty members who also were part of the UPIC project team. In their context analysis, the Malawian students had a number of questions that simply could not be answered and most of which remained unanswered even as they returned home. On the whole, these unanswered questions did not impact the instructional design itself, but they had an unsettling effect on the designers – both Malawian and non-Malawian. Participants' comments in interviews and in journals, as well as my own observations, led me to believe that

the unsettled nature of Mzuzu's distance program played a role in defining how much they felt they could change.

The best example of this concerns the administration of the distance program. Malawians involved in the redesign project simply did not know if they would be kept together as a team upon their return or if they would again work in their previous capacity (as they suspected). Because of this, certain assignments and methods of assessment could not be finalized. If, on one hand, the Malawians would work full-time in the distance education program, then they would have plenty of time for assessment and feedback. Rather than offer multiple-choice quizzes or abbreviated essays, they could ask students longer explanations or take more time to edit design documents in the ID course. On the other hand, should they be reassigned to previous roles with full course loads and commensurate lecture responsibilities, then the time to grade external students' work would be much reduced.

6.) Which practical and theoretical considerations influenced a team of designers as it adapts a distance education course for the Malawian context?

Practical considerations. At the time this case study was proposed, it was unclear how the adaptation would take place, but it was assumed that it would begin no later than October 2002. Intervening factors related to the ability of Malawian students to travel to the United States prevented this from happening. In the end, the entire team was not assembled until January 2003, meaning that the time available to create instructional products outlined in the USAID grant proposal was very limited. Participants in the IT Clinic recognized time as a limiting factor and realized that some products could not be developed by the beginning of May. They also considered the resources and expertise they had available: pre-developed courses that would require some redesign and editing, but not full-scaled development and professors instructional design as experts. Given these factors, they negotiated the redesign of selected courses that could then be used in a B.A. honors program.

In the case of textbook selection, the practical consideration of time became more important than the practical issue of obtaining and distributing expensive texts. The practicality of using pre-existing texts also over-rode epistemological or moral considerations associated with giving textbooks designed for a North American learners to an African audience.

Another practical consideration was the logistics of delivering courses. Major redesign decisions were based on the fact that the on-line courses for ITMA would have to be delivered using a print-based format when offered in Malawi. The fact that print would be used meant that slow-downs in communication would be inevitable. It also meant that certain elements of the course, namely summative assessments, that are protected by technology in the on-line iteration would not be protected if printed, thereby requiring the need for proctoring. Slower communication means that student work and instructor comments on that work would take much longer than is currently the case with ITMA courses. For final assessments, test centers might have to be developed in order to protect against cheating.

A final practical consideration concerns the cultural context itself. The individuals involved in redesign who were not from Malawi looked to the knowledge and experience of their Malawian colleagues to guide their efforts. They relied on the feedback of another group of Malawian students during the formative evaluation process. A survey of the redesigned courses shows that elements of language and instructional examples were changed based on indigenous input.

Theoretical considerations. Instructional design is the tangible expression of educational theory. Those who write about instructional design (i.e., Dick, Carey, & Carey, 2001; Driscoll, 1994; Gagné et al., 1989; Reiser, 1987; Richey, 1986; Shambaugh & Magliaro, 1997; P.L.

Smith & Ragan, 1999) recognize that a designer's perspective on how and why people learn influences design. Driscoll (1994) states, "The basic assumption, no matter what the particulars of an instructional setting, is that effective instruction is informed by theories of learning" (p. 22). Given the intimate connection of theory to the production of instruction, one would think that it would be a topic oft discussed among those engaged in design or even redesign. Such discussions were largely absent from conversations among designers as they redesigned the various courses.

The purpose of this study was not to ferret out theories from within the redesigned projects. Neither was it my intention to examine instructional theories implemented in the IT Clinic itself. Instead, my intention was to listen for and look for places where learning or instructional theories were overt – to report the theoretical considerations as raised by the designers themselves. This only happened in limited instances when a student might talk openly about the need for timely feedback (see Mory, 1996) or the need to reduce transactional distance (see Keegan, 1996). Specific elements of cultural theory (see Geertz, 1973; Hofstede, 1991) were not discussed either.

The reasons for not talking about theoretical influences can in all likelihood be attributed to two factors: time and the designers' perceived role. Again, time plays a factor in that it limited how much discussion went on in the IT Clinic. Groups, when they worked together, concentrated on what changes needed to be made rather than debate theoretical postures. Designers perceived their roles as essentially editorial, stating that they were unwilling to make changes to material that they felt was "good." The lack of time to develop instruction from the ground-up limited considerations of theoretical influences, an important element of design as reported by those who have developed distance education programs (Bichelmeyer, Misanchuk, & Malopinsky, 2000; D.M. Moore, Lockee, & Burton, 2001).

Implications

Where a case is unique as it is in this instance, it is difficult but not impossible to make recommendations for future processes. The chapter describing the methodological approach to this study explains how the ideas of generalizability and transferability find their place in such a study. So, rather than list recommendations, I have created a list of implications that might bear on efforts to contextualize instruction as it is carried out in other settings.

Factors to Consider in the Redesign Process

Adaptation requires negotiation. Every level of the redesign project involved negotiation. Negotiating outcomes began at the international level between funding agencies and educational institutions and went all the way down to the give and take of team collaboration in the I.T. Clinic. The ability to compromise is key to allowing the adaptation process, even the adoption (Rogers, 1995) process, to happen naturally.

Process context is as important as local context. The goal of the redesign efforts was to create courses that could be used in Malawi using local contextual factors (Tessmer & Richey, 1997). But it is also true that a process context also has a shaping influence in the design of the courses. Factors such as project expectations, perceptions of design or editorial roles, teamwork and communication, and time all make up the process context. These factors influence design as much as factors in the local (in this case, Malawian) context do.

Infrastructure drives instructional design decisions. Well-designed instruction is undoubtedly important. In the redesign project, though, it was not instructional design theory or best practices that shaped the adaptation efforts. The focus on infrastructure – what was possible and what was not and what was unknown – shaped design decisions almost exclusively.

Good message design in one format is not the best for another. One area of design did not receive a lot of attention was that related to layout-related decisions, yet is an important element in instructional design (Fleming & Levie, 1993). The technologies that would have brought about a more print-friendly format went unused. Just as web-based courses should be more than a simple "repackaging of print-based materials" (A. Brown, 1998), the same should be true in reverse.

Instructional designers need to talk about theoretical issues. It cannot be assumed that designers will focus on the ramifications of theory on their work or in their work. Shambaugh and Magliaro (1997) write, "Learning beliefs are frequently embedded in the complex contexts of real settings where the values and beliefs of schools, businesses, and communities must be considered" (p. 4). They go on to assert that making one's beliefs known and by comparing them to design components allows one to "remain vigilant that your beliefs are addressed appropriately for the nature of the content, the needs of the learners, and the realities of the instructional setting" (p. 4). In this study, designers tended to focus on practical issues related to logistics and made generally surface-level changes. This does not mean, however, that their work has no theoretical relevance. Opportunities for a discussion about designers' personal theoretical orientations as well as a discussion on the theoretical assumptions of courses selected for redesign should be provided.

Closing Thoughts

The anecdotes shared throughout this document have in common a metaphorical importance for the elements in the case study. Janet's inability to find a card catalogue demonstrated quite clearly how infrastructure challenges can frustrate otherwise sound instructional design plans. The vignette about invigilators vs. proctors showed that even people who ostensibly speak the same language and who are sitting together in a room can have an occasional hiccup in understanding one another. One can easily surmise that collaborations at a distance will experience the same. Overcoming those misunderstandings is part of the communication and cultural negotiation that must take place, particularly in an international project. Finally, the story that introduced this chapter about the use of salt in foods, illustrates the point that elements found to work in one setting are not likely to work in another. There is no cookbook to prescribe adaptations, only suggestions and recommendations can be offered. To this end, this study has hopefully elucidated parts of the process that can help shape future adaptation efforts.

Post-Script

During this study I took time to read a book by novelist and travel writer Paul Theroux (2002) *Dark Star Safari: Overland from Cairo to Cape Town*. Theroux chronicles a fascinating, sometimes dangerous, trip down through the eastern part of Africa using all means of ground transportation. As he traveled to South Africa from Egypt, he eventually made his way to Malawi, where he taught as a Peace Corps volunteer just before Malawi's independence from the British in the mid-1960s. I was quite taken by his perspective on what he calls the donor culture of Africa. His opinion is his own, to be sure, but the studies and anecdotes related by Schramm (1977), Ely (1990), and others confirm the fact that many projects in the Third World are not sustainable. Theroux writes about it this way,

> Africans refused nothing. A road, a dorm, a school, a bank, a bridge, a cultural center, a dispensary – all were accepted. But acceptance did not mean the things were needed, nor that they would be used or kept in repair. ... these were like inspired Christmas presents, the sort that stopped running when the batteries die, or they break and aren't fixed. The projects would become ruins, everyone of them, because they carried with them the seeds of their destruction. And when they stopped running, no one would be sorry. That's what happened in Africa: things fell apart. (p. 215)

A critical question I have had to ask myself time and again through the redesign efforts has been, "But is it worth it?" Past successes in other projects have been short-lived, not sustainable. The problems of sub-Saharan Africa – AIDS, famine, drought, corrupt politicians, poverty, and so on seem to pose insurmountable obstacles. Is the work that has been done in this project doomed to fail?

In this instance, despite the challenges faced presented by working in the Malawian context and at this unstable time in world history, I believe that the UPIC project has the good chance of success if only because of one factor: the people. This grant was not about setting up expensive distance education classrooms and computer networks. Had that been the case, I would almost certainly be a pessimist. The difference, in this case, is that people – people we know and with whom we have worked – are at the center of all these efforts.

Theroux later writes, "That was my Malawian epiphany. Only Africans were capable of making a difference in Africa. All the others, donors and volunteers and bankers, however idealistic, were simply agents of subversion" (p. 343). The graduates in instructional technology, now working again at Mzuzu, are not left scrambling to maintain something they had no part in making. They were the designers, authors, and editors who helped make the adaptation process a reality.

The way forward will no doubt be fraught with the difficulties, but I share Theroux's perspective. I believe our Malawian colleagues are capable of making a difference in Malawi and very likely in their region. Their ability is not based on what any institution did for them, but what they did for themselves. I strongly feel that my place now and in the future is not to do for others, but to support others' efforts and seek ways to empower people. This is the reason I am a teacher.

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APPENDICES

Appendix A: Instructional Technology Clinic Course Activities

Appendix B: Data collection matrix

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Appendix P: On-line Instructional Media course components

Appendix Q: Print-based Instructional Media course components

Appendix A

Instructional Technology Clinic Course Activities

Week	#	Date	Activity
1	**1**	Jan. 13	Student introductions; general discussion related to class structure
2	**2**	Jan. 20	Four Malawians present the needs assessment report; discussion and questions afterwards.
3	**3**	Jan. 27	Syllabus distributed and discussed. Class discussions needs issues in relation to USAID grant obligations; decide on project scope.
4	**4**	Feb. 3	Students do an activity in which they discuss all the possible people who would be involved in the course development and implementation.
5	**5**	Feb. 10	Final group assignments are made and projects finalized. Discussion about how distance education will run at Mzuzu.
6	--	Feb. 17	*No class: cancelled due to inclement weather. Groups are to meet.*
7	**6**	Feb. 24	Discussion of context issues and logistics issues. Design teams discuss their plans for re-design.
	--	Mar. 3	*No class; Spring Break. Groups can meet if they so desire.*
8	**7**	Mar. 10	*No class: Malawian students at conference in Washington, DC. Groups are to meet.*
9	**8**	Mar. 17	Design groups meet during class time, each group meeting with one of the three professors who acts as subject matter expert.
10	--	Mar. 24	*No class: Malawian students at conference in New Mexico. Groups are to meet.*
11	--	Mar. 31	*No class: Room is being used for external accreditation review. Groups are to meet.*
12	**9**	Apr. 7	Design groups meet during class time.

Appendix A (continued)

Week	#	Date	Activity
13	**10**	Apr. 14	A professor meets with each group to discuss their evaluation strategies. Formative evaluation packets are due to reviewers.
14	**--**	Apr. 21	*No class: Design groups are to meet.*
15	**11**	Apr. 28	Evaluation reviews due; students discuss elements of the formative evaluations in class.
16	**12**	May 5	Each group presents a PowerPoint presentation, discussing group roles and how the re-design process occurred.

Appendix B

Data collection matrix

Interview and conversations log

Date	**Int/Mode**	**Format**[1]	**Type/Topic**
4-15-02	Walters	R	Malawi perspectives
4-16-02	Myers	R	Malawi perspectives
4-16-02	Hale	R	Malawi perspectives
07-19-03	Chilingulo	N	Perspectives on distance teaching experiences
07-23-02	Goodman	N	Conversation about ITMA
09-04-02	Goodman	N	Brief conversation
09-10-02	Goodman	N	Conversation about ITMA grading
09-28-02	Alex	R	Summer experience
10-16-02	Hale	N	Project news
12-06-02	Herbert	N	Context perspectives
12-10-02	Herbert	N	Brief conversation: needs assessment report progress
01-14-03	Goodman	N	Brief conversation
01-18-03	Herbert	N	Summer experience
01-20-03	Black	N	Discuss IT Clinic details
01-22-03	Herbert	N	Perspectives
01-25-03	Black	N	IT Clinic issues
01-28-03	Goodman	R	IT Clinic issues
01-28-03	Kondwani	Y	Grading and needs assessment experiences
01-29-03	Heidi	R	ITMA grading
02-06-03	Justina	R	Summer experience
02-07-03	Anthony	N	Perspectives
02-07-03	Alex	R	Summer experience
02-20-03	Janet	R	Background information
02-13-03	Aimes	R	Pre-Malawi
02-21-03	Underwood	R	General information
03-21-03	Aimes	R	Post-Malawi
03-31-03	Black	N	General information
04-07-03	Jonathan	R	IT Clinic exps
04-09-03	Kondwani	N	Context perspectives
04-09-03	Matthews	N	Context notes
04-15-03	Matthews	N	Context notes
04-15-03	Mi Ling	R	IT Clinic exps
04-23-03	Anthony	R	IT Clinic exps

[1] Format: R = recorded; N = notes taken

04-23-03	Zhen	R	IT Clinic exps
04-24-03	Herbert	R	IT Clinic exps
04-24-03	Kondwani	R	IT Clinic exps
04-24-03	Alex	R	IT Clinic exps
04-25-03	Janet	R	IT Clinic exps
04-28-03	Black	R	IT Clinic – follow-up
04-28-03	Goodman	R	IT Clinic - general
05-02-03	Justina	R	IT Clinic exps
05-15-03	Herbert	N	Informal conversation: follow-up

Observation schedule

Date	**Time**	**Place**	**Event**	**Topic**
Jan. 20, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Malawians present Needs Assessment report; discussion and questions follow
Jan. 27, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Decide on project scope
Feb. 3, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Decide group roles/people involved in the course devel. & implementation process
Feb. 10, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Talk about team make-up and projects; administrative ramifications of DE at Mzuzu
Feb. 17, 2003	1 – 4 p.m.	WMH 220	IT Clinic	(no recording) Group work
Feb. 24, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Discussion of context issues and logistics issues. Design teams discuss their plan.
Mar. 3, 2003	Spring Break			
Mar. 10, 2003	VSTE Conference – Arlington, VA			
Mar. 17, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Design groups meet in 220
Mar. 24, 2003	SITTE Conference – Albuquerque, NM			
Mar. 31, 2003	No class; NCATE reviewers are in WMH 220			
Apr. 7, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Design groups meet in 220
Apr. 14, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Potter meets with each group to discuss their evaluation strategy
Apr. 21, 2003	No class; Group work sessions			
Apr. 28, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Evaluation reviews due
May 5, 2003	1 – 4 p.m.	WMH 220	IT Clinic	Group presentations

11 classes x 3 hours = 33 hours

Document collection

Project related documents

- Project proposal
- Memorandum of Understanding
- Annual work plan
- Quarterly reports

Class-based documents

IT Clinic (Spring 2002)

- Syllabus
- Needs assessment plan (carried out Summer 02)
- Needs assessment report (completed Jan. 03)

IT Clinic (Spring 2003)

- Syllabus
- Instructors' planning notes (through interview)
- Context analysis report
- ITMA courses (downloaded)
- ITMA course analyses
- Design blueprints
- Student journals (3x per semester)
- Evaluation rubrics
- Final draft of redesigned courses
- Final Presentations

Other documents

- Student participant biographies
- Copies of signed informed consent forms

Codes used to report data

INT = Interview
ITC = IT Clinic document
JRNL = IT Clinic Journal
NAR = Needs Analysis Report
O = Observation

The middle number in a reference is an internal code used for the researcher's purpose. The lowercase Mu symbol, "μ," indicates multiple times or sources, such as an observation made many times.
¶ = paragraph (no symbol in front of a number refers to a page number).

Examples:

(ITC/20/¶33)
This is an assignment turned in by one of the IT Clinic students. It is the 20th assignment referenced by the researcher. The specific quote would come from paragraph 33.

(INT/45/12)
This is an interview of a participant. It has been labeled Interview #45 by the researcher. The specific quote comes from page 12.

(O/μ)
Multiple observations.

Appendix C

List of participants

Par. #	**Gender**	**Nationality**	**Role/Title** [b]
1 [a]	F	Malawian	IT master's student; Lecturer in education, MU
2 [a]	M	Malawian	IT master's student; Lecturer in physics, MU
3 [a]	M	Malawian	IT master's student; Lecturer in language and literature
4 [a]	M	Malawian	IT master's student; Library information technologist
5 [a]	F	Malawian	IT master's student; Assistant librarian
6 [a]	F	Chinese	IT doctoral student; former English teacher
7 [a]	F	Chinese	IT doctoral student; staff member in New Media Center
8 [a]	M	U.S.	IT doctoral student; graduate assistant in library
9 [a]	M	U.S.	IT doctoral student; non-teaching faculty member in Math Dept.
10 [a]	F	U.S.	IT professor, VT; Co-primary investigator of USAID/ICET project
11 [a]	M	U.S.	IT professor, VT; Coordinator of ITMA program
12 [a]	M	U.S.	IT professor, VT; Lead investigator of USAID/ICET project
13	M	U.S.	IT professor, VT; Evaluator of USAID/ICET project
14	M	U.S.	IT professor, VT; Co-primary investigator of USAID/ICET project
15	M	Zimbabwean	Professor of education, VT; Lead investigator of USAID/Teacher Education project

Appendix C (continued)

Par. #	Gender	Nationality	Role/Title [b]
16 [c]	M	Malawian	Teacher ed. doctoral student; background in mathematics education
17 [c]	F	Malawian	Teacher ed. doctoral student; background in language education
18 [c]	M	Malawian	Teacher ed. doctoral student; background in social studies education
19 [c]	F	Malawian	Teacher ed. doctoral student; background in agriculture and primary education
20 [c]	M	Malawian	Teacher ed. doctoral student; background in technical education
21 [c]	M	Malawian	Teacher ed. doctoral student; background in language education
22	M	U.S.	Educational psychology professor; VT
23	M	Malawian	Coordinator for Continuing Education, MU
24	F	U.S.	IT doctoral student; grader for ITMA program

Notes:
[a] Active Participant in the Instructional Technology Clinic
[b] MU = Mzuzu University / VT = Virginia Tech
[c] Participated in formative evaluation of IT Clinic materials

Appendix D

Excerpted of interview (from INT/8/¶166-200)

Researcher: What are some of the practical issues arising out of the context of Malawi that you see affecting...?

Respondent: I'm still not sure what's going to happen when they go back to Malawi. I get such conflicting information from the Malawians. Like the other two groups, one of the class meetings, I don't know, it's been a good three or four class meetings ago, which was a long time ago because we really haven't met, the other two groups were pretty much positive of the being able to have textbooks. And then Justina with say, "No, that's just ridiculous. It's an $80 dollar textbook, there's no way they'll have it." And Herbert seems to think they'll haven't because somebody is going to donate it, or some fund is going to pay for it. And I just wish... that seems to me like you should be a pretty simple decision, in that room of 10 people we should be able to decide, "Yes they will have textbooks; know they will not and we have to design accordingly." So I'm still not sure. Even with ours, we have permission to make copies of Dick & Carey, but do we make 20 copies of things here to send back, which Prof. Goodman says, "Oh... you want to take back all that heavy paper to Malawi." Like he's thinking of it as a transportation issue. And when he's asked Justina, "What if you just take back Dick & Carey and make copies of it there, can you make copies there?" And she says "yes". And then you talk to Herbert and he's real positive about being able to make copies, but they have like one copy machine in the library that maybe is not the most reliable thing in the world. So I don't know. We're designing around the fact that these guys are going to have access to Dick & Carey through Xeroxed copies, are they going to have them? You know, I don't know.

Researcher: You've gone through the Webpage instruction pretty thoroughly, line by line, looking for words like contractions, and measurements and what not, the feel comfortable with the fact that Dick & Carey will be used and there has been no editorial process for it?

Respondent: I'm comfortable with that. I was a little thrown when I first contacted the publishers I went through the UK because I thought they would be closest to Malawi. And the ISBN I gave them for Dick & Carey, they said that the U.S. printing for the book. And I thought "Oh. What printing what we want?" But I think there's a... my experience with Dick & Carey... me anything that I've done of the ITMA materials is more because they were created in southwest Virginia, and in my opinion they weren't written for a national audience. They're written very much, not that there poorly done, in but their people from southwest Virginia who are not professional book publishers, and I think Dick & Carey will be fine.

I still have to talk with the course author actually. I'm interested to know what he might change. I get the impression that he created most of this course.

Researcher: Yeah, he did really a lot of work.

Respondent: It looks very much like Dr. ____'s work.

Researcher: Yeah. It would, it would.

Respondent: Which I think as a good thing. I think his ID course was a really good course. But I think probably if that had been passed off to somebody for a broader audience, that some of the language would have been a little bit different. I mean it's not by any means terrible.

Researcher: Of the changes that you've made so far, what you think the most important changes have been?

Respondent: Um... [he pauses to think]

Researcher: Let me break that down into two parts: logistical changes and cultural changes.

Respondent: Hmm. Logistics of how the students are going to do the course? How it's going to be delivered?

Researcher: The first.

Respondent: Well, we took out all the sections about how to submit your work because Jonathan and I could not figure out how they were going to submit their work and Justina said that they would figure that out when they got back to Malawi. We don't know if they're going to be handwriting, we don't know if they're going to have a composition notebook like this, we don't know. The other things, probably just some of the wording, some of the examples. I know one of the examples in one of my sections was an objective involving a checking account, which Justina said basically doesn't exist there, so trying to pick out cultural things like that and change them. I think probably the biggest thing I've done is lots of contractions and after I heard discussions when they were talking about the Malawian context and things to look for about language, I tried to be real careful and make sure a lot of the contractions were spelled out. Maybe a thing like "folks," or words that I see as a little bit American. Even the words that didn't strike me as American, but came back from Justina after she did look at one of my things, was the word "robust." And she said that probably wouldn't make much sense in Malawi. So I've trying to key in on words of maybe like a technical nature and examine them closely.

Researcher: Have you made any changes to like gender type issues?

Respondent: There haven't been a lot. There haven't. The largest use of things like that occurred in the magazine articles, and I pretty much left it.

Appendix E

Excerpt of observation
(from O/14/¶1-58)

Observation
03/14/03
2:05 p.m. to 3:00 p.m.
Classroom 220

Instructional Design course team: Justina; Anthony; Jonathan
Previous meetings:
Justina and Anthony met during Spring Break
Anthony and Jonathan met on March 10, 2003 to create a project timeline

Previous two meetings were to plan/create the "Blueprint" document sent by ANTHONY on 3/14.

Documents used to help create the blueprint: J__'s blueprint; on-line book at University of Georgia.

There is no printed agenda for the meeting.

The team sits on one side of the table, I sit on the other side first to the left, but still in front of Jonathan. JUSTINA sits in the middle of the two men. When a person talks, he/she will occasionally look at me as if I were part of the conversation.

My note: I am not comfortable with this and I eventually move to the right side of everyone to make it harder for them to look at me.

First five minutes of the conversation the two guys do all of the talking. Jonathan asks questions about assessment to Justina. He wants to know if it'd be o.k. to give a quiz after each reading.

Currently (as they describe it), the ID course requires a student to read, then do, and then get feedback about 1x per month. The proposal would be for someone to read, then take a self-assessment, then complete the task, then get feedback.

Jonathan asks (laughingly): "Is this [referring to the self-assessments] something we need to create?" The team decides these would not be too hard to create.

Jonathan and Anthony go to the ITMA ID course via the classroom computer/LCD projector. Anthony states that he could not find any self-assessment quizzes the last time he looked for them even though the syllabus refers to them.

Justina asked, "Perhaps there are some quizzes we can use?"

Concerning the section called "self-check". Anthony states, "Is there a better buzzword?"

Anthony: << I feel like I'm plagiarizing, but since we're working from the same course…>> <<I'm not uncomfortable with it, it's just different.>> He then refers to Greer's book on ID Project Management.

Jonathan explains to Justina what he and Anthony talked about on Monday (the electronic component being a CD-ROM version of the course). Justina nodded her head and said o.k., seeming to indicate that it was fine.

Anthony states the instruction should be in PDF format so it can't be change, but concedes that since people will need to be able to edit it, they will also need to put it in Word or some other form. He asks Justina what they should use.

Justina states that MS Word format will be fine.

The two guys then discuss the merits of PDF, Rich Text, etc.

Group goal: by late Sunday night (3/16) they will finish the blueprint for the course.

My note: When Justina speaks, it is usually just in one or two sentences. She says very little but is paying close attention to what the guys are saying. She never interrupts. This is not different from how she is generally, though.

Anthony is not sure when the expert review will happen. Jonathan says that it's something they'll have to ask.

Appendix F

Excerpt of student journal entry (from JRNL/28/11-14)

Format our course document
03/21/03: 1 hour
Since we copied our course directly from the ITMA course and made changes based on it. Some of the fonts and format changed and are not consistent across the course. I spent 1 hour remove the unnecessary image bars, texts, fixed the typos, and formatted the whole course from lesson 1 to 13. Next time we can work on lesson 10 to 13 directly in the right format.

Wrote up the journal from 3/16 to now
03/22/03: 2 hours
Since I put efforts preparing qualifying exam. I did not write down the activities happened in last 2 weeks. So I spent 2 hours to recall and write up the journal part. It might be a good practice to write it down soon after the activities. In that way, I can use some chunks of time.

Read "Analysis of Emerging Practices in Globalizing Instructional Materials"
03/24/03: 1.5 hours
It is pretty interesting to read this article since I worked for a multi-national company, which is based here in the States before I attend school here. Also I worked in the localization department. The task of our department was to localize English software to Chinese version. I could find many things talked in this article when I thought back about what was going on when I work in the company. For example, there is a globalization process before localization, i.e. the localization is based on globalization. We begin our localization from an international version instead of an American version, which is especially true for the desktop publishing part. Also it is a multi-track globalization process since the globalization is carried on in several different countries at the same time. There also were many training conducted in my former company and I could see the theme that mentioned in this article, such as corporate culture win, scarce front-end analysis, representation from target culture, etc. Our project is different from what talked in this article since we do not need to localize it to Malawi language. But there are things that are the same for us to consider in the instructional design process, such as the learner's analysis, context analysis. Our case will be a more thorough case of instructional design as the author indicated in his report that front-end analysis and evaluation/feed back are seldom conducted in those companies.

Review the objectives, pretest, practice quiz of the companion web site
03/27/03: 0.5 hour
The objectives are the same as those on the text book at the beginning of each chapter. We do not need to compile them in the Learner's Guidebook. We need to get the answers of the pretest and practice quiz of each chapter.

Wrote General Assessment Plan part of the plan document
03/29/03: 2 hours
Our team divided the plan document to each team member. I am responsible for the General Assessment Plan and Instructional Strategy parts. In the General Assessment Plan part, how learner's performance will be assessed is constructed. We basically follow the ITMA course and change the online chapter test to exams conducted in exam center. One problem is that we do not have access to the chapter test in the ITMA course.

Wrote Instructional Strategy part of the plan document
03/30/03: 2.5 hours
The instructional strategy is focused on the whole structure and organization of the course across the 13 chapters. Since we have already decided most part of the course, it is just a matter of putting them into words.

Group Meeting
04/04/2003: 1 hour
In this meeting we worked on the pretest and practice quiz, then we divided tasks to be done to each person. The tasks include: edit the pretest and practice quiz, check integration activities from lesson 7 to lesson 13, edit chapter test, make rubric for the review materials. We changed our plan of the learner's guide. We decided to compile the test part as an individual part rather than insert them into each chapter.

Edited pretest and practice quiz (Lesson 6 to 9)
04/05/2003: 1 hour
I spent 1 hour to edit the pretest and practice quiz.

Edited chapter test
04/06/2003: 2 hours
This test is what used in ITMA course for students quiz. Currently some of the answers are not correct. We will wait Dr.___ for the correct answers. But since these test will be used in exam centers. We can always get the answers later on.

Edited chapter test
04/07/2003: 3 hours
Continued on formatting chapter test. It is a time consuming task.

Appendix G

Institutional Review Board form

There were originally three review forms, one for each type of participant: student, faculty member, and those who were asked to submit to interviews only. The forms are essentially the same except for minor changes to wording. This form is for student participants. For the purpose of this document, certain contact information has been blacked out to protect privacy.

Virginia Polytechnic Institute and State University
Department of Teaching and Learning
Informed Consent for Participants
In Research Projects Involving Human Subjects

Form for Student Participants

Title of Project: The role of context in instruction redesign of a web-based master's degree course.
Investigator: Ross A. Perkins
Research Advisor: Dr. Barbara B. Lockee

I. Purpose of this Research Project

This project investigates the role of contextual information as it is applied to the redesign of a web-based master's degree course. The researcher will use the data collected to create a report that fulfills the dissertation requirement of the Instructional Technology doctoral program. The study may be used in the future for other evaluative studies concerning the ICET activity of the Malawi/UPIC agreement between Virginia Tech and Mzuzu University. The basis for the study itself draws from literature in the areas of diffusion of innovation, distance education, and contextual analysis in instructional design. This study will involve up to 30 participants.

II. Procedures

The data for this study is based on research methods commonly used in qualitative, case study procedures (see *Case Study Research*, S. Merriam, 1988). The methods include: interviews, observation, and document collection. The impact of each of these procedures on you is explained below.

Interviews: You will be contacted by e-mail, in person, or by phone to set-up a time for a face-to-face interview. Each interview will generally last no more than 30 minutes, but may last up to 1 hour. In instances where face-to-face interviews are not possible, you will receive an document either by e-mail or through regular mail with interview questions. Interviews will "semi-structured," in that there will be certain questions asked of you (as determined by the researcher), but your responses will be open-ended (as opposed to multiple choice or some other format where pre-determined answers are provided). The interviews will be recorded by tape recorder if done in person; the information will then be transcribed by the researcher. At the completion of the study, any voice recordings will be erased from any magnetic or digital format. The

transcription record itself will include only pseudonyms. If done in written form, the responses will stored in such a way as to not identify the participant (except by pseudonym).

Observation: Observations are only done in person by the researcher. The researcher will inform all participants about when and where the direct observations will take place. The observations may occur during class times, regularly scheduled meetings, or any other established work period. Given the nature of the research, observation will be limited to those times during which the participants are engaged in the transformation of the distance education program. Observation data will be recorded by hand and, with the permission of the participants, with the use of electronic recording devices.

Document collection: Participants may be asked to submit copies of various documents to the researcher for the purpose of the study. The researcher will ask for permission to collect such items as e-mail, design journals, letters, planning documents, design documents, etc. This consent form is not blanket permission for all documents submitted during the course of the project. Any document used by the researcher will be done with specific permission from the author(s).

III. Potential Risks
This study will not expose you to risks you would not expect to experience during normal, everyday activities. There is no perception of threat that may arise as a result of participation in this study.

IV. Potential Benefits
You may not receive any personal benefit from participation in this study. Potential benefits may include gaining insight into the research process itself and/or the topic of inquiry.

V. Extent of Anonymity and Confidentiality
Your anonymity will be protected. The research report will not include your given name. Descriptions about you or your background will be placed under yet another name so that your identity cannot be determined by linking your biographical information with comments you make during interviews. The pseudonyms shall be created by the researcher and known to him only.

VI. Compensation
Participation in this study is voluntary and there is no remuneration, monetary or otherwise.

VII. Freedom to Withdraw
You have the right to withdraw from this study at any time. Dropping from the study will not impact your grade or status in the Instructional Technology graduate degree program. To withdraw from the study, you should contact Dr. S[redacted] who can be reached by phone at 540-[redacted], or by e-mail at [redacted]@vt.edu. Dr. [redacted] serves on the research committee of the researcher but is not directly involved with the study itself.

VIII. Approval of Research
This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Teaching and Learning.
IRB Approval Date: October 25, 2002
IRB Approval Expiration Date: October 25, 2003
IRB Approval #: 02-519

IX. Participant's Responsibilities
I voluntarily agree to participate in this study. To the best of my ability, I will answer questions posed to me by the researcher and share with him insights that may be helpful to the study. I will make every attempt to keep appointments for interviews and meetings, informing the researcher of potential conflicts should they occur and availing myself to alternate times or dates in the event of a missed meeting. Additionally, I will comply with reasonable requests for documentation and cooperate during periods of observation.

X. Participant's Permission
I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

_____Date_____
Participant signature

Should I have any questions about this research I may contact:
Investigator: Ross A. Perkins Phone 540-[redacted] [[redacted]@vt.edu]
Faculty Advisor: Barbara B. Lockee Phone 540-[redacted] [[redacted]@vt.edu]
Department Reviewer: J[redacted] Phone 540-[redacted] [[redacted]@vt.edu]
Chair, IRB: D[redacted] Phone [redacted] [[redacted]@vt.edu]
Office of Research Compliance, Research & Graduate Studies

Please complete both copies of this consent form, return one copy to me, and keep one copy for your records.

Appendix H

Virginia Tech – Mzuzu University Memorandum of Understanding

The UPIC Project
Memorandum of Understanding (MOU)
Between
Virginia Tech and Mzuzu University
(UPIC Partners)

Virginia Tech, represented by its President or Provost, and Mzuzu University, represented by its Vice Chancellor or Registrar, have agreed to the following.

1. That this MOU is meant to supplement, not to supercede, the existing MOU (attached) between the UPIC partners.
2. That this MOU is intended to facilitate and provide operational guidelines for the exchange and cooperative initiatives between UPIC partners with a particular emphasis on the ICET project.
3. That the intent of the ICET project is to build capacity at Mzuzu University to create its own set of materials to sustain the project beyond the term of agreement.
4. That as part of the ICET project a variety of approaches shall be employed for the assessing of instructional needs and the delivery of Instructional Technology materials derived from, or related to, Virginia Tech's on-line Instructional Technology Master's (ITMA) Program. These efforts may range from a complete MA degree to non-credit workshops and certificates for up to 80 students. That the usefulness and viability of continuing to use material derived from the ITMA or project generated materials will be determined by program evaluation.

5. That the continued use of ITMA materials, or other project derived materials, beyond the 80 students agreed upon will be addressed, if necessary, by a separate agreement.
6. That there will be consultations between partners about matters concerning implementation of the project including, but not limited to allocation and use of resources in accordance with the project contract.

Virginia Tech

1. Virginia Tech will use UPIC resources to support the costs associated with the collection of needs assessment information during 1st Summer 02. This support is specifically limited to travel costs and communications costs directly related to that needs assessment.
2. Virginia Tech will maintain, if necessary, the servers and on-line technical support (IT graduate students) related to the delivery of ITMA materials during the test period.
3. Virginia Tech will work with Mzuzu University to coordinate work related to the ICET project.
4. Virginia Tech will provide a needs-assessment plan and coordinate a needs-assessment report.
5. Virginia Tech will provide, without licensing fees, access to the original ITMA materials to Mzuzu University. Costs associated with media production such as print materials or CD-ROM production will also be borne by Virginia Tech.

6. Virginia Tech will provide an evaluation report to the United States Agency for International Development (USAID

Mzuzu University

1. Mzuzu University will control the ICET project vehicle, monitor its use through a vehicle log, and ensure that its use is project related.
2. Mzuzu University shall create its own ICET materials in order to sustain the project beyond the 80 students agreed to, including, but not limited to, Mzuzu University original materials for delivery in Malawi which may be based on and/or inspired by, Virginia Tech ITMA materials.
3. Mzuzu will provide time from their normal duties for the leadership cadre to grade assignments and correspond with students in the ITMA related activities during the cycle of the ICET project.
4. Mzuzu University will use any remaining or additional project resources to ensure that its information systems (infrastructure and/or personnel) are maintained and that such systems are operational and sustainable beyond the life of the project.
5. Mzuzu University shall provide a local project coordinator and the ICET project shall provide top-up allowance (buying out time) for the coordination time.
6. Mzuzu University will administer the selection of students.
7. Mzuzu University will provide University credit when necessary.

Both

1. Virginia Tech and Mzuzu University will agree on any admissions requirements.
2. Virginia Tech and Mzuzu University will determine the future of ICET project related activities beyond the 80 students agreed to, based on the evaluation of the project, anticipated future resources/markets, and costs.

Appendix I

Instructional Technology Clinic syllabus

EDCI 5594 ID Project Development
Instructors: [redacted]
Phone: 231-[redacted]
E-mail: [redacted]
Class Location: 220 [redacted]
Class Time: Monday, 1:00-3:50 p.m.

Course Overview

The IT Clinic is an excellent opportunity for the development of project management skills within the IT profession. It is unique in that you will learn more about the process of instructional design and development through immersion in authentic ID project experiences. We will examine ID on both a micro and macro level, from decision-making regarding specific ID tasks to analysis of the management process as a broader concept.

Broad goals of Clinical

1. Apply existing skills in design and development in complex environment with real client.
2. Gain additional skills in client relations and project management.

Objectives

Instructional design

1. Differentiate between information relevant and irrelevant to the project in oral discussions and written documents.
2. Identify problems appropriate for instructional design and development solutions.
3. Collect information necessary to identify instructional needs.
4. Develop strategies for meeting client and audience needs.
5. Recognize normal variances in instructional design and development process (what "problems" are normal and to be expected, and what problems are causes for concern).
6. Successfully obtain information from clients and other stakeholders.
7. Develop strategies for "dealing with setbacks".
8. Promote instructional design in manner consistent with clients' values.

Project management

1. Establish rapport with clients and team members.
2. Successfully negotiate with clients.
3. Determine personnel, facilities, and supplies needed for project.
4. Develop project timeline.

5. Distribute workload based upon team skill levels and time available.
6. Monitor time and resources to keep on track and ensure project completion.
7. Secure client and team member buy-in and commitment.
8. Manage and diffuse conflict.
9. Manage project meetings including establishing agenda, keeping meeting on track, and summarizing progress.
10. Track and publicize accomplishments.

Personal

1. Identify personal skill deficiencies and ways to overcome deficiencies (outsourcing, skill development, etc.).
2. Develop personal perspective of what an instructional designer is and does.

Teamwork

1. Accept delegated tasks.
2. Participate as productive member of project team.
3. Respect contributions of other team members.
4. Meet project goals and individual learning needs in a timely manner.
5. Articulate design and development decisions.
6. Share expertise with other students.

Course Materials

There is no required text for this course, but you should have access to a reputable ID book for guidance purposes (i.e., Dick and Carey, 1996; Smith and Ragan, 1999). I have loaners available, also. There are required readings that may be checked out from the IT lab desk (see Terry). When necessary, the instructor will provide supplementary readings on an as-needed basis.

Assessment Methods

Time sheets: Each student will establish project goals (related to their assigned role at designated times) and identify subtasks required to meet those goals. Students will keep records of the amount of time spent working on a project and assign that time to specific projects and activities.

Status reports: Each student will submit a project status report at regular intervals. It should include a list of accomplishments since the last report, a list of pending items, any concerns or difficulties, suggested actions, any additional comments.

Design documents: The ID project necessitates the production of design documents, a tool to used to plan, as well as document, the process for solving instructional problems. The creation of these reports is both prescriptive and reflective, identifying both a plan of action and suggestions for changes based on what the participant has learned as a result

of the experience.

Public presentations: IT Clinic students will present their project for peer review in the Instructional Technology Professional Seminar at the end of the semester. Also, students will be evaluated on their management of client meetings and related presentations.

Development Journal: Students will maintain a project development journal throughout the semester. Entries should be made at least weekly (more often is fine) including a log of project activities, reflection of the week's activities (how such activities contributed toward the project's goals and progress, any setbacks incurred, how they might be overcome, etc.),

Each assessment component is worth 20 percent of your grade. At the end of the semester, each student will meet with the instructor to assess their individual strengths and weaknesses and to propose their own grade for each given area. The negotiation will then begin! This grading process is meant to be open-ended in an effort to match the authentic nature of this course experience.

The Course Process

This experience may best be described as problem-based learning. Typically, the projects we engage in are ill-defined (and that's good!). The roles associated with project development teams will be assigned and alternated every few weeks, giving students the opportunity to both develop areas of weakness and share existing expertise with others. The role of the instructor is that of a facilitator, providing guidance when needed and hopefully leveraging those teachable moments created by project involvement.

Appendix J

Needs assessment report conclusions (see Chapter 6 for other details about the report)

1. (44%) of secondary school teachers have Malawi School Certificate of Education, a qualification that does not qualify them to teach at secondary schools. Majority of these unqualified secondary schoolteachers are in community day secondary schools.

2. Three-quarters of secondary school teachers could be trained and still continue to serve as teachers in secondary schools for more than 10years before they reach the mandatory retirement age of 55 years

3. Income levels of teachers are generally very low and if they were to contribute toward their education, their contribution would be very minimal.

4. There is uneven distribution of teaching-subject specialization in secondary schools.

5. Majority (74%) of prospective student teachers prefer studying at night because during the day they are committed to their teaching work.

6. Most teachers (85%) prefer the print mode of instructional delivery to technological modes.

7. Distance education program to be designed would have to address educational needs of the teachers at diploma, bachelors and masters levels with priority being given to those teachers who are not qualified to teach at secondary schools.

8. The problem of teacher shortage in Malawi would best be solved by introduction of distance teacher education than increasing intake of students studying education courses in universities

9. Mzuzu University will have adequate personnel to design modules and deliver courses by distance when implementation of distance education starts in May 2003. Funds for production laboratory and equipment need to be sourced for proper implementation of the program. The cheapest and most convenient mode of communication in Malawi is postal service. If enough funds were sourced for the distance education program, the Internet would be a valuable mode of delivery of instruction by distance especially in urban areas.

10. Mzuzu University distance education program would benefit a lot from other existing distance education programs in Malawi like the Malawi College of Distance Education and Domasi College of Education’s distance education program, especially in the initial stages of implementation.

Appendix K

UPIC/ ICET Activity – Proposal Goals

Objective One: Professional preparation of Malawian instructional technology leadership cadre through participation in the Virginia Tech Instructional Technology Program.

- Four Malawian students will enroll at the Master's level and one student will enroll at the PhD level in the Instructional Technology Program within the Department of Teaching and Learning on the Blacksburg campus of Virginia Tech. Skills and knowledge of instructional technology will be facilitated through the following channels.
- Engagement in coursework related to developing a foundation in instructional technology as well as the study of specific topics focused on the development and implementation of distance delivered programs. Examples of course titles include instructional design, distance learning, educational computing applications, and multimedia development to name a few.
- Participation in graduate program professional seminars to increase awareness of instructional technology issues and current trends.
- Independent studies with IT faculty to observe and participate in the existing on-line ITMA program development and implementation process.

Objective Two: Begin exploration of the library needs of Mzuzu University.

- Dr ____ will meet with library and digital library experts at Virginia Tech and explore the library facilities and resources on site with the goal of pursuing a later, separate proposal to upgrade library facilities and capabilities at Mzuzu University.

Objective Three: Re-design existing online Instructional Technology Masters Program (ITMA) for delivery in Malawi. Customized re-purposing of the Virginia-based program will occur through the following strategies.

- Virginia Tech IT faculty will conduct a needs analysis with Malawi constituents to determine a re-design approach for the ITMA program in order to meet the needs of Malawi educators.
- The Malawi student team will work with VT IT faculty on the re-design effort for delivery of the online IT program to Malawi.

Objective Four: Implementation and evaluation of ITMA in Malawi. Customized re-purposing of the Virginia-based program will occur through the following strategies.

- Eighty Malawi educators will be selected to participate in the online ITMA program.

- The Virginia Tech IT faculty will begin delivery of the customized ITMA program

- The Malawi student leadership cadre, who studied on the Blacksburg campus, will serve as the instructional facilitators for the distance delivered programming. Responsibilities include grading assignments, corresponding with Malawi program participants, and providing general program support.

- Dr.___ will serve as the on-site program coordinator in Malawi during the implementation stage.

- Formative evaluation will be ongoing throughout the program implementation by an experienced faculty evaluator from Virginia Tech. The evaluator will also conduct a summative evaluation of the program upon its completion.

Appendix L

On-line Educational Psychology course components

L.1 – Site Map

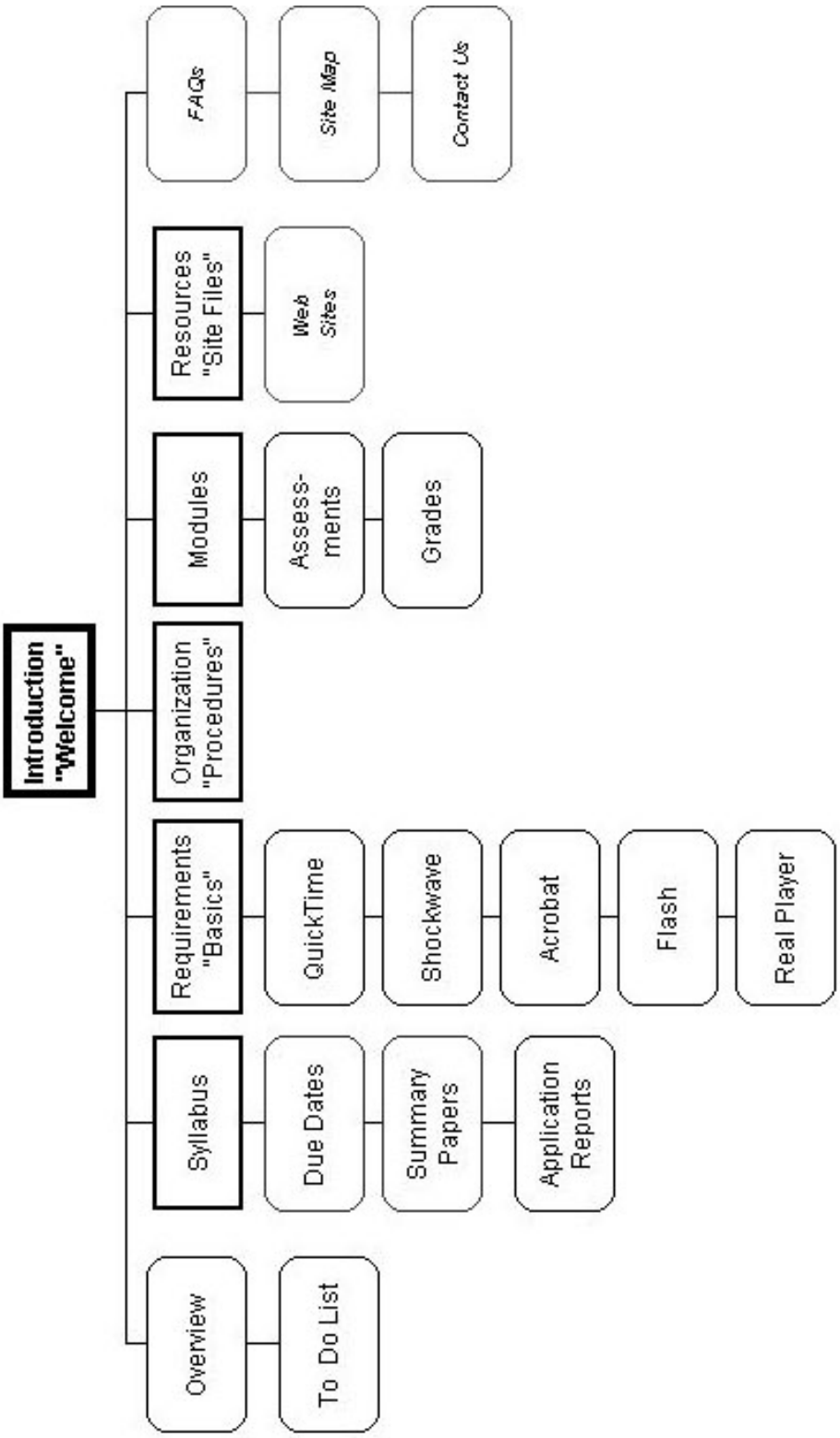
L.2 – Course content

L.3 – Module format

L.4 – Example lesson

Appendix L.1

On-line Educational Psychology course – Site map



Appendix L.2

On-line Educational Psychology course – Course content

Introduction – "Welcome"

Main page: An opening paragraph to welcome students and a list of general goals and objectives.

Overview: Introductory paragraph and the basic content outline

To Do List: A three part check-list that guides students through a course survey, preparation, and completion.

Syllabus

Main page: Follows a typical college syllabus format, listing information about contacting the instructor, office hours, required text, evaluation information, honor code statement, and information for students with disabilities. Includes links to the On-line Wellness Resource Center and the Institute for Distance and Distributed Learning.

Due Dates: a table that lists when assignments are due

Summary Papers: an explanation of the purpose, rationale, format, process, grading procedures and "pragmatics" of the chapter summary assignments (one summary is due for each chapter).

Applications Report: an explanation of the purpose, rationale, format, process, grading procedures and "pragmatics" of the application report assignments (one report is due at the beginning of the course and one at the end).

Requirements – "Basics"

Main page: A lengthy page that explains time requirements, the textbook requirement, computer/modem requirements, web browser requirements, and web-browser plug-in requirements.

Quicktime: Explanation of QuickTime, how it is used in the course, a demonstration of QuickTime, and an explanation of how to download and install the plug-in from Apple.

Shockwave: A note that states this technology is not currently in use in the course.

Acrobat: Explanation of Acrobat, how it is used in the course, a demonstration of Acrobat, and an explanation of how to download and install the plug-in.

Flash: Explanation of Flash, how it is used in the course, a demonstration of Flash, and an explanation of how to download and install the plug-in from Macromedia.

Real Player: Explanation of Real Player, how it is used in the course, a demonstration of Real Player, and an explanation of how to download and install the plug-in from Real Network.

Organization – "Procedures"

Main page: A lengthy page that explains to students the process they should use for successful completion of the course. After an opening paragraph titled "The Big Picture," the outline for the page instructs students to:

1. Read (preview, question, read, reflect, recite, review)
2. Complete web-based activities for each module *
    a. Prerequisites
    b. Objectives
    c. Advance organizer
    d. Audio/Video slideshows
    e. Formative Assessment
    f. Interactive activity
    g. Summative assessment
3. Study
4. Complete summative assessment

Modules

Main page: An outline that organizes the course's 15 modules into 5 units (outline at the end of this appendix). Only the title of the unit and module appear; students must click on the link to go to a web page with the module content.

Assessments: Students must log-in to a database with a user-name and password in order to take the Summative Assessment. The database is maintained by the course creator/instructor on his own web server.

Grades: Students must log-in to a database with a user-name and password in order to see their progress and grades for the course. The database is maintained by the course creator/instructor on his own web server.

Resources – "Site Files"

Main page: This page contains a link to Adobe PDF files for all course content, including PDF files for the first seven chapters of the textbook in the event students cannot obtain it right away.

Web Sites: blank

FAQs: blank

Site Map: blank

Contact Us: blank

Educational Psychology Content Outline

Unit 1 : Course Introduction
- Module 1 : Course Introduction l

Unit 2 : Behaviorism
- Module 2 : Principles and Theories
- Module 3 : Classical Conditioning
- Module 4 : Operant Conditioning
- Module 5 : Social Learning Theory

Unit 3 : Cognition I
- Module 6 : Memory - Overview
- Module 7 : Memory - Storage
- Module 8 : Memory - Knowledge
- Module 9 : Memory - Retrieval
- Module 10 : Memory - Applications I

Unit 4 : Cognition II
- Module 11 : Metacognition and Strategies
- Module 12 : Transfer and Problem Solving
- Module 13 : Memory - Applications II

Unit 5 : Motivation
- Module 14 : Motivation and Affect
- Module 15 : Motivation and Cognition

Appendix L.3

On-line Educational Psychology course – Module format

A description of the course is found in Chapter Six. This table only shows the format of each module in the on-line Educational Psychology course.

Heading or Link	Description
Prerequisites	Reading assignment from Ormrod (1999) text
Objectives	A list of five objectives
Advance Organizer	Text (not more than one or two paragraphs) or a graphic that introduces the lecture.
Audiovisual slideshow *	Streaming audio of lecture (Apple Quicktime format) notes along with a slideshow. This replicates overhead transparencies.
Formative assessment *	A short (3-5 questions) multiple choice quiz. Answers are returned through a web database application. Full feedback is provided after submission of answers and also on the text only pages.
Interactive activity *	An activity created using Macromedia Shockwave. The activity illustrates a point in the module.
Summative assessment	Students registered for the course must submit a user name and password to access the 15 question multiple-choice quiz for each module. They receive immediate feedback on their performance.

** The links to the slideshow, the formative assessment, and interactivity are accompanied in each case by a link to "Text and Graphics Only" or "Text Only."*

Appendix L.4

On-line Educational Psychology course – Example module
(Except for font face and graphics, this replicates the web-based version)

Introduction	**Syllabus**	**Requirements**	**Organization**	Modules	**Resources**

Modules

Assessments

Grades

Modules
Classical Conditioning

Prerequisites:

Prior to completing the web-based portion of this module you should have read Chapters 2 and 3 in the Ormrod text.

Objectives:

1. The student will be able to discuss the various assumptions that underlie behaviorism.
2. The student will be able to explain the basic classical conditioning model.
3. The student will be able to analyze and explain a behavioral scenario based on the classical conditioning model.
4. The student will be able to explain a variety of basic concepts that are related to the basic classical conditioning model.
5. The student will be able to apply the classical conditioning model to the explanation and control of human behavior.

Advance Organizer:

Behaviorism deals primarily with the construction of associations between stimuli and responses. These responses are often emotional responses. Often we associate a particular smell with a person. For example, if your friend or lover wears a particular perfume or cologne, then often when you smell that perfume or cologne when in the mall you will immediately think of your friend or lover. Think of three things that you either really like or really dislike (e.g., food, colors, places, people). Then, try to think about the associate that you made that explains your feelings (e.g., I like my cat because she purrs and plays with me, or I hate my cat because she scratches and bites me).

Audio/Video Slideshow:

Below is a link to an audio/video slide show. The slideshow discusses an important topic from the Chapter(s). You may find it advantageous to write a few notes during the slideshow. If you have a slow connection or are unable to run the slideshow, you may view the slides and read the text statically by selecting the [Text and Graphics Only] link.

Slideshow ❶

[Text & Graphics only]

[Text only]

Formative Assessment:

Below is a link to a series of formative assessment questions. The formative assessment will allow you to gauge your progress and to gain knowledge relative to the types of questions that may be asked on the summative assessment. The text of the formative assessments is also available by selecting the [Text and Grapics Only] link.

Formative Assessment

[Text & Graphics Only]

[Text Only]

Interactive Activity:

Below is a link to an activity that requires cognitive interaction with the activity. Read the directions carefully and engage the activity fully. This interaction is designed to stimulate thought and inquiry into a specific concept from the current Chapter. A text description of the interactive activity is also available by selecting the [Text and Grapics Only] link.

Interactive Activity

[Text & Graphics Only]

[Text Only]

Summative Assessment:

Click on the button below to take the summative assessment for this lesson.
Note: Clicking this button will take you off this site.

This assessment consists of 15 multiple-choice questions. In completing the assessment, students are allowed to use their notes and their book, but may not utilize the assistance of another person. Upon completion of the assessment you will be provided with feedback relative to the number of questions that you answered correctly. Each quiz may only be taken once. If you have any questions regarding an assessment, please contact _____.

Take quiz

Appendix M

Print-based Educational Psychology course components

M.1 – Table of contents

M.2 – Example lesson

Appendix M.1

Print-based Educational Psychology – Table of contents

I. Course Information
- A. Introduction
- B. General Goals & Objectives
- C. Overview
- D. Basic Content Outline

II. Syllabus
- A. Required Text
- B. Course Goals
- C. Course Implementation
- D. Evaluation
- E. Grading

III. Due Dates
- A. Dates
- B. Examination Conduct

IV. Procedure for Course Completion
- A. The Big Picture
- B. Approach to Reading
  1) Preview
  2) Question
  3) Read
  4) Reflect
  5) Recite
  6) Review
- C. Read through Supplementary Notes
  1) Prerequisites
  2) Objectives
  3) Advance Organizer
  4) Supplementary Notes
  5) Formative Assessment
- D. Study
- E. Chapter Summaries
- F. Complete Summative Assessment

V. Chapter Summaries

A. Purpose
B. Rationale
C. Format
D. Summarizing Process
E. Grading
F. Pragmatics
G. Timeline

VI. Applications Report

A. Purpose
B. Rationale
C. Format
   1) Application Report 1
   2) Application Report 2
D. Grading
E. Pragmatics
F. Timeline

VII. Modules

There are 14 modules divided into four units. A module may correspond to one or two chapters in the course textbook.

Unit 1: Behaviorism
- Module 1: Principles and Theories
- Module 2: Classical Conditioning
- Module 3: Operant Conditioning
- Module 4: Social Learning Theory

Unit 2: Cognition I
- Module 5: Memory - Overview
- Module 6: Memory - Storage
- Module 7: Memory - Knowledge
- Module 8: Memory - Retrieval
- Module 9: Memory - Applications I

Unit 3: Cognition II
- Module 10: Metacognition and Strategies
- Module 11: Transfer and Problem Solving
- Module 12: Memory - Applications II

Unit 4: Motivation
- Module 13: Motivation and Affect
- Module 14: Motivation and Cognition

*** All modules follow the template shown below:**

- Prerequisites
- Objectives
- Advance Organizer
- Supplementary Notes
- Formative Assessment (3 multiple choice questions)
- Formative Assessment Solution (correct answer given along with explanation of the question)

Appendix M.2

Print-based Educational Psychology – Example lesson (excerpt)

In places where [cut] *appears, information has been cut only for the purpose of abbreviating the module for this appendix.*

Module 2: Classical Conditioning

Prerequisites

Prior to completing this portion of this module you should have read Chapters 2 and 3 in the Ormrod textbook.

Objectives

At the end of this section, the student will be able to:

1. Discuss the various assumptions that underlie behaviorism.
2. Explain the basic classical conditioning model.
3. Analyze a behavioral scenario based on the classical conditioning model.
4. Explain a behavioral scenario based on the classical conditioning model.
5. Explain a variety of basic concepts that are related to the basic classical conditioning model.
6. Apply the classical conditioning model to the explanation and control of human behavior.

Advance Organizer

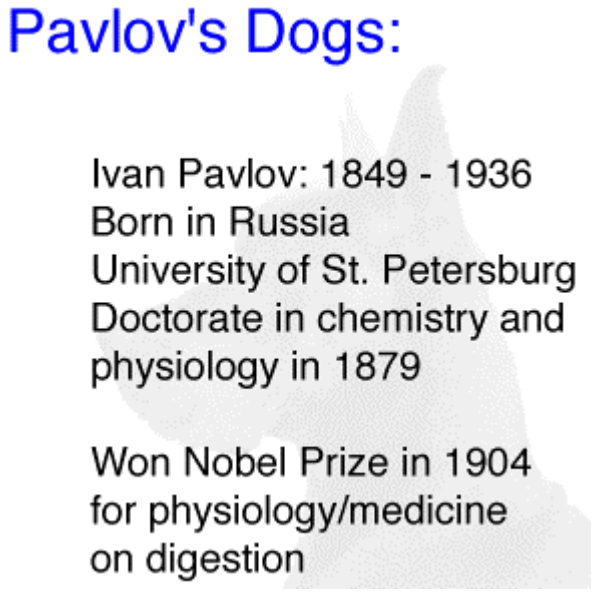
Behaviorism deals primarily with the construction of associations between stimuli and responses. These responses are often emotional responses. Often we associate a particular smell with a person. For example, if your friend or lover wears a particular perfume or cologne, then often when you smell that perfume or cologne when in the shopping centre you will immediately think of your friend or lover. Think of three things that you either really like or really dislike (e.g., food, colors, places, people). Then, try to think about the association that you made that explains your feelings (for example, I like my cat because she purrs and plays with me, or I hate my cat because she scratches and bites me).

Supplementary Notes

Classical Conditioning: The Basic model

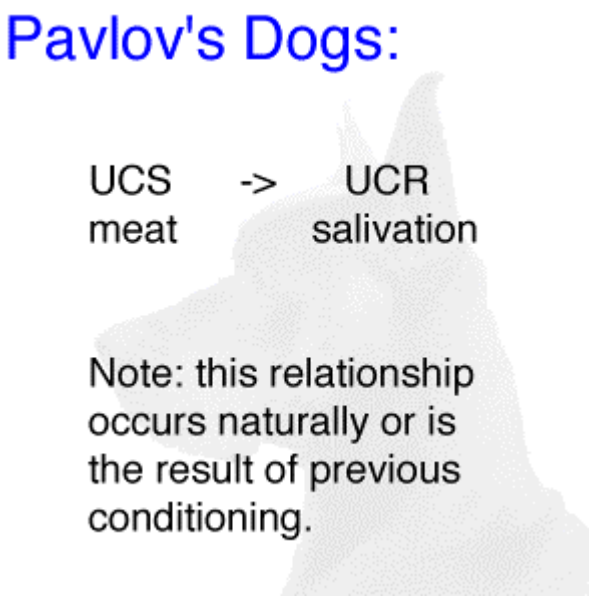
Welcome, today we are going to talk about classical conditioning. What we would like to do first, is to discuss or review, Pavlov's basic model of classical conditioning, and then provide you with an example of how this conditioning can relate to humans and human conditioning.

The first thing to keep in mind is that Pavlov was not actually a psychologist, he was a noble prize-winning physiologist, and he was working on a series of experiments, where he was investigating the digestion of dogs, and specifically, the processes of salivation.



Pavlov began to notice that during his experiments, the dogs would begin to salivate even before the meat food or food powders were presented to them. And over the next couple years, he began to research why that might occur. So if we take a look at Pavlov and his super dogs, we will be able to extract the basic model that Pavlov came up with.

So let us start off with the dogs and their food. For Pavlov, the food naturally elicited salvation, and so Pavlov called this the unconditioned stimulus and the unconditioned response. What is key about this relationship is that it is a naturally occurring pairing or something that has been previously conditioned. And so the dog is presented with meat, the dog salivates, that is a natural occurrence.



[cut]

Formative Assessment

Below is a series of formative assessment questions in multiple-choice format. The formative assessment will allow you to gauge your progress and to gain knowledge relative to the types of questions that may be asked on the summative assessment for the unit. First attempt to answer the questions on your own and after you have answered all the questions compare your answers with the correct ones overleaf. If your answer was

different, reflect on your thinking and determine why your answer varied from the correct answer. You may need to re-read parts of the textbook.

1. Which of the following is NOT an assumption of behaviorism?

   a. Once behaviors have been identified the underlying mental constructs must be addressed.
   b. Learning is learning; the principles of learning apply to humans and other species alike.
   c. Learning is only indicated when there has been an observable change in behavior.
   d. The study of learning involves the study of stimuli and responses.

[cut]

Formative Assessment Solution

1. The correct answer was **a**

Question Explanation: Behaviorism is based on the concept that the only objective data available for study, relative to psychology, is behavior. The idea that mental constructs are available for study is contrary to the very core of behaviorism. According to behaviorism, mental constructs are beyond our ability to observe and measure and thus are not viable candidates for study.

[cut]

Appendix N

On-line Instructional Design course components

N.1 – Site Map

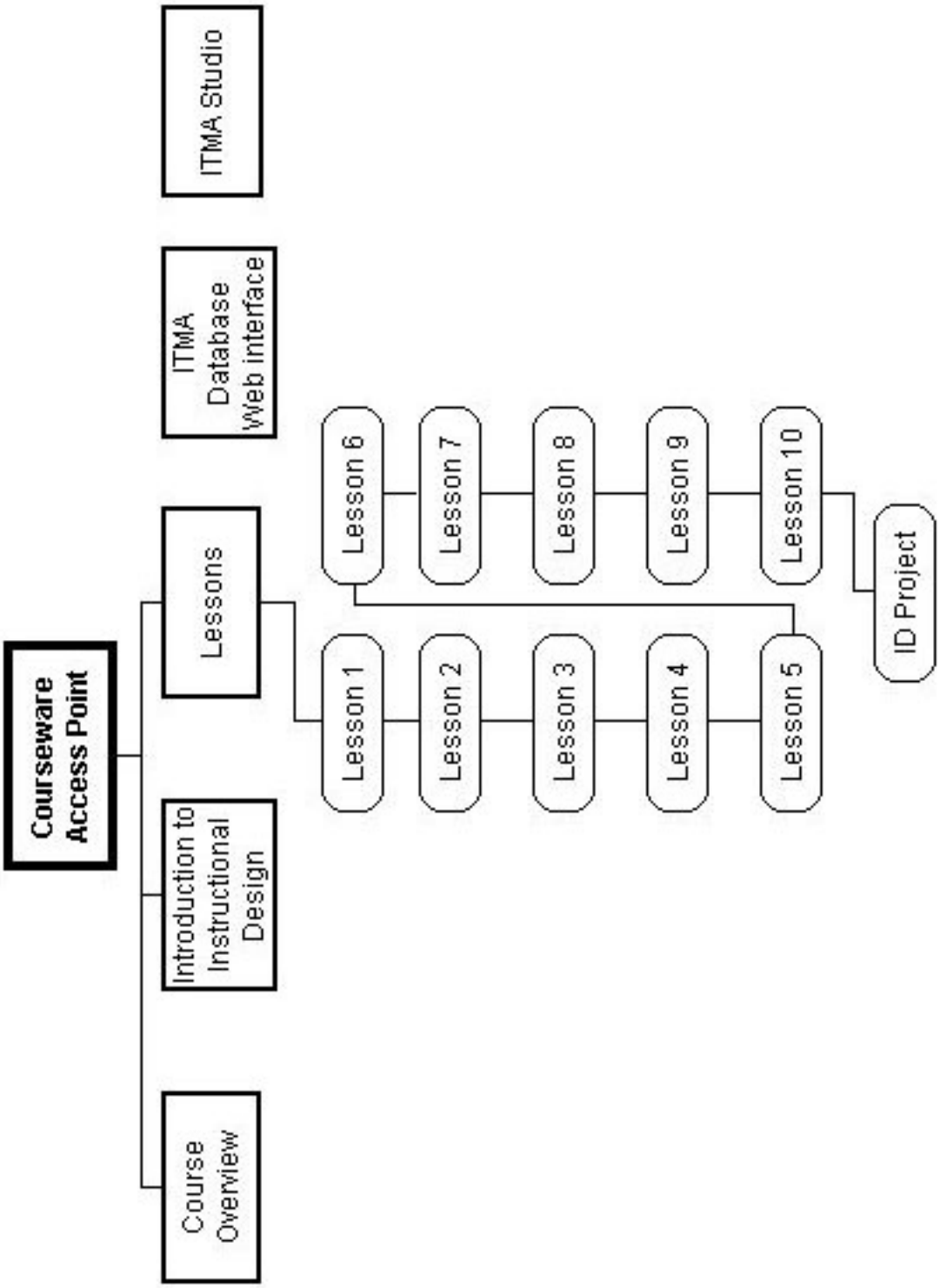
N.2 – Course content

N.3 – Module format

N.4 – Example lesson

Appendix N.1

On-line Instructional Design course – Site map



Appendix N.2

On-line Instructional Design course – Course content

Course Overview

The Course Overview provides students with the following information:

- Course objectives (20 are listed)
- Required text
- Assignments and grading
- Submitting activities
- Schedule
- Support

Introduction to Instructional Design

A few paragraphs introducing students to basic concepts of instructional design, as well as underlying assumptions in the field.

Lessons

There are ten lessons in the Instructional Design course and an additional web page that details the final ID project. The titles of the lessons are:

Lesson 1: Overview of Design
Lesson 2: Needs Assessment
Lesson 3: Instructional Analysis, pt. 1
Lesson 4: Instructional Analysis, pt. 2
Lesson 5: Learner and Context Analysis
Lesson 6: Writing Objectives
Lesson 7: Assessment Instruments
Lesson 8: Instructional Strategy
Lesson 9: Development
Lesson 10: Formative Evaluation

ITMA Database Web Interface

The ITMA Database was created to serve a number of administrative functions for all ITMA courses. The database works with a combination of HTML and Cold Fusion coding and is hosted on a large server in Virginia Tech's computing center. The server is maintained 24 hours a day, all year long. As it concerns student use, the database interface allows students to upload assignments, receive feedback on assignments, communicate with graders, and view their progress through the program.

ITMA Studio

Main page: The ITMA Studio is essentially an in-depth "self-help" site that serves as proxy support for all ITMA courses. The major areas of the Studio are:

Help: General help and contact information for the ITMA program

Portfolio: Overview and list of portfolio components

Tools: Tools (software; web links) for instructional design and development

Tutorials: Brief tutorials on how to use a variety of basic software to create electronic ID products

Students: A list of links to past student portfolios

Chat: A Java-enabled chat room that allows students to talk with one another (not widely used)

News: A place for ITMA news (not widely used; most announcements go out over e-mail).

Appendix N.3

On-line Instructional Design course – Module format

A description of the course is found in Chapter Six. This table only shows the format of each module in the on-line Instructional Design course.

Heading	**Description**
Lesson (#) Readings	Chapter assignment from the Dick & Carey (2001) book.
Background information	An advance organizer for the lesson.
Lecture headings	Each paragraph in the "lecture" is given a heading; these change depending on the topic.
Activity description	Text that explains a student's assignment.
Submission directions	Text that explains how a student should submit his/her assignment.

Appendix N.4

On-line Instructional Design course – Example module
(This replicates the web-based version)

Assignments

Top

Lesson 9 – Development

Lesson 9 Readings

- Read Chapter 9, Developing Instructional Materials, from Dick and Carey

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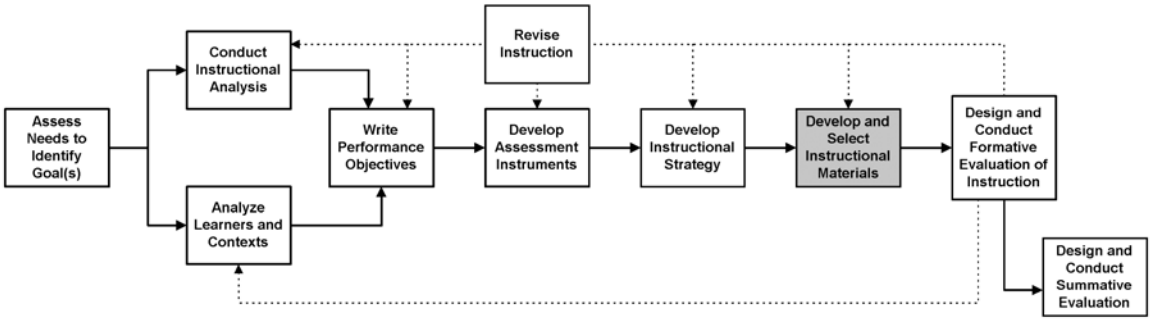
Background Information

Due to the timeframe of this course, you will not be developing your instructional materials at this time. As such, we will limit our discussion here. However, you will have opportunities to complete work on your instructional design project as you progress through the ITMA program; in future modules you will acquire skills that will aid you in developing and formatively evaluating your materials.



If you've completed all of the steps up to this point, take a moment to stop and reflect on your progress. Look at the model above and you will see that you have essentially completed the design stage of instructional design. What remains is to develop (create) your instructional materials, try them out, make any necessary revisions, and then implement your instruction. In the development stage of instructional design, you either select existing instructional materials, develop your own instructional materials, or create specifications for someone else to develop them. At the end of the development process you should have a completed instructional package that includes your instructional materials, assessment instruments, and course management information.

Instructional Design Project Part Six

Even though you will not actually develop your instructional materials in this course, we want you to give some thought to the process you would undertake to develop your materials. In this activity you will begin working on Part Six of your ID Project. Part Six will be comprised of the activities from Lessons 9 and 10, so you will not turn this part in until after Lesson 10. After reading Chapter 9 in the book, briefly answer the following questions regarding the development of your instructional materials. Please answer each question separately:

1. Are existing materials available that will match up with your instructional strategy? If so, describe them. Keep in mind that even if there are existing materials in your content area they may not match up with your objectives. If there are no materials available that can be adopted or adapted for your instructional strategy, you will have to develop the materials yourself.

2. Think about the delivery system you chose, and the types of media you specified in your instructional strategy. With that in mind, describe the types of instructional materials that you will have to develop. This might be lecture notes, handouts, worksheets, PowerPoint presentations, multimedia programs, and/or formal tests. What materials or products might you use to develop them? Will you need to use any special software or equipment? You may need to go back and modify your original decisions to reflect any existing materials you have found, the realities of development and production costs, and any other new thoughts you may have about the process.

3. What will your role be in the development of the instruction? In some cases the designer is not the same person who will develop the instruction. In many instructional projects the designer prepares the design documents and then hands them over to a team of developers, who then develop the instructional materials to those specifications. Are the developmental tasks you have specified "doable" by you? Or, will you seek outside help? If you are a teacher you are probably laughing at the thought of having outside help, however, you may know of somebody who can help you with your web pages, graphics, video production, or computer coding. Also, keep in mind that throughout this program you will acquire additional skills that will help you create web pages, graphics, audio, and video, so don’t underestimate your abilities.

4. What will your role be in the delivery of the instruction? In some cases the designer is not the same person who will deliver the instruction. In many instructional projects the finished materials are given to an entirely different person or persons for delivery to the learners. Are you the instructor, or will you hand over your completed instructional materials to someone else? If you are the instructor, will you have an active (teaching) role in the delivery of the materials, or will the students learn on their own? Also, how much guidance will you provide as an instructor? Or, perhaps your materials will be delivered independently of an instructor (e.g., video or computer-based)? If this is the case then all of the learning components and events will have to be included within the instructional materials.

5. Considering your required materials, what types of rough draft versions could you produce to try out before developing your full-blown materials? When developing your instructional materials, it is best to first develop a rough draft to use in a formative evaluation procedure. These materials should be a low-cost version of your design that can be delivered to a subject matter expert, several learners, or a small group of learners for tryout. Based on these experiences you can then proceed to develop your full-blown materials.

When you have addressed each of these questions, write a summary describing your developmental needs, your role in the development process, and an idea of how you might develop a rough draft of your materials.

Submitting Part Six of Your ID Project

Part Six of your ID Project should be typed up in Microsoft Word. At the top of the paper type "ID Project Part Six: Development and Formative Evaluation". Underneath that include your name, email address, and the date. When you save the file name it "development.doc". You will continue to work on Part 6 of your ID Project in Lesson 10, so *do not submit it in until then.*

Assignment: ID Project Part Six
Points: 5

Grading Criteria:

- Describes any existing materials that might match up with their instructional strategy. (.5)
- Describes the materials that will have to be developed, along with any special software or equipment required for their development. (.5)
- Describes their role in the development process. Will they develop all of the materials by themselves? If not, describes any outside help they will seek. (.5)
- Describes their role in the delivery process. Are they the instructor? Also, describes the amount of guidance that will be provided to the learners. (.5)
- Describes the types of rough draft materials they might produce to try out prior to full-blown development. (.5)
- Summary that describes their developmental needs, their role in the development process, and how they might develop a rough draft of their materials. (2.5)

Appendix O

Print-based Instructional Design course components

O.1 – Table of contents

O.2 – Example lesson

Appendix O.1

Print-based Instructional Design – Table of contents

Lesson 1: Overview of Design

(all lessons follow the general format below)

- Readings (assigned text readings)
- Background Information (notes on the reading)
- Assignment submission instructions (includes grading rubric)

Lesson 2: Needs Assessment

Lesson 3: Instructional Analysis, Part I

Lesson 4: Instructional Analysis, Part II

Lesson 5: Learner and Context Analysis

Lesson 6: Writing Objectives

Lesson 7: Assessment Instruments

Lesson 8: Instructional Strategy

Lesson 9: Development

Lesson 10: Formative Evaluation

Appendix O.2

Print-based Instructional Design – Example lesson

In places where [cut] *appears, information has been cut only for the purpose of abbreviating the module for this appendix.*

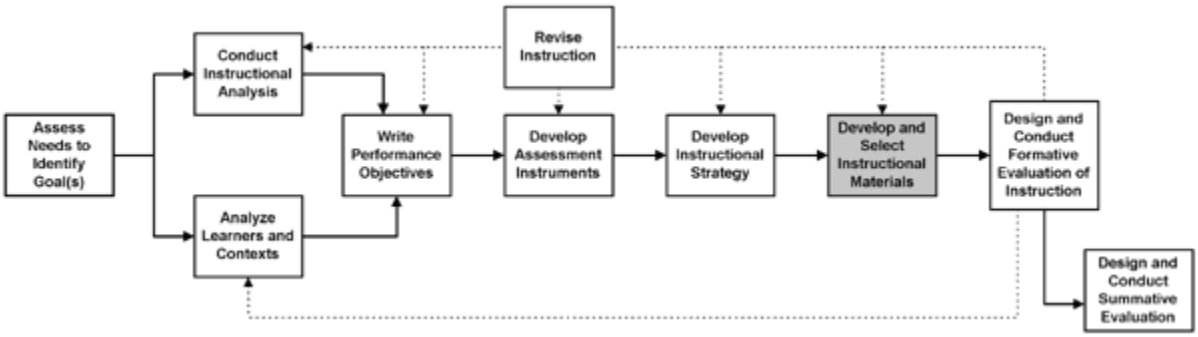
Lesson 9 - Development

Lesson 9 Readings

- Read Chapter 9, Developing Instructional Materials, from Dick and Carey

Background Information

Due to the timeframe of this course, you will not be developing your instructional materials at this time. As such, we will limit our discussion here. However, you will have opportunities to complete work on your instructional design project as you progress through the ITMA program; in future modules you will acquire skills that will aid you in developing and formatively evaluating your materials.



If you've completed all of the steps up to this point, take a moment to stop and reflect on your progress. Look at the model above and you will see that you have essentially completed the design stage of instructional design. What remains is to develop (create) your instructional materials, try them out, make any necessary revisions, and then implement your instruction. In the development stage of instructional design, you either select existing instructional materials, develop your own instructional materials, or create specifications for someone else to develop them. At the end of the development process you should have a completed instructional package that includes your instructional materials, assessment instruments, and course management information.

Instructional Design Project Part Six

Even though you will not actually develop your instructional materials in this course, we want you to give some thought to the process you would undertake to develop your materials. In this activity you will begin working on Part Six of your ID Project. Part Six will be comprised of the activities from Lessons 9 and 10, so *you will not turn this part in until after Lesson 10*.

After reading Chapter 9 of the book, *briefly* answer the following questions regarding the development of your instructional materials. Please answer each question separately:

1. Are existing materials available that will match up with your instructional strategy? If so, describe them. Keep in mind that even if there are existing materials in your content area they may not match up with your objectives. If there are no materials available that can be adopted or adapted for your instructional strategy, you will have to develop the materials yourself.

2. Think about the delivery system you chose, and the types of media you specified in your instructional strategy. With that in mind, describe the types of instructional materials that you will have to develop. This might be lecture notes, handouts, worksheets, PowerPoint presentations, multimedia programs, and/or formal tests. What materials or products might you use to develop them? Will you need to use any special software or equipment? You may need to go back and modify your original decisions to reflect any existing materials you have found, the realities of development and production costs, and any other new thoughts you may have about the process.

3. What will your role be in the development of the instruction? In some cases the designer is not the same person who will develop the instruction. In many instructional projects the designer prepares the design documents and then hands them over to a team of developers, who then develop the instructional materials to those specifications. Are the developmental tasks you have specified "doable" by you? Or, will you seek outside help? If you are a teacher you are probably laughing at the thought of having outside help, however, you may know of somebody who can help you with your web pages, graphics, video production, or computer coding. Also, keep in mind that throughout this program you will acquire additional skills that will help you create web pages, graphics, audio, and video, so don’t underestimate your abilities.

4. What will your role be in the delivery of the instruction? In some cases the designer is not the same person who will deliver the instruction. In many instructional projects the finished materials are given to an entirely different person or persons for delivery to the learners. Are you the instructor, or will you hand over your completed instructional materials to someone else? If you are the instructor, will you have an active (teaching) role in the delivery of the materials, or will the students learn on their own? Also, how much guidance will you provide as an instructor? Or, perhaps your materials will be delivered independently of an instructor (e.g., video or computer-based)? If this is the case then all of the learning components and events will have to be included within the instructional materials.

[cut]

Submitting Part Six of Your ID Project

Part Six of your ID Project should be typed up in Microsoft Word. At the top of the paper type "ID Project Part Six: Development and Formative Evaluation". Underneath that include your name, email address, and the date. When you save the file name it "development.doc". You will continue to work on Part 6 of your ID Project in Lesson 10, so *do not submit it in until then*.

Assignment: ID Project Part Six
Points: 5

Grading Criteria:

- Describes any existing materials that might match up with their instructional strategy. (.5)
- Describes the materials that will have to be developed, along with any special software or equipment required for their development. (.5)
- Describes their role in the development process. Will they develop all of the materials by themselves? If not, describes any outside help they will seek. (.5)
- Describes their role in the delivery process. Are they the instructor? Also, describes the amount of guidance that will be provided to the learners. (.5)
- Describes the types of rough draft materials they might produce to try out prior to full-blown development. (.5)
- Summary that describes their developmental needs, their role in the development process, and how they might develop a rough draft of their materials. (2.5)

Appendix P

On-line Instructional Media course components

P.1 – Site Map

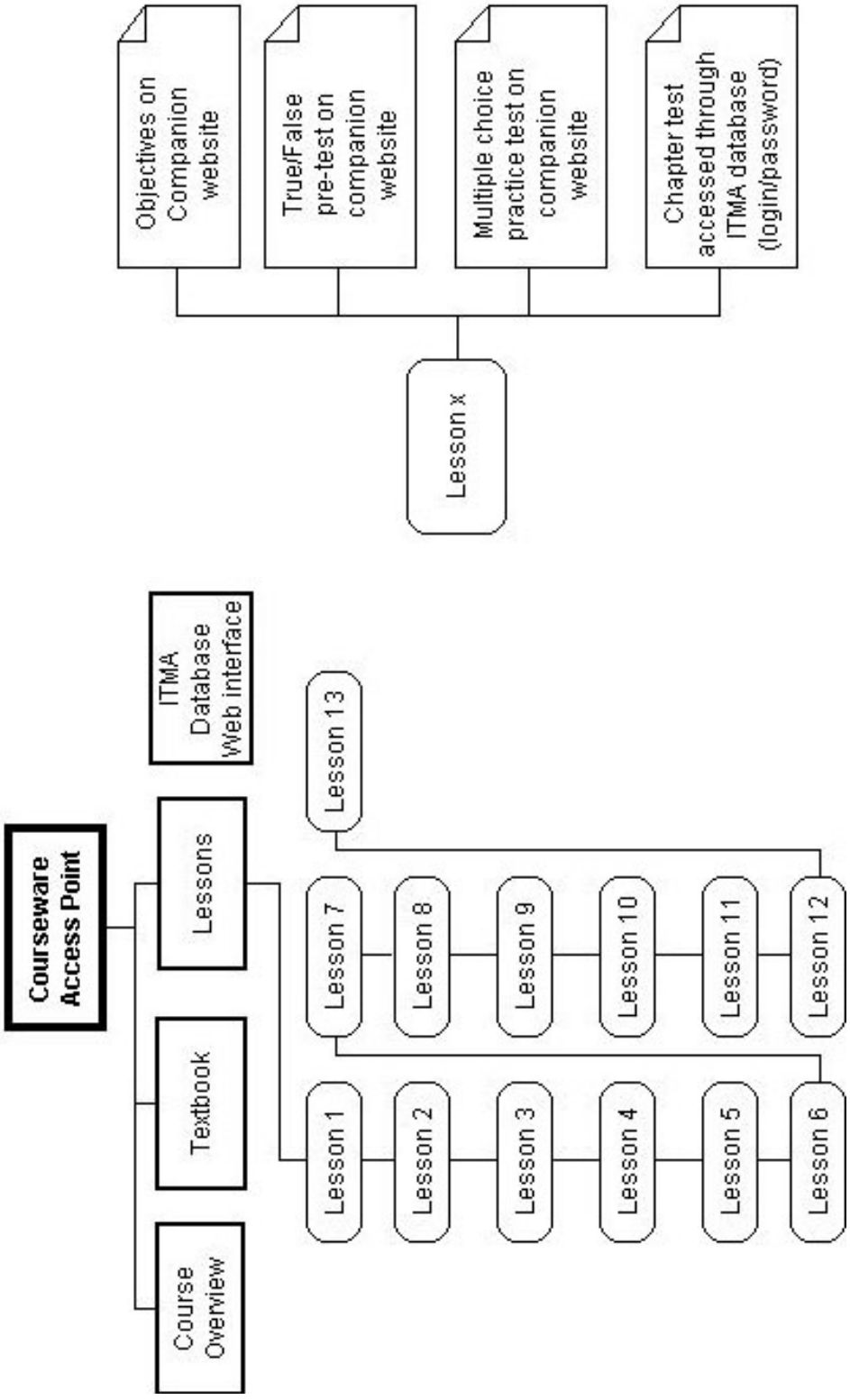
P.2 – Course content

P.3 – Module format

P.4 – Example lesson

Appendix P.1

On-line Instructional Media course – Site map



Appendix P.2

On-line Instructional Media course – Course content

Course Overview

The Course Overview provides students with the following information:

- Introduction (including course goals)
- Chapter assignments and tests
- Assignment due dates
- Grading
- Honor code
- Questions (link to an ITMA e-mail address)

Textbook

A page that explains which textbook to purchase and how to obtain it. It explains that the course contains web links to the publisher's web site.

Lessons

There are 13 lessons in the Instructional Media course. The titles of the lessons are:

Lesson 1: Media, Technology, and Learning
Lesson 2: Technologies for Learning
Lesson 3: The ASSURE Model
Lesson 4: Media and Material
Lesson 5: Visual Principles
Lesson 6: Visuals
Lesson 7: Audio
Lesson 8: Video
Lesson 9: Computers
Lesson 10: Multimedia
Lesson 11: Internet and Intranets
Lesson 12: Distance Learning
Lesson 13: Looking Ahead

ITMA Database Web Interface

The ITMA Database was created to serve a number of administrative functions for all ITMA courses. The database works with a combination of HTML and Cold Fusion coding and is hosted on a large server in Virginia Tech's computing center. The server is maintained 24 hours a day, all year long. As it concerns student use, the database interface allows students to upload assignments, receive feedback on assignments, communicate with graders, and view their progress through the program.

Appendix P.3

On-line Instructional Media course – Module format

A description of the course is found in Chapter Six. This table only shows the format of each module in the on-line Instructional Media course.

Heading	**Description**
Introduction	No more than about two short paragraphs.
Objectives	This is a link to the textbook's companion website.
Pretest	Link to a True/False web-based quiz that offers immediate feedback.
Reading	Assigned reading from class-text.
Practice Quiz	A link to a multiple choice quiz on the companion website.
Chapter Test	A link to an ITMA database tool that allows students to log-in and complete a multiple choice test for the chapter they've just completed (this can only be done one time).
Integration activity	Offers students the possibility of completing one of two written assignments.
Submitting your activity	Provides instructions on what kind of document to submit and also provides students with the rubric that will be used to evaluate their work.
Grading Criteria	The rubric to be used for evaluating student work. It shows how many points are associated with each segment of both integration activities.

On-line Instructional Media course – Example module
(This replicates the web-based version)

Assignments

Top

Lesson 6: Visuals

Introduction

This chapter helps teachers, trainers, etc. effectively utilize various types of visuals. Nonprojected visuals such as models, multimedia kits, posters, and exhibits can be used to make abstract ideas more concrete and understandable and to make learning more realistic. In Dale's Cone of Experience, the use of real objects rank near the bottom of the cone indicating that it is one of the best ways of introducing learners to information for which they have little prior knowledge or experience. Also included in this diverse category are field trips, bulletin boards, chalkboards, and printed materials. Each category opens discussion on advantages and limitations, and offers suggestions for practical and creative uses in the classroom. Many of the fundamental tools available to instructors can also be categorized as projected visuals. Overhead projectors, slides, and filmstrips have been assisting instruction for many years and will continue as viable tools as we face the needs in the future. Projected visuals allow the teacher to design and create materials that meet their particular subject needs and individual preferences. In addition to nonprojected visuals, this chapter focuses on the characteristics and applications of several projected visual formats.

Assignment

For this assignment you will need to complete these activities in order:

1. **Objectives:** Visit the Companion Website Here you will read the chapter objectives.

2. **Pretest:** Take the true/false quiz as a pretest of your prior knowledge. After submitting your answers to the quiz, ignore the "Routing Information" box at the bottom of the screen, unless you want to send the results to yourself.

3. **Reading:** Read "Visuals" (p.140-169) in your text, Instructional Media and Technologies for Learning.

4. **Practice Quiz:** Return to the Companion Web site to take the multiple choice quiz. This will be an excellent review for the chapter test. After submitting your answers to the quiz, ignore the "Routing Information" box at the bottom of the screen, unless you want to send the results to yourself.

5. **Chapter Test:** When you feel confident that you have mastered the Objectives of Chapter 6, log in to the student interface. Once you have logged in to the interface, select Instructional Media from the module drop down menu. Next, select "take a quiz" from the student options drop down menu, and then click the submit button. On the next screen, select the appropriate quiz from the drop down menu and click the submit button. You are only allowed to take each test one time. Therefore, do not begin a test until you are definitely ready to take it! Once you have clicked on the submit button you will be listed as having taken that test EVEN IF you do not answer any of the questions. Also, be aware that the tests in this module should be taken closed-book and without benefit of (1)printed copies of the practice exams, (2)consultation with other students, or (3)any other aid.

6. **Integration Activity:** Complete one of the following Integration Activities: (You do **not** have to go to the Companion Web site to complete this activity. Once you have completed the activity, save it as "activity6-1" or "activity6 -2" (depending on which you select to complete) and place it in your filebox. Remember, this assignment should be a separate web page (an htm or html document).

    1. Think about how you might use PowerPoint to create a presentation or printed transparencies. Then, create a short presentation or set (at least 5 slides) of transparencies in PowerPoint, keeping in mind the design principles discussed on page 167 of your book. Transfer the PowerPoint file to your **instrmed** folder. On your activity web page indicate the purpose and possible use for the transparencies, and include a link from there to the PowerPoint file.

    2. Using the ASSURE model, develop a lesson incorporating a filmstrip, slideshow, video, or other form of projected media. For an example, review the "Blueprint" on page 168 at the end of Chapter 6. In the lesson include at least three specific examples you will use to elicit learner participation during and/or after viewing a projected visual.

Submitting Your Activity

The test results will automatically be graded and submitted. In addition, you should create a separate web page for the Integration Activity you complete from this chapter. At the top of the web page, type the title "Assignment 6- Visuals". Underneath that include your name, email address, and the date. Beneath the heading, paste the instructions for the activity - you can copy them straight from this chapter page by highlighting the text and selecting **Edit|Copy**, and then going to your activity page and selecting **Edit|Paste**. Below the instructions write your response to the activity. When you are finished publish your activity page to your **instrmed** folder on the Filebox server. You can refer back to the filebox homepage in case you need instructions. Next, use the submission form to let the graders know that you have an activity to grade. When submitting an activity, enter the URL for that activity page.

Assignment: Visuals
Points: 15

Grading Criteria:

Activity 6-1

- Appropriately sized fonts. (2)
- Font face is easily read. (2)
- Graphics are appropriate for content. (2)
- Clearly communicates message. (2)
- Colors are clearly contrasting. (2)
- Overall technical quality. (2)
- Indication of purpose & possible use. (3)
- URL does not function properly. (-3)

Activity 6-2

- Title of lesson stated. (1)
- (A) Clear description of learners. (2)
- (S) Objectives clearly stated. (2)
- (S) Methods, media, materials stated. (2)
- (U) Description of how materials will be used w/in the lesson and how the learners will be prepared. (2)
- (R) Describe how learners will participate. (2)
- (E) How will the quality of the lesson be evaluated? (2)
- Grader's discretion. (2)

Appendix Q

Print-based Instructional Media course components

Q.1 – Table of contents

Q.2 – Example lesson

Appendix Q.1

Print-based Instructional Design – Table of contents

Learner's Guidebook

I. Course Information

A. Course Overview
B. Introduction
C. Chapter Assignments and Tests
D. Tests and Assignment Due Dates
E. Grading
F. Honor Code
G. Questions

II. Assignments

A. Lesson 1: Media, Technology, and Learning
(all subsequent chapters follow the instructional sequence shown for this lesson)
   1) Introduction
   2) Assignment
   3) Objectives
   4) Pretest
   5) Reading
   6) Practice Quiz
   7) Chapter Test
   8) Integration Activity
   9) Submitting your Activity
   10) Grading Criteria

B. Lesson 2: Technologies for Learning
C. Lesson 3: The ASSURE Model
D. Lesson 4: Media and Material
E. Lesson 5: Visual Principles
F. Lesson 6: Visuals
G. Lesson 7: Audio
H. Lesson 8: Video
I. Lesson 9: Computers
J. Lesson 10: Multimedia
K. Lesson 11: Internet and Intranets
L. Lesson 12: Distance Learning
M. Lesson 13: Looking Ahead

Learner's Practice Test Book

Pre-tests (True/False) and Practice Quizzes (multiple choice)

Chapter 1: Media, Technology, and Learning
True/False (6 questions); Multiple choice (11 questions)

Chapter 2: Technologies for Learning
True/False (7 questions); Multiple choice (9 questions)

Chapter 3: The ASSURE Model
Multiple choice (12 questions)

Chapter 4: Media and Material
True/False (3 questions); Multiple choice (3 questions)

Chapter 5: Visual Principles
True/False (9 questions); Multiple choice (9 questions)

Chapter 6: Visuals
True/False (6 questions); Multiple choice (6 questions)

Chapter 7: Audio
True/False (2 questions)
Multiple choice (5 questions)

Chapter 8: Video
True/False (9 questions); Multiple choice (10 questions)

Chapter 9: Computers
True/False (6 questions); Multiple choice (13 questions)

Chapter 10: Multimedia
True/False (5 questions); Multiple choice (11 questions)

Chapter 11: Internet and Intranets
Multiple choice (3 questions)

Chapter 12: Distance Learning
True/False (3 questions); Multiple choice (3 questions)

Chapter 13: Looking Ahead
Multiple choice (3 questions)

Answers

Lesson 1 – 13. Answers only (no feedback on correct or incorrect items) for both True/False items and for multiple choice practice quizzes.

Chapter Tests (no answers provided; to be administered at test centers)

Multiple choice tests for lessons 1-13.

Lesson 1: Media, Technology, and Learning (20 questions)

Lesson 2: Technologies for Learning (18 questions)

Lesson 3: The ASSURE Model (27 questions)

Lesson 4: Media and Material (15 questions)

Lesson 5: Visual Principles (19 questions)

Lesson 6: Visuals (22 questions)

Lesson 7: Audio (16 questions)

Lesson 8: Video (20 questions)

Lesson 9: Computers (25 questions)

Lesson 10: Multimedia (24 questions)

Lesson 11: Internet and Intranets (16 questions)

Lesson 12: Distance Learning (18 questions)

Lesson 13: Looking Ahead (15 questions)

Appendix Q.2

Print-based Instructional Media – Example lesson (appears in its entirety)

Lesson 6: Visuals

Introduction

This chapter helps teachers, trainers, etc. effectively utilize various types of visuals. Nonprojected visuals such as models, multimedia kits, posters, and exhibits can be used to make abstract ideas more concrete and understandable and to make learning more realistic. In Dale's Cone of Experience, the use of real objects rank near the bottom of the cone indicating that it is one of the best ways of introducing learners to information for which they have little prior knowledge or experience. Also included in this diverse category are field trips, bulletin boards, chalkboards, and printed materials. Each category opens discussion on advantages and limitations, and offers suggestions for practical and creative uses in the classroom.

Many of the fundamental tools available to instructors can also be categorized as projected visuals. Overhead projectors, slides, and filmstrips have been assisting instruction for many years and will continue as viable tools as we face the needs in the future. Projected visuals allow the teacher to design and create materials that meet their particular subject needs and individual preferences. In addition to nonprojected visuals, this chapter focuses on the characteristics and applications of several projected visual formats.

Assignment

For this assignment you will need to complete these activities in order:

1. **Objectives:** Read the chapter objectives in the learner's guidebook**.**
2. **Pretest:** Take the true/false quiz in the guidebook. The answers to the quiz questions are found at the end of the guidebook.
3. **Reading:** Read "Visuals" (p.140-169) in your text, *Instructional Media and Technologies for Learning.*
4. **Practice Quiz:** Return to the Learner's Test Book to take the multiple choice quiz and remember the answers to the quiz questions are found at the end of the guidebook.
5. **Chapter Test:** Be sure to be well prepared before you go to take chapter tests at your examination center. Just remember that these are closed book tests and so they should be taken without benefit of (1) printed copies of the practice exams, (2) consultation with other students, or (3) any other aid.
6. **Integration Activity:** Complete one of the following Integration Activities: Once you have completed the activity, mail it to us. At the top of the first page, write down 'activity 6-1' or 'activity 6-2' depending on which you select to complete."

    1. Think about how you might create a presentation or printed transparencies. Then, create a short presentation or set (at least 5 slides) of transparencies, keeping in mind the design principles discussed on page 167 of your book. Indicate the

2. purpose and possible use for the transparencies, and include a copy of your presentation.
3. Using the ASSURE model, develop a lesson incorporating a filmstrip, slideshow, video, or other form of projected media. For an example, review the "Blueprint" on page 168 at the end of Chapter 6. In the lesson include at least three specific examples you will use to elicit learner participation during and/or after viewing a projected visual.

Submitting Your Activity

The test results will be graded and sent back to you weekly. At the top of the first page of your assignment write down the title "Assignment 6- Visuals". Underneath that include your name, address, and the date. Beneath the heading, write down the instructions for the activity. Below the instructions write your response to the activity. When you are finished, mail it to us.

Assignment: Visuals
Points: 15

Grading Criteria:

Activity 6-1

- Appropriately sized fonts. (2)
- Font face is easily read. (2)
- Graphics are appropriate for content. (2)
- Clearly communicates message. (2)
- Colors are clearly contrasting. (2)
- Overall technical quality. (2)
- Indication of purpose & possible use. (3)
- URL does not function properly. (-3)

Activity 6-2

- Title of lesson stated. (1)
- (A) Clear description of learners. (2)
- (S) Objectives clearly stated. (2)
- (S) Methods, media, materials stated. (2)
- (U) Description of how materials will be used w/in the lesson and how the learners will be prepared. (2)
- (R) Describe how learners will participate. (2)
- (E) How will the quality of the lesson be evaluated? (2)
- Grader's discretion. (2)

Curriculum Vitae
(abridged)

Ross A. Perkins
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Education

Doctor of Philosophy	Instructional technology Virginia Polytechnic Institute and State University
Master's of Arts, Education	Instructional technology Virginia Polytechnic Institute and State University
Bachelor of Arts	English & Secondary Education Liberty University
Associate of Arts	Humanities Manatee Community College

Professional Experience

Project Manager	PT3 Grant, Virginia Tech
Assistant Project Manager	PT3 Grant, Virginia Tech (part-time)
Instructional Designer	ITMA on-line degree program, Virginia Tech (part-time)
Instructional Designer	Interactive Development & Design (paid summer internship)
Program Support Tech., Sr.	Physics Department, Virginia Tech
Director of Public Relations	Hargrave Military Academy
English Instructor	Hargrave Military Academy

Other Experience

Technology trainer	Pittsylvania County, Va.
Web designer	Self-employed
Communications specialist	Army National Guard Honorable discharge

Publications & Presentations

Perkins, R. A. (2000). Is leasing your best option? *VSTE Journal, 14*(2), 5,12-15.

Perkins, R. A. (2002). One for all: The single computer and technology integration. *VSTE Journal, 16*(2), 14-20.

Perkins, R. A. (2003a). *The role of context in instructional design: A case study examining the re-purposing of web-based master's degree courses for use in Malawi.* Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Perkins, R. A. (2003b). *The role of context in the adaptation of a U.S. designed web-based learning program for Malawi.* Paper presented at the Association for Educational Communications and Technology Annual Conference, Anaheim, CA.

Perkins, R. A., & Cobb Jr., R. (2001). Issues related to creating web-based high school courses. *VSTE Journal, 16*(1), 30-36.

Perkins, R. A., & Smith, K. (2002). *One for all: The single computer in your classroom.* Paper presented at the Virginia Society for Technology in Education Annual Conference, Roanoke, VA.

Perkins, R. A., Snider, R., Lockee, B. B., & Holmes, G. A. (2001). *Strategies for scaling up distance education programs.* Paper presented at the Association for Educational Communications and Technology National Conference, Atlanta, GA.

Snider, R., Perkins, R. A., Holmes, G. A., & Lockee, B. B. (2003). A systematic approach to determining the scalability of a distance education program. In M. A. Fitzgerald, M. Orey & R. M. Branch (Eds.), *Educational Media & Technology Yearbook 2003* (Vol. 28, pp. 115-121). Westport, CT: Libraries Unlimited.

Snider, R., Perkins, R. A., Lockee, B. B., & Holmes, G. A. (2001). *A systematic approach to determining scalability options for a distance education program.* Paper presented at the EDUCAUSE 2001 Conference, Indianapolis, IN.

Sykes, R. P., & Perkins, R. A. (1998). So, you've got $1 Million to spend on technology. What's the plan? *Independent Schools, 57,* 78-81.

Whitt, G. L., & Perkins, R. A. (2002). *Essentials for change: Holistic support strategies.* Paper presented at the 8th Annual VDOE Educational Technology Leadership Conference, Roanoke, VA.

Zozie, P. A., Sanga, M. W., Gwayi, S. M., Nyirongo, N. K., Kanyengambala, J. C., Perkins, R. A., et al. (in press). Establishment of distance education for secondary school teachers in Malawi, Africa: A national needs assessment. In M. A. Fitzgerald, M. Orey & R. M. Branch (Eds.), *Educational Media & Technology Yearbook 2004* (Vol. 29). Westport, CT: Libraries Unlimited.

Zozie, P. A., Sanga, M. W., Gwayi, S. M., Nyirongo, N. K., & Perkins, R. A. (2003). *A national needs assessment project for Malawi.* Paper presented at the Association for Educational Communications and Technology Annual Conference, Anaheim, CA.

Editorships and Review Committees

Coordinator of electronic publications	VSTE publications
Managing editor	*VSTE Journal*
Section Editor (volunteer)	*VSTE Journal*
Editor & designer	*Quanta* newsletter
Editor & designer	*Guidon* alumni magazine
Reviewer	Nat'l. Educational Computing Conference

Speaking Invitations

Faculty Development Session. Chatham Hall.
Chatham, Va.

Professional Development Day. West Virginia Chapter of National Society for Fund Raising Executives.
Charleston, W. Va.

Luncheon meeting. Central Virginia Chapter of National Society for Fund Raising Executives.
Lynchburg, Va.

Professional Memberships

- Association for Educational Communications and Technology
- International Society for Technology in Education
- Virginia Society for Technology in Education

Selected Awards and Honors

- Faculty Campaign Scholarship Winner, Virginia Tech
- *Captain's Award, Chatham Rescue Squad*
- Soldier of the Year, VaARNG, HHC 2/116, 1st Battalion, 29th L.I.D.
- Kappa Delta Pi inductee (Pi Sigma)
- Distinguished Honor Graduate, Ft. Gordon Signal School