

INTERACTIVE MULTIMEDIA USE FOR TRAINING  
IN SELECTED OKLAHOMA CITY BUSINESSES:  
A SURVEY AND CASE STUDIES

By

BEDE OLEWUIKE MARTINS ANYANWU

Bachelor of Arts  
University of Central Oklahoma  
Edmond, Oklahoma

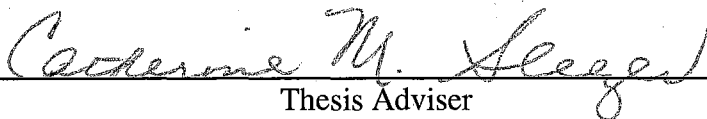
Master of Arts  
University of Central Oklahoma  
Edmond, Oklahoma  
1991

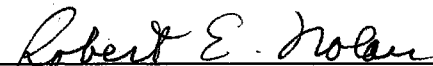
Submitted to the Faculty of the Graduate College  
of the Oklahoma State University  
in partial fulfillment of the requirements  
for the Degree of  
DOCTOR OF EDUCATION  
December, 1996

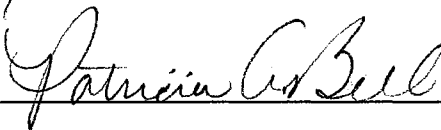
Thesis  
1996D  
A637i

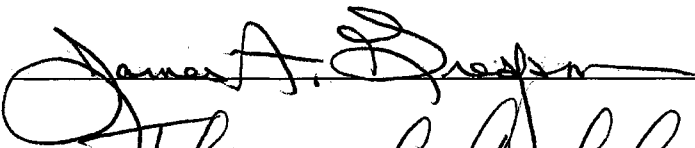

INTERACTIVE MULTIMEDIA USE FOR TRAINING  
IN SELECTED OKLAHOMA CITY BUSINESSES:  
A SURVEY AND CASE STUDIES

Thesis Approved:

  
Thesis Adviser





  
  
Dean of the Graduate College

## ACKNOWLEDGMENTS

I would first thank the almighty God for giving me the strength and courage in accomplishing this endeavor. Glory be to God in the Highest and Peace be to all who inhabit the earth.

Sincere thanks and appreciation goes to Dr. Catherine Sleezer, my dissertation advisor, who relentlessly and tirelessly worked with me in making this dream a reality. A special thanks to the members of my doctoral committee: Dr. Robert Nolan, committee chair, Dr. Patricia Bell, and Dr. James Gregson, who offered fruitful and insightful assistance in the course of this study.

I am highly indebted to my parents, my father, Mr. Francis Amanze Anyanwu, whose value for education helped to make this endeavor a reality, my sweet mother, Mrs. Francisca Anukem Anyanwu, who sheltered and provided our means of livelihood, especially when it was needed most (Biafra-Nigerian War, 1967-70). To my brothers and sister, Mazi Emma, Nze Okey, Dr. Fitzpatrick, Maria, Tony and Peter, for their moral and especially financial support. To my lovely children, Nene, Chike, and Ikenna, I extend my God loving gratitude.

Finally, I would like to especially recognize Dr. Catherine Sleezer, my thesis advisor, for her patience and guidance in working with me toward the materialization of this endeavor, and to Jim Sleezer, Wilda Reedy, and Irene Usuh Ogbeide for their wonderful assistance. To you, Dr. Catherine Sleezer, my parents, my brothers and sister, my children, those that lost their lives fighting for just cause, and all human-kind, I dedicate this research endeavor.

## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.....	1
Nature of the Problem.....	1
Background of the Study.....	1
Statement of the Problem.....	6
Purpose of the Study.....	6
Study Objectives.....	7
Significance of the Study.....	8
Assumptions.....	8
Limitations.....	9
Summary.....	9
Definition of Terms.....	10
II. REVIEW OF THE RELATED RESEARCH.....	14
Introduction.....	14
Business Context.....	14
Future Business Trends.....	14
Business Transformation.....	18
Training in a Business Context.....	21
Training Concepts.....	21
Training Bottlenecks.....	24
Technological Advancements.....	26
Interactive Multimedia Defined.....	26
Interactive Multimedia as a Training Tool.....	28
Justification of Use from a Business Perspective.....	29
Advantages to the Learner.....	33
Case Studies of IM Application Success Stories.....	34
Implementation Obstacles.....	39
III. METHODOLOGY.....	41
Introduction.....	41
Description of Population.....	41
Description of Research Methods.....	43

Chapter	Page
Survey.....	45
IV. DATA ANALYSIS AND FINDINGS.....	53
Introduction.....	53
Survey Data Collection.....	53
Response Rate.....	56
Data Analysis.....	58
Case Study Data Collection.....	91
Interview Procedure.....	92
Case Study Data Interpretation.....	92
Analysis and Findings.....	93
Summary.....	104
V. SUMMARY, DISCUSSION, AND IMPLICATIONS.....	105
Introduction.....	105
Summary.....	105
Discussion.....	110
Implications.....	112
REFERENCES.....	116
APPENDIXES.....	123
APPENDIX A - PROFIT-ORIENTED ORGANIZATIONS —1995 OKLAHOMA CITY CHAMBER OF COMMERCE MAJOR EMPLOYERS LIST (MEL).....	124
APPENDIX B - NON-PROFIT ORGANIZATIONS—1995 OKLAHOMA CITY CHAMBER OF COMMERCE MAJOR EMPLOYERS LIST (MEL).....	132
APPENDIX C - AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT (ASTD) PERFORMANCE SUPPORT.....	135
APPENDIX D - INTERACTIVE MEDIA SURVEY INSTRUMENT.....	140

Chapter	Page
APPENDIX E - FIRST COVER LETTER.....	144
APPENDIX F - FOLLOW-UP COVER LETTER.....	146
APPENDIX G - SECOND FOLLOW-UP COVER LETTER.....	148
APPENDIX H - NAMES OF EXPERT REVIEWERS.....	150
APPENDIX I - CASE STUDY INTERVIEW GUIDE.....	152
APPENDIX J - SAMPLE OF CONSENT INTERVIEW LETTERS....	155
APPENDIX K - INDIVIDUAL CASE STUDY INTERVIEWS.....	157
APPENDIX L - VERBATIM RESPONSES OF EVALUATION AND MEASUREMENT OF INTERACTIVE MEDIA EFFECTIVENESS.....	174
APPENDIX M - VERBATIM RESPONSES ON THE DIRECTION OF IM IN THE NEXT THREE TO FIVE YEARS.....	177
APPENDIX N - VERBATIM RESPONSES ON TRENDS COMING IN THE AREA OF INTERACTIVE MEDIA.....	181
APPENDIX O - INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL FORM.....	184

## LIST OF TABLES

Table	Page
1. Original and Adjusted Population Sample Sizes, Total Response Rate After Each Mailing, and Usable Survey Number* by Frequency and Percent.....	57
2. Title of Survey Respondents.....	59
3. Number of Individuals Employed in Respondent Organizations.....	59
4. Comparison of Employee Size of the Adjusted Population Sample with Respondents.....	61
5. Number of Years in Business, Response Frequency, Percent and Adjusted Percent.....	62
6. Approximate Amount of Yearly Sales.....	63
7. Techniques of Interactive Media Use.....	64
8. Activity Level of IM Use by Survey Category.....	65
9. IM Activity Led by Training Department and Training Department Not Involved.....	65
10. Number of Organizations with Different IM Techniques in the Have/Are Being Used Category.....	66
11. Number of Organizations with Different IM Techniques in the Used as a Test or Pilot Category.....	67
12. Number of Organizations with Different IM Techniques in the Using in an On Going Basis Category.....	67
13. Level III Interactive Video Activity by Frequency and Percent.....	69
14. CD-ROM Activity by Frequency and Percent.....	69



Table	Page
15. Compact Disc Interactive Activity by Frequency and Percent.....	70
16. Digital Video Interactive Activity by Frequency and Percent.....	71
17. Expert Systems Activity by Frequency and Percent.....	72
18. Laser Disc ROM Activity by Frequency and Percent.....	73
19. Electronic Performance Support Systems (EPSS) Activity by Frequency and Percent.....	74
20. Distance Learning Activity by Frequency and Percent.....	74
21. Simulators Activity by Frequency and Percent.....	76
22. Virtual Reality Activity by Frequency and Percent.....	76
23. Other Category Activity by Frequency and Percent.....	77
24. Frequency of Grouped Responses on Survey Question Number 12: Effectiveness of Interactive Media.....	78
25. Grouped Responses on the Direction of IM in the Next Three to Five Years by Frequency.....	80
26. The Function of Training Departments as We Know it Today Will be Fading Out by 1997 and Gone by 2002.....	81
27. Responses to Use of Interactive Media Will Enable Classroom Delivered Training to Revitalize, Create Stronger Training Departments, and Elevate the Chief Training Officer's Status.....	82
28. IM is the Competitive Tool Bag for the 90's and Beyond Responses.....	83
29. Current Training Managers are Ill Equipped for IM.....	84
30. Responses on Obstacles to Interactive Media.....	85
31. Frequency of Grouped Responses on Trends Coming in the Area of Interactive Media.....	87
32. Type of Industry Representation.....	88

Table	Page
33. Respondents' Rating of the Importance of Training by Frequency and Percent.....	89
34. Responses on Organizations with a Chief Training Officer.....	90
35. Title Classification by Frequency and Percent .....	90
36. Responses on How Organizations are Using IM for Training.....	94
37. Training Availability with Interactive Multimedia.....	96
38. Responses on Interactive Multimedia Availability.....	97
39. Responses on Interactive Multimedia Accessibility.....	98
40. Responses on Why Organizations are Using Interactive Multimedia.....	99
41. Individual Responses to the Question "Is There any Other Information You Would Like to Share How Your Organization Is Using Interactive Media?".....	101

## CHAPTER I

### INTRODUCTION

#### Nature of the Problem

The ancient Greeks were obsessed with the Promethean dream of stealing fire from the gods. They also dreamed of soaring away from the Earth and beyond the planets. These ancient dreams remained unrealized for thousands of years; yet, in less than forty years, both have been achieved. The fires of atomic furnaces have been ignited, humans have moved into space, and their machines have traveled far beyond the planets (Sanders & Birkin, 1980).

According to Sanders and Birkin (1980), scientific breakthroughs such as these change the speed with which knowledge is used and expand the scope of scientific inquiry. A scientific breakthrough that is currently causing these impacts for training in organizations is interactive multimedia technology. This breakthrough according to Gayeski (1993a), Gery (1991), and Papert (1993) will revolutionize training and instructional delivery.

#### Background of the Study

A traditional assumption of formal training was that multiple learners moved through a body of course material in unison, usually guided by a single training expert.

Unfortunately, this approach lacks flexibility. The underlying assumption is not always realistic: a large group of learners who can start at the same point in the learning content, work at the same pace, and finish the training program with the same knowledge and skills. Similarly, traditional training techniques require the availability of competent trainers. In many organizations, and for many learners, when these conditions cannot be met, training needs remain unfulfilled (Woollard & Morrison, 1995).

With interactive multimedia, these training needs can be met, thereby increasing the flexibility of training and the speed with which training content can be put to use. Interactive multimedia can also increase the speed of knowledge use by decreasing the amount of time required by individuals to learn new material. Historically, trainers have used devices such as slide projectors, text-books, videocassette recorders (VCR), film projectors, and other media to present instruction. Each device provides specific benefits for presenting certain types of information (Copeland, 1992). With interactive multimedia technology, these benefits can be integrated; thereby, significantly reducing the amount of time that learners/trainees require for acquiring training content (Charp, 1995).

Even more important than the increased speed of knowledge use is the expanded scope of scientific inquiry. As Ambron and Hooper (1988) pointed out:

Multimedia, like Galileo's telescope, is a powerful tool; it will change the way we look at knowledge, and give us a new vision of reality. The change in our view of knowledge brought by multimedia will not take one hundred years as it did with Galileo's telescope. The changes are already happening. They started with the

acceptance of microcomputer and continue as we move toward video computers, interactive television, and electronic books (p. 3).

With interactive multimedia, knowledge can be easily and vividly conveyed through a rich mixture of media: beginning with text and graphics, and achieving full immediacy through sound, still images, animation and full motion video (Amthor, 1991; Gayeski, 1993a).

Interactive multimedia optimists such as Ambron and Hooper (1988), Amthor (1991), Dennis (1993), Gayeski (1993a) Gery (1991), Papert (1993), Pina and Savenye (1992), and Strong (1992) have expounded on how this new technology is causing organizations to change from the traditional ways of conducting business. Many believe that organizations that seize the opportunities inherent in the interactive multimedia revolution will capture important competitive advantages, while those organizations that lag behind will be forced to scramble breathlessly in a race to catch up or be forced out of business.

However, not everyone shares a positive view of interactive multimedia. For example, the Brush Report (D/J Brush Associates, 1993) claims that no new technology has caused as much confusion, misunderstanding, misinterpretation, hype, hyperbole, antagonism, distortion and downright fraud as multimedia.

Also, some authors have cited similarities between interactive multimedia and earlier technological advances. Bunderson (1978) predicted the emergence of a "Model T" in the state of computer-assisted instruction (CAI) in 1990. Atkinson (1978),

predicted that the cost of computer-assisted instruction (CAI) would be so cheap and its applications so broad that CAI would be viewed as a training and educational necessity. However, these forecasts have not materialized. To date, much of the CAI instruction is drill-and-practice and tutorial in nature.

Similarly, Chen, Barbee, Atwater, and Garton (1994) pointed out that computer-based training (CBT) in its infancy also was envisioned as an instructional innovation that would forever change learning and content delivery. CBT is now more than two decades old, but it has not yet reached maturity. Chen, et al. noted that some early proponents of the CBT vision promised more than they could deliver. The reality is that for the most part those promises have not materialized.

Equally, some interactive multimedia success stories currently contained in the literature or touted by the technology vendors are no more credible than the CAI and CBT visions. While systematic research is needed to document the actual use of interactive multimedia for training in organizations, little work has been carried out in this area.

Reviewing the projected and the actual use of interactive multimedia highlights the tension between the promise and the reality for technology use in business and industry training. The sales of interactive multimedia were projected to grow from \$1.9 billion to \$9 billion by 1996 (Wood, 1993).

However, a study conducted by Oz and White (1993) on interactive multimedia use among corporate organizations in America revealed that while multimedia is a rapidly growing field, training still has a small share of the market. Surveys by Filipczak (1992) and Training Magazine (1993, 1995) showed only small increases in the use of

multimedia technology in corporate training in America, with 17% reported use of interactive multimedia in 1992, 20% in 1993, and 27% in 1995.

Potential reasons for the slow adoption of this new training technology given its expected benefits were identified in the literature. The reasons included the following: (a) the high capital cost associated with acquiring the technology (Anderson, 1995; Oz & White, 1993; Wood, 1993), (b) the lack of budgetary and other needed resources (Russ-Eft, 1994), (c) the lack of hardware and software knowledge (Russ-Eft, 1994), (d) the lack of upper management and employee support (Russ-Eft, 1994), (e) the fundamental human aversion to change (Wood, 1993), (f) the cumbersome nature of updating the training for many users or many locations (Wood, 1993), (g) the inability to keep up with the rapidly developing technology (Russ-Eft, 1994), and (h) the need for multiple champions and visionaries to implement such a change (Wood, 1993).

Another barrier is that most organizations, trainers, and Human Resource Development (HRD) professionals do not understand how this technology might apply to their own work (Gayeski, 1993a). To make prudent decisions relative to adopting interactive multimedia, HRD practitioners, trainers, and other business executives need systematically gathered information about how other organizations are using interactive multimedia technology for training.

One study that addressed this need was conducted by the American Society for Training and Development (1993). The study surveyed HRD executives in selected Fortune 500 companies. However additional studies are needed on how organizations of all sizes are actually using interactive multimedia for training.

In summary, some scholars have advocated the use of interactive multimedia and have highlighted the benefits of this technology for learning and training. Others have posited reasons for the slow diffusion of this technology. Examining actual and projected interactive multimedia use for training in organizations revealed high projected use but only small actual use. Many barriers have been identified to implementing interactive multimedia. One major barrier is lack of credible knowledge about how this training technology is being used for training both within and across organizations.

#### Statement of the Problem

Interactive multimedia technology popularity seems matched only by its mystique. The technology is being touted as the latest and greatest training tool ever used in organizations (Gayeski, 1993a), but the adoption rate for the technology is low (Anderson, 1995; Filipczak, 1992; Oz & White, 1993; Wood, 1993). Further, many HRD professionals, trainers, and other business executives are interested but unsure about exactly how their training needs can be met with interactive multimedia technology (Amthor, 1992-93). To make sound decisions, these individuals need systematically gathered information about how interactive multimedia technology is actually being used for training within organizational contexts. However, the literature contains little systematically gathered and reported information on this topic.

#### Purpose of the Study

The purpose of this study was to gain an understanding of (a) how HRD professionals, trainers, and other business executives in profit-oriented organizations in



one geographic region (Oklahoma City) viewed interactive multimedia usage for training in their organizations, and (b) how and why specific profit-oriented organizations were actually using the technology for training.

Because interactive multimedia technology is touted as the latest and greatest training tool ever used in organizations—and is claimed by some experts to be causing organizations to change from the traditional ways of conducting business—it is imperative that systematically generated information on how and why this technology is used for training in organizations be gathered and reported. HRD professionals, trainers, and other business executives can use this information to make appropriate decisions for their organizations.

#### Study Objectives

The objectives of this study were two-fold: the first was to gain an understanding of how HRD professionals, trainers, and other business executives in profit-oriented organizations in the Oklahoma City area viewed interactive multimedia usage for training in their organizations; the second was to obtain in-depth descriptive information of how and why interactive multimedia was actually used for training within specific selected organizations. Meeting these objectives provided information about interactive multimedia use for training both across and within specific organizational contexts.

#### Significance of the Study

Interactive multimedia technology is purported to be transforming the way business works (Dennis, 1993; Gayeski, 1993a; Gery, 1991; and Papert, 1993). It is

helping companies get leaner, smarter, and closer to the customer (Boyett & Conn, 1992; Sherman, 1993). However, because interactive multimedia technology is new and in its infancy (Amthor, 1992-93), examples are necessary to define the medium, develop the vocabulary, and explore new dimensions of content, software, and hardware (Ambron & Hooper, 1988; Amthor, 1992-93).

According to Hoover (1984), just as language arises out of the experience of coming to grips with human needs, so also does theory arise from the circumstances that people actually face. The hardest task is to explain what is really going on in business contexts.

Schien (1988) expounded that better theory is built on concepts and models around realities of how things really work in organizations. Therefore, a study that systematically gathers information on how and why interactive multimedia is actually used in organizations can provide knowledge useful for developing theories and models that mirror reality.

### Assumptions

The first assumption for the study was that participants would be willing to share information about their organizations' multimedia use. The second assumption was that the promising individual and organizational confidentiality, explaining the purpose of the study, and promising to share the results would elicit accurate responses. The third assumption for the study was that the individuals who responded to the survey were knowledgeable about the multimedia use in their organization.

## Limitations

The limitations of the study were as follows: the results of the survey cannot be generalized beyond the study population (Oklahoma City profit-oriented organizations that were contained in the Major Employers List (MEL) (Oklahoma City Chamber of Commerce, 1995). The results of the case studies apply only to the organizations studied. In addition, not every profit-oriented organization in Oklahoma City is a member of Oklahoma City Chamber of Commerce, and or listed in the MEL. However, the results of both parts of the study can be used to develop and modify theories of interactive multimedia use for training in organizations.

## Summary

According to market projections, interactive multimedia use for training is expected to continue making its mark within corporate American organizations (Dennis, 1993; Gayeski, 1993a; Oz & White, 1993). This technology offers unique opportunities for learners to become active participants rather than passive observers in the instructional experience. Further, it provides increased opportunities for retention, especially when learners can become part of the learning program itself (Amthor, 1992-93).

With respect to interactive multimedia as the "new kid on the block," its potentials as a performance technology may be yet to come. Some have touted that it will have a continuing impact on the delivery of training and education, and even on the enjoyment of spare time in the 1990s and beyond (Dennis, 1994; Galbreath, 1992, Gayeski, 1993a;

Gery, 1991; Papert, 1993). The technology could replace parts of trainer's traditional roles (Woollard & Morrison, 1995). Others look at its entrance into the training arena with skepticism. This skepticism may be as Kuhn (1970), put it: what a man sees depends both upon what he looks at and upon what his previous visual-conceptual experience has taught him to see, and in absence of such training there can only be confusion.

### Definition of Terms

The following terms are defined as used in the study.

American Society for Training and Development (ASTD): This term refers to the largest professional association for training and development professionals.

Authoring System: Authoring systems are productivity enhancers or tools that write other programs. These software tools help trainers, developers, and subject matter experts create multimedia programs or presentations without requiring the painstaking skills involved in traditional programming (Adam, 1993).

Compact Disc-Interactive: CD-I is a closed-system box designed to connect to a home television or other monitor. It is similar to a VCR, but has the capacity of storing digital color images, text, graphics, audio, and compressed full motion video. It provides up to 144 minutes of CD-quality stereo, up to 9.5 hours of AM-radio-quality stereo or up to 19 hours of monophonic audio (Barbee and Ofiesh, 1990; Galbreath, 1992).

Compact Disc-Read-Only Memory: This device is a small 4.75 inch laser-encoded optical memory storage medium that has the same constant linear velocity spiral format as compact audio discs, and it is capable of playing digital data. It can hold 550

megabytes of data which is roughly equivalent to 500 floppy disks. It is used as huge-capacity disc drive in a computer, and can be installed either directly within a computer or as an external device (Gayeski, 1993a).

Compact Disc-Read-Only Memory Extended Architecture: (CD-ROM XA) This technology is an extension of the CD-ROM. It also supports digital audio and still images. CD-ROM XA adds digital audio and graphics to CD-ROM data (Wood, 1993).

Digital Video Interactive: (DV-I) This technology includes a compression and decompression system that displays digital graphics and full motion video with audio. It allows real-time presentation of up to 72 minutes of full-motion, full-screen digital video, audio, and graphics from CD-ROM (Barbee & Ofiesh, 1990; Galbreath, 1992).

Expert Systems: Expert systems are computer-based systems specifically designed to duplicate or improve upon human decisions in a specific area of knowledge (Allen & Carter, 1988).

Hardware: The electric, electronic and mechanical equipment used for processing data.

Human Resource Development (HRD): is an academic discipline and a professional practice. McLagan (1989) defined HRD as the integrated use of training and development, organization development, and career development to improve individual, group, and organizational effectiveness.

HyperCard: HyperCard is software with flexibility in information organization, and the ability to link related information stacks together through the use of a button located on the computer screen (Ragan, 1988).

Hypermedia: Hypermedia is a system that allows creation of text, data components, graphics, digital sound, and animation from within the development structure (Stevens, 1989).

Hypertext: Hypertext refers to non-sequential text on a computer screen, that allows the user to move freely among various "nodes." A node is a small collection of data, usually organized around a single topic (Seyer, 1989).

Interactive Multimedia: This term includes a wide variety of computer-based systems. Such systems can include interactive video, compact disc interactive, digital video interactive, simulators, CD-ROM drive, experts systems, etc. (Gronbeck, 1993; Piz and Jurras, 1995).

Interactive Videodisk (IVD): IVD is a system that interfaces with a computer to access frames, motion sequences, and audio. The user interface can be via touch screen, light pen, mouse, voice recognition, or all the above (Smith, 1987; Barbee & Ofiesh, 1990; Galbreath, 1992; Gayeski, 1993a).

Laserdisk-Read Only Memory (LD-ROM): This technology combines on a single 12-inch disc, the full-motion video and stereo sound of a laserdisk and the computer data of a CD-ROM. An LD-ROM disc holds over 270 megabytes of digital data on each side and 30 minutes of full motion analog video and 30 minutes of audio (Wood, 1993).

Major Employers List (MEL): This list of organizations that are chamber of commerce members with 100 or more employees was published by the Oklahoma Chamber of Commerce. For this study the MEL published in 1995 was used.

Simulators: A simulator is the physical interface between the learner and the underlying object system (Wager, Polkinghorne & Powley, 1992). Simulators have the ability to mimic real life events (Walter, 1993).

Software: A component that integrates the information technology and user interface of interactive multimedia system.

Training: Training is an experience, a discipline, or a regimen which causes people to acquire new, predetermined behaviors (Laird, 1985).

Virtual Reality: Virtual Reality is a computer-created sensory experience that so completely immerses the participant that he/she can barely distinguish this virtual experience from the real one (Adams, 1993). This immersion is accomplished through the use of such peripherals as data gloves and stereoscopic head mounted computer graphic displays.

## CHAPTER II

### REVIEW OF THE RELATED RESEARCH

#### Introduction

This study focused on the use of interactive multimedia for training in profit oriented organizations. The review of literature that supports this study is divided into three sections with the first section focusing on the business context, the second on training in a business context, and the third on technological advancements.

#### Business Context

This section explores future business trends. It also describes how businesses are transforming in response to the trends and the changes brought by the global economic frontier.

#### Future Business Trends

The global economic frontier brought with it revolutionary changes in the conduct of business, which according to experts will impact American businesses in the new Millennium (Citron, 1987; Boyett & Conn, 1992). Various forecasts and studies have been conducted on this trend. The Wall Street Journal and American Society for Training and Development studies are cases in point.



The Wall Street Journal (1993) conducted in-depth interviews with Fortune 500 companies on the question: "What will the process of work look like in the year 2000?" The study produced four major findings.

First, they found among those interviewed that the future is expected to be dominated by the use of technology. Workers are expected to use both desktop computers and small portable notebook computers that can go anywhere and have the ability to communicate back to their desktop units. Also, full video and sound were expected to be common, allowing workers to access company information through elaborate networks and also to access national and worldwide databases on a variety of topics.

Second, workstations were expected to go portable with organizational space rearranged as needs changed to accommodate employees on different work schedules. Private Cells and Hubs were predicted to be common as they would allow employees to plug into the company computers and exchange information.

Third, computer integrated manufacturing (CIM) and just-in-time (JIT) processes or approaches were expected to take on much more importance, and to be achieved by integrating computer technology from the factory floor with information from every other aspect of the business. This trend would require employees to acquire new training as companies moved from the traditional production approaches to the more integrated technological approach.

Fourth, the trend for fast delivery of quality products and services was expected to continue. Also, to remain competitive, organizations were projected to continue to improve the performance of their workers by focusing on information, communication,

and training. Equally, organizations were expected to use technology to deliver resources to their workers as quickly as possible, based on the workers' schedule and need.

Employees were expected to diagnose their training needs, schedule themselves into self-directed modules, and track their progress automatically.

The American Society for Training and Development (ASTD) (1993) National HRD Executive Survey that addressed business, technological and training trends was administered to selected executives in Fortune 500 companies. The survey revealed ten perspectives on business trends, three perspectives on technological trends, and ten perspectives on training trends. The findings are as follows:

On business trends, the first perspective was that the demand for global economy will become a major force impacting companies and the HRD profession. Second, an increase in the creation of high performance work organizations will necessitate work reorganization and redesign to improve performance. Third, employers will work harder to earn employees' loyalty. Fourth, the ways organizations use information networks to communicate will cross national and corporate boundaries. Fifth, important business processes will be reengineered, thereby, allowing businesses to keep up with the rate of change while continuing to pursue quality efforts. Sixth, the use of teams for key business processes will have significant impact in organizations. Seventh, to better manage the change, Human Resource Development (HRD) will be key in the transformation processes. Eighth, partnerships will prove vital to the global business milieu and dictate new rules for conducting business. Ninth, to improve themselves, employees will take responsibility for self-directed learning. Tenth, team leadership will impact the way organizations are designed.

On technological trends, the first perspective was that there will be an increase in the ease, use, and convenience of electronic devices in work processes. Second, HRD professionals will play a major role in the way information is created, stored, and shared. Third, the idea of "social computing" will be prominent, as organizations will extend their computing services to suppliers and customers.

On training trends, the first perspective was that businesses will experiment and centralize while searching for the right mix of direction and delivery of training. Second, more training will be delivered just-in-time. Third, training content will shift from isolated skill building and information transfer to performance improvement and support for high performance work organizations. Fourth, the continued influx of temporary and contract workers will challenge the HRD profession to identify ways to motivate, train, and communicate with this ad hoc workforce. Fifth, new learning models, self-directed learning, and team learning will gain popularity to meet the needs of the transformed training function. Sixth, partnership between small businesses, academia, and government will be key to the way small businesses receive and share training. Seventh, diversity in the work place will continue to grow. Eighth, training will be delivered through managers, team leaders, and technical workers. Ninth, technology will change how, when, and where people work and learn. Tenth, training and performance support will be influenced by the presence of digital technology and the information superhighway.

In summary, the surveys revealed expected changes in the United States business environment. These changes are predicated on the changes in the global economy and technology and are expected, in turn, to transform business.

## Business Transformation

The revolutionary change in the global economic frontier is transforming American businesses. Businesses are becoming leaner, meaner and closer to the customer (Boyett & Conn, 1992; Sherman, 1993).

Changes in most organizations have become dramatic, rapid and multifaceted (Sleezer, 1993). Everything seems to be changing: from the market to customer demands; from quantum leaps in technological changes (Rummler & Brache, 1995) to product and process improvements (Boynton, Victor, & Pine, 1993). Additional changes include a reduction in the life cycle of products and programs (Branson & Zimpfer, 1994), work process redesign, automation, workforce reduction, flexible time, strong customer orientation, and improvement in the knowledge and skills of employees (Boyett & Conn, 1992; Dennis, 1994).

Figuring out how to succeed in this rapidly-changing business environment is a question weighing heavily on many managers' minds. Boynton, Victor, and Pine (1993) pointed out that in the midst of these seemingly overwhelming changes, managers in various organizations are being asked to make critical competitive decisions that will affect their organizations' future success. Khalil (1993) also noted that managers' responses to technological changes and technological management will determine their organizations' success in this global economy.

However, much to their dismay, many managers are finding that the old rules do not apply anymore (Rummler & Brache, 1995). To meet tomorrow's challenges, managers are adjusting their business practices, changing their mental models (Senge,

1990), and are keeping abreast of new developments in performance and related technologies (Tapscott & Caston, 1993; Piskurich, 1993).

The old saying "Better late than never" (Livy, 10 B.C. cited in Stevenson, 1961, p. 1348) has changed to "Better never than late." Organizations that will survive this economic warfare are expected to be those that adopt to new technological innovations early (Dennis, 1994). Dennis pointed out that early adoption of a new technology can reduce the risks and costs associated with its implementation and maximize the benefits by building early expertise; thereby, enabling the organizations to strategically position themselves to utilize the new technology in the growth phase.

Though, Dennis (1993) adduced that adopting new ways of doing business, especially new technology, comes with a high price. The price can include high purchase cost, technical problems that require time to solve, early obsolescence if the technology fails in the marketplace; high human resource and capital expense required to successfully implement the technology in training endeavors; the need to backtrack if the organization chooses the wrong technology; and possible damaged relationships with management, stockholders, and the organization's tarnished image.

A model that describes the adoption of an innovation across businesses was provided by Rogers (1962). The model describes a) innovators, b) early adoptors, c) early majority, d) late majority, and e) laggards.

According to Rogers (1962) innovator organizations are first to try or adopt novel ideas of doing business. They are marked by their abilities to a) control substantial financial resources, b) understand and apply complex technical knowledge, and c) venture into the uncharted waters.

The early adoptors are organizations that are second to adopt new ideas for doing business. These organizations are considered the role model organizations for other businesses because of their discrete applications of innovations.

Early majority organizations are the third to adopt and they adopt new innovations before the average organizations. Their unique position between the very early and the late majority, makes them an important link in the adoption process.

Late majority organizations are the fourth to adopt new ideas. For organizations in this category, adopting new ways of doing business may be predicated on both economic necessity and other external/internal pressures. In these organizations, adopting new innovations is looked upon with skepticism and does not take place until other organizations have adopted.

The last group in the adoption ladder consists of organizations categorized as laggards. These organizations are the last to adopt new ways of doing business. As their point of reference is the past, decisions are often made in terms of what has been done in the past. The organization may adopt a technology that has already been superseded in the marketplace by another and more recent innovation. Because organizations in this group are skeptical of new ways of doing business, their adoption lags behind knowledge of the idea.

In summary, adopting new performance and related technologies in the early stages of the technology lifecycle is one way for organizations to compete in the global economy. In making adoption decisions, organization decision makers should gather information about the innovations from vendors, trade journals, conferences, experts, researchers, users in other organizations, and other sources. This practice limits the risks

of obsolescence due to non-support by vendors and courseware producers, and the loss of benefits that could have been obtained had the technology been used earlier (Braden, DeWeaver & Gillespie, 1991).

### Training in a Business Context

Employee training has emerged as a major workplace endeavor. Organizations are demanding that employees at all levels improve performance in their present jobs, acquire skills and knowledge to do novel jobs, and continue their career progress within a changing world of work (Craig, 1987). Business success in part depends on employee competence and productivity. Consequently, reducing training bottlenecks is important in today's organizations. This subsection focuses on training concepts and bottlenecks.

#### Training Concepts

The future of America in a globalized economy without a cold war will rest with people who can think and act with informed grace (Hughes, 1992). Such informed grace can be produced by training which plays a pivotal role in many changes that occur within an organization: from the purchase of new equipment, to the implementation of new policies, to the development of strategic/long-range plans, and to job performance improvements (Strong, 1992).

The definition of training has been debated among professionals for generations. As Laird (1985), put it, training is an experience, a discipline, or a regimen which causes people to acquire new, predetermined behaviors. Others have defined training in the following ways: the process through which people learn new skills or improve existing

skills (Spitzer, 1991); an organized procedure by which people learn new knowledge and or skills for a definite purpose (Beach, 1985);

Training has also been defined as a learning experience that seeks a relative permanent change in an employee that will improve his/her ability to perform on the job (DeConzo & Robbins, 1988). DeConzo and Robbins pointed out that the change can involve skills, knowledge, attitudes, or social behavior; it may mean changing what employees know, how they work, their attitudes toward work, or their interactions with their co-workers or supervisors. Similarly, McArdle (1989) defined training as any organized activity designed to bring about change in an employee's on-the-job skills, knowledge, or attitudes to meet a specific need of the organization.

While the definitions of training vary in some dimensions among experts and professionals in various fields, there is a consensus among them. That commonality is the rationale for using training in organization contexts; which is to improve individual worker performance that subsequently improves organizational performance (Sleezer, 1990), and increases productivity.

Because today's fast-paced global economic change requires knowledgeable skilled workers, organizations that will truly excel in the future will be those (organizations) that discover how to tap their employees' commitment and capacity to learn (Senge, 1990). In the twenty-first century, the education and skills of the work force will be the dominant competitive armament (Thurow, 1993).

Similarly, the competitive advantage in the century ahead will be made by humans. Reich (1995) supported the premise that the ability of American organizations to compete in the global marketplace ultimately will depend on skilled workers. Also,



human capital theory assumes that training develops skills that make employees more productive in their jobs (Becker, 1964; Shultz, 1961).

However, many of the performance bottlenecks found within organizations today are caused by lack of worker knowledge and skills (Sleezer, 1993). Improving workers' knowledge and skills can have a direct impact on an organization's profitability.

Businesses that recognize their workers' intellectual capital as the most important assets and train their employees, are more apt to see higher productivity and healthier profit (Dennis, 1994; U.S. Labor Department, 1995). An increase in profit can be associated with increase in productivity (Swanson, 1982; Swanson & Gradous, 1988). Training can increase worker productivity, and ultimately, the organizations' profit margins (Fetterman, 1993).

Over the last thirty years, training has grown into a major business activity, and has become a significant strategy for enhancing employee performance. About 41 million working Americans received some kind of formal training in 1992 (Filipczak, 1992), 47 million in 1993 (Froiland, 1993; Training, 1993), and about 49.6 million in 1995 (Training, 1995).

Training has cost billions of dollars (Bushnell, 1990). In 1995, the estimated cost was about \$52.2 billion (Training, 1995). With billions of dollars spent each year on training, organizations are looking for cost-effective training strategies and greater accountability in the way these resources are allocated (Berardinelli, Burrow, & Jones, 1995).

## Training Bottlenecks

The link between training and productivity has been recognized (Fetterman, 1993). However, transfer of training within organizational contexts can be improved.

Traditional approaches to the transfer of knowledge include making information available to workers via policy manuals, word of mouth, one-on-one mentoring, unstructured on-the-job training, instructor-led, and classroom training. According to Gronbeck (1993), the bottlenecks inherent in these traditional approaches are multifaceted.

First, many employees cannot find time to attend class, particularly when sessions are offered infrequently or off-site. Second, the high expense of bringing experts on-site, and even greater cost of sending employees to external workshop sites prohibits offering some training. Third, employees often leave classes with few opportunities for follow-up besides a binder of materials which may or may not contain information that can help them and that often becomes quickly out of date. Fourth, classes must either be taught at a slow pace and low technical level or risk losing some attendees. Fifth, the number of experts in some fields are limited and only a small number of employees can benefit from their individualized instruction. Sixth, the media used in most classes--lectures, handouts, overhead slides, video tapes, and small group discussions are often inadequate for effectively teaching certain concepts.

In the same vein, Branson and Zimpfer (1994) posited that bottlenecks to traditional training include slow response of training to job needs; organizational disruptions when people are removed from their jobs; and trainees forgetting, which

occurs as a simple decay function of time. These concerns have prompted management in some organizations to demand that trained employees demonstrate knowledge and skill of specific job objectives (Nanry, 1988). Equally, trainees are asking for training materials geared to their job requirements, that are delivered on-time, and on-demand (Bushnell, 1990).

According to Strong (1992) and others, organizations are trying to avoid these training bottlenecks by looking for better, faster, more efficient training tools that promise performance objectives and flexibility, are readily available, and keep the learner in control. Some experts reasoned that performance objectives geared toward training should focus on teaching the performance of a skill, not the theoretical knowledge related to the skill. The theoretical knowledge needed to properly perform the job must be included, but the focus must be on the task, not on the theory.

Sleezer (1990), reasoned that training can be improved by selecting and training on the portions from the total content that the group or the individual needs. With this improvement, trainees avoid wasting time covering material they already know in order to get to what they really need to learn.

Another potential improvement involves timing. Training should be available to accommodate as many different schedules as there are different people or work shifts (Strong, 1992). For example, training could be available 24 hours a day, and as the trainee needs it. Access to the training program should be trouble free and "user friendly."

In summary, training is an endeavor that can increase workers' productivity and that, ultimately, can increase organizations' profit margins (Fetterman, 1993). Also,

training bottlenecks exist that challenge organizations to efficiently provide workers with the knowledge and skills required for the organization to stay in business and to compete more effectively in the global economic frontier. These bottlenecks can be eased with training that is flexible, readily available, and controlled by trainees.

### Technological Advancements

Every generation lives in a different world from its predecessors. Technological advancements made during a generation's lifetime benchmark changes, and frame and define the world in an outward and tangible way (Mills, 1985). More than any other agent of change, technology is transforming the way businesses work and is helping organizations get leaner, smarter, and closer to the customer (Boyett & Conn, 1992; Sherman, 1993). Interactive multimedia is one such technological advancement made in this generation. Compared to facsimile transmissions, this technology is a lot more high tech and a lot more high touch both in its content and its features (Naisbitt, 1994). The subsection examines interactive multimedia definitions, its use as a training tool, justification for use from a business perspective, advantages to the learner, case studies of success stories, and implementation obstacles.

#### Interactive Multimedia Defined

Interactive multimedia (IM) is a broad term that describes a wide variety of computer-based systems (Gronbeck, 1993). The term interactive multimedia has varied definitions. One way to define it is to examine each term separately.

The term "interactive" implies a system designed in such a way that it will respond to choices made by the individual user. The computer responses are not in a linear and predetermined form, but rather are influenced by spontaneous user actions, or by prompts from the system. The responses are archived through the use of such input devices as a keyboard, mouse, light pen, touch screen, voice, etc. (Dictionary of Computing, 1990; Gronbeck, 1993; Smith, 1987).

The term "multimedia" refers to the use of many types of information in a system (Gronbeck, 1993). The system combines hardware, software, and storage devices (Galbreath, 1992) on a single platform that enables the end-user to input, create, manipulate, and output text, graphics, audio, video and animation (Oz and White, 1993).

The definition of interactive multimedia also can encompass a wide variety of computer-based systems. Such systems include interactive video, compact disc interactive, digital video interactive, simulators, CD-ROM drive, electronic performance support systems, and experts systems, etc. (Gronbeck, 1993; Piz & Jurras, 1995).

To Pina and Savenye (1992), interactive multimedia includes computer text, full or still motion video, audio, graphics, and animation, which may be combined in a single interactive application. Gayeski (1993b) defines interactive multimedia as a computerized data base that allows users to access information in multiple forms, including text, graphics, video, audio, and is designed with link nodes of information that allows the user to access information according to needs and interest. Dubin (1996) defines interactive multimedia as the integrated use of video, photography, sound, text, animation and graphic images.

In another vein, Hofstetter (in press) described interactive multimedia as the use of computers to present and combine text, graphics, audio and video, with links and tools that let the user navigate, interact, create, and communicate. This definition contains four essential components: a) a computer to coordinate what the learner sees, hears, and interacts with; b) links that connect the information; c) navigational tools; d) ways for the learner to gather, process, and communicate his or her own information and ideas.

There is no definitive agreement among experts on the definition and components of interactive multimedia. However an area of common agreement is that interactive multimedia use improves business results, individual performance, learning and retention, improves systemic thinking; reduces costs, and learning time; increases flexibility, and engages learners (Dubin, 1996).

### Interactive Multimedia as a Training Tool

The field of HRD is exploding into the new and exciting arena of interactive multimedia training. More emphasis is placed on using all the avenues of technology to make training interventions more exciting, hands-on, visual, and interactive (Dubin, 1996). Interactive multimedia (IM) is a technology that can involve organizing and using tools of the mind and tools of learning to improve the conduct of training. With IM, knowledge can be organized to mirror the structure of human thinking through its ability to be reminded to branch from one thought to a related, yet wholly distinct experience. For example, the concept of hypermedia recreates this web by interlinking related information through instantaneous connections, or hyperpaths (Amthor, 1991; Gayeski, 1993a).

The ability of IM programs to provide knowledge on demand is made familiar by footnotes that can jump instantly to the cited source and back again. In addition to footnotes, IM programs can use "hot buttons" or highlighted icons that when selected, branch the user to further content (Amthor, 1991).

The use of interactive multimedia is rooted in constructivist, cognitivist, and behaviorist learning theories (Gilliespie & Dobrovolny, 1996). Because the process of training requires more than a passage through new territories, engaging the learner is crucial. Without true interaction, without a sense of self propulsion, training can be less effective. However, self propulsion is a core trait of interactive multimedia. This training technique taps into the learners' basic needs for self determination, making them active participants in life, explorers, and not idle passengers (Amthor, 1991).

Research in the late 80s and early 90s identified a number of benefits of interactive multimedia as a training tool. These benefits included increased motivation for the learner, mastery of subject matter, consistency of instruction, self-paced learner control, and reduced learning time, fear of failing, and organizational cost (Camillo, 1995).

#### Justification of Use from a Business Perspective

As America enters this last decade of the Industrial Millennium, businesses are facing challenges beyond the wildest dreams of the innovators who made it an age of miracles (Puterbaugh, Rosenberg & Sofman, 1989). Such miracles have made society more complex and demanding with information becoming more difficult to process and

assimilate. Interactive multimedia technology which can help ease the process of information assimilation is making its mark as a training tool in businesses.

The literature contains many reports of IM's successful use as a training tool. With IM, organizations have witnessed faster and more efficient manufacturing processes, (Flynn & Mandell, 1991), employee self-assessment and career explorations (Hall, 1988), quick and accurate receipt and dissemination of information, and employee training and education (Amthor, 1992-93; Kearsley, 1988). Also, organizations are saving tens of thousands of dollars a year in paper and printing costs (Greengard, 1993).

The use of interactive multimedia according to Wood (1993), has especially benefited business conduct in the following ways: (a) gain asset, (b) customization, (c) cost savings, (d) consistent, repetitive delivery and message, (e) predictable, (f) updateable, (g) increased productivity, and (h) interactivity. These benefits are discussed in the following paragraphs.

Gain asset refers to the fact that organizations that buy personal computers for the use of one or two particular training applications, can use the system for many other commercial off- the-shelf training packages at a fraction of the original investment. Thus, interactive multimedia training can convert operating costs into assets that can be reused for other enhanced training applications.

Customization refers to the fact that custom courseware can be the differentiator in gaining the right employee. Custom courseware can also provide extra expertise that the customer recognizes.

Cost savings refers to the fact that the use of interactive multimedia saves cost in the long run when compared to total training costs that include salaries, training time,



expertise, lost productivity, and travel time. The primary costs of interactive multimedia instruction lie in design and production, and not replication, distribution and delivery. With interactive multimedia, the cost is reduced as more trainees use the same program. With traditional instructional methods, the costs of instruction lie primarily in the delivery which remains constant or even increases as more trainees place greater demands on a fixed resource (Miller, 1993).

Consistent, repetitive delivery and message refers to the fact that it is difficult for classroom trainers to maintain the same enthusiasm and the same message impact day after day. But the use of interactive multimedia offers learners access to the same content and the same instructional design so that each trainee gets the same message. Although learners may arrive at the same message via different navigational routes, and different amounts of time—repetition leads to retention.

IM programs evaluate and reinforce all learners consistently. Excessive praise or blame awarded by various instructors in traditional classroom settings can lower a learner's self-concept and ability. However, an IM program keeps the interactions task-oriented and avoids this lowering of self concept by impartially validating the learner's accomplishments (Camillo, 1995).

Predictable refers to the fact that the training results can be forecasted as more trainees go through the training. A certain amount of training mastery will correspond to a level of performance on the job. Since training is consistent, a specific level of performance can be guaranteed on the job within certain statistical variation (Camillo, 1995).

Updateable refers to the fact that a custom training application needs to be modified as the skill, knowledge, and aptitudes it teaches change with the business needs. Interactive multimedia applications can be easily modified, especially when they are done in a modular format.

Increased productivity refers to the fact that IM can increase productivity by reducing the training time and also can require less time to administer. A number of studies by national corporations have found that training costs can be reduced and productivity can be increased because of reduced need for full time instructors, classroom facilities, and travel cost (Camillo, 1995). Camillo, further points out that job efficiency and effectiveness increases when employees can readily perform their assigned tasks better and faster with fewer errors and support calls. Also, there is high morale and less employee turnover.

Studies have found that IM training reduces training time. The most recent studies have found the time reduction in individualized instruction decreases the total training time from 30 to 50 percent (Camillo, 1995). In situations where trainees are learning to operate equipment that involves waiting time, computer simulation can compress the waiting time significantly (Phillips, 1991).

Travel to training locations and time away from work site can be reduced or eliminated. The cost can be significant as organizations spend about \$500 in lost time each day employees are away from their jobs in traditional classroom training (Camillo, 1995).

Interactivity refers to the fact that interactive multimedia has the ability to energize the training environment, thereby, stimulating both trainer and trainee (Amthor,

1991). The interactive format of the training application can keep the learner more involved and more inquisitive.

### Advantages to the Learner

Interactive multimedia technology as a training tool in organizations has benefits for individual learners. These benefits include: (a) increased motivation, (b) self-paced approach, (c) reduced fear of failure, and (d) increased mastery of subject.

IM feedback systems are inherently motivational according to some experts, because when learners receive patient individual responses, it enables them to use motivational attributes of curiosity, exploration, challenge, free choice, and self determination. Interactivity is an essential ingredient of successful learning. In a number of controlled experiments, researchers found that those who received training via interactive multimedia had a significantly better understanding of processes and theory than those who had a comparable lecture or workshop where the trainee was passive (Camillo, 1995).

Self-paced approach refers to learning processes that enable learners to progress at their own rate and to adjust the content to their own abilities. Self-paced learning hinges on three concepts: a) interaction, b) continuous testing and reinforcement, and c) trainee self-sufficiency. From the time the trainee turns on the system to the time the program is complete, each screen is presented as a result of trainee response (Phillips, 1991).

Reduced fear of failure refers to an individualized system where trainees are free to ask questions and explore areas that can cause an embarrassment in group situations. Studies indicate that when learners/trainees use IM training programs, their skill

attainment and content mastery is a result of their efforts rather than native speed or learning ability; fear of failure in front of peers is reduced, and they perceive real time learning as less threatening (Camillo, 1995).

Increased mastery of the subject means that interactive multimedia enables knowledge to be conveyed vividly through a rich mixture of media. For example, Adams (1993) noted that people retain about 10% of what they see, 20% of what they hear, 50% of what they see and hear, and 75% of what they see, hear, and do.

Mastery of concepts, procedures or facts requires that learners use memory, practice, and simulation (Adams, 1993). IM training allows for mastery by reinforcing knowledge and skills and by testing previously learned models of behavior through practice and simulation. Because instructional systems never lose patience, an IM program can encourage learners to persist in asking questions and in reviewing materials until real mastery is achieved; they can be programmed to halt movement to new material until current material is mastered; thus, ensuring that learners have strong foundations for continued learning (Adams, 1993).

#### Case Studies of IM Application Success Stories

Success stories have been reported by some organizations using IM technology for training. These successes include: reduction in training time, cost savings, training on demand, and increase in retention rate. The organizations described in this section include Bermac Communications, Inc., Bell South, Customer Power Company, United States Department of Defense, United States Army, Hewlett Packard, Bethlehem Steel, and Shell Petroleum.

Bermac Communications, Inc. Bermac Communications, Inc., an interactive multimedia design and production firm released the findings of a before-and-after client case study comparing classroom training to training using interactive multimedia. Bermac's client, a major international manufacturing company had been using classroom methods to train operators who had little or no formal education in how to work with complex manufacturing machinery. The classroom training proved ineffective primarily because it passed along the bad habits of well-meaning instructors. Poor performance could slow or halt the production line. Bermac produced an interactive multimedia training system for operators to practice their skills so that they could operate the machinery before going to the production floor. A year later, the client found that training time was reduced by 60%. Productivity was increased from 46% to 66%. Operator turnover had been nearly cut in half, dropping from 205% to 110% (Bermac Communications Inc., 1991).

BellSouth. BellSouth used interactive multimedia to train its customer representatives, account executives, and marketing representatives. The system was expected to save the organization about \$5 million and 20,000 training days over a five year period. Before the system was implemented, some courses required an employee to be in training five days. With IM the time was reduced to seven hours. The company reported that the calendar training period was reduced by 80% for marketing representatives, and retention level has increased by 40% (Connely, cited in Oz and White, 1993).

Consumer Power Company. Bell, cited in Oz and White (1993), reported that this organization converted its training to incorporate interactive multimedia. The move was

largely due to risk associated with its type of service. This organization previously conducted extensive training which included a twelve-hour traditional classroom training. The organization reported providing consistent, self-paced, and real work scenario training since it switched to interactive multimedia. The organization equally reported a reduction in the average training hours, and increased trainee retention.

United States Department of Defense (DoD). As a pioneer in seeking avenues for effective and efficient training, the DoD conducted a meta study of 47 studies that compared use of interactive instruction with conventional instruction in the military, industry and higher education. To evaluate the effects of interactive multimedia, groups that received the interactive multimedia instruction (treatment group) were compared with those who received the conventional instruction (control group).

The researchers measured knowledge (facts, concepts, and other information), performance (procedures, skills, and other capabilities), and retention. The findings indicate that a) interactive multimedia was generally more effective and less costly than traditional instruction, b) interactive multimedia could be used to effectively teach students in different training milieu, c) employees who underwent military or industrial training demonstrated an average increase in achievement from the 50th percentile, when using the traditional mode, to the 65th percentile when using interactive multimedia mode (Fletcher, cited in Oz & White, 1993).

In the higher education arena, the achievement was higher, from the 50th to the 75th percentile. Further, the more interactive, the higher the achievement levels, and interactive multimedia training resulted in approximately 31% time savings compared with traditional delivery method. Savings were obtained in the areas of instructional

personnel because fewer instructors were required (Fletcher, cited in Oz and White, 1993).

U.S. ARMY. The study conducted at the U.S. Army Air defense School compared classroom and interactive video delivery systems for the HAWK missile system maintenance course using control and experimental groups. The researcher concluded that the interactive video group (the experimental group) took half the time to solve repair problems. In addition, 100% of experimental group achieved mastery while only 30% of the groups using the conventional methods (the control group) achieved mastery (Smith, 1987).

Hewlett Packard. CD-ROM technology has been fully employed by Hewlett Packard (HP) as part of its multimedia technical training program for customers. The need resulted to requests from company's customers for alternatives to traditional classroom lectures (Spitz, 1992).

Spitz (1992) pointed out that the three reasons for the request were: a) some customers wanted to limit the time spent away from their jobs for training. Employees who work swing shifts, for instance, could not participate in training during regular business hours, b) some customers could not afford to send their employees to off-site training because of the high cost of tuition and travel expenses, and c) some customers' employees needed immediate training to fill a performance gap. Typically, their co-workers or managers stepped in and quickly trained them. Unfortunately, the results could be insufficiently trained people, under-used systems, and higher support costs.

To address these problems and meet the customers needs, Hewlett Packard used CD-ROM technology to create a low cost, multimedia, self-paced training program that

was conducted in the customer's workplace. The ultimate goal of HP's multimedia training was to improve human performance. And its immediate objective was to teach system operators and managers how to accomplish specific job-related tasks.

When the training program was finished, trainees feedback was: "They liked the immediacy of audio visual training, and also felt they were being taught by an expert standing over their shoulders" (Spitz, 1992).

Bethlehem Steel. Bethlehem Steel's initial thrust was to train blue collar workers in the plant on a variety of steel production techniques. A digital video interactive (DVI) base application was designed to teach employees how to analyze production, inventory, and sales statistics to control precisely the availability of different types of steel.

In evaluating the multimedia application at the steel company, the manager of the training team found interactive multimedia training to be extremely cost effective, though, it was tricky to quantify results. Of the 5,000 employees who took at least one course, training time was lessened by 20% to 40%, and retention rates rose between 20% to 40%. The key factors that seemed to influence the findings were that the trainees received training on demand, any time of the day, or stayed after work as they wanted to receive training (Murphy, 1992).

Shell Petroleum. Shell Petroleum had 21,000 employees and dealers from Maine to Honolulu. They needed to provide continuous training in new products, operations, safety, etc. This training had to be tuned to local conditions, to several generations and adaptations of equipment, and it had to be available at times convenient for employees who worked on a three-shift schedule that ran 24 hours a day, seven days a week (Zemke, 1991).



The real reason why the organization got involved with the new technology was its match to their unique situation—and, it paid off. According to Shell's plant training directors and specialists, interactive video was a big hit with trainees. Overall, they just love it. Employees especially liked the fact that it is a work at your own pace system and not classroom training.

The product training manager adduced that IVT indeed paid dividends for Shell. The cost of recently installed IVT based course on statistical process control were calculated. Conducted by conventional training, the course would have cost \$3 million. That figure included time off the job for trainees, salaries and expenses for trainers, development and delivery time, materials—everything. The same course delivered by IVT cost \$100,000. That is a 30-to-1 savings (Zemke, 1991).

### Implementation Obstacles

Some experts perceive that IM technology is going to revolutionize the way business is conducted especially in the arena of training (Dennis, 1994; Gery, 1991; Smith, 1987). But as enticing as the training opportunities may be with interactive multimedia systems, organizations have been slow in adopting this new training technology. The reasons included the following: (a) the high capital cost associated with acquiring the technology (Anderson, 1995; Oz & White, 1993; Wood, 1993), (b) the lack of budgetary and other needed resources (Russ-Eft, 1994), (c) the lack of hardware and software knowledge (Russ-Eft, 1994), (d) the lack of upper management and employee support (Russ-Eft, 1994), (e) the fundamental human aversion to change (Wood, 1993), (f) the cumbersome nature of updating the training for many users or many locations

(Wood, 1993), (g) the inability to keep up with the rapidly developing technology (Russ-Eft, 1994), and (h) the need for multiple champions and visionaries to implement such a change (Wood, 1993).

Another barrier is that most organizations, trainers, and Human Resource Development (HRD) professionals do not understand how this technology might apply to their own work (Gayeski, 1993a). Environmental factors can also restrict the introduction of interactive multimedia as a training alternative. One such environmental factor is the organizational climate. The introduction of interactive multimedia needs substantial dedication of training resources and also requires positive training commitment organizationally (Schwier, 1987).

In summary, interactive multimedia as a broad term is composed of hardware systems that vary widely based on the components they use. Some of the systems use additional components to enhance the capabilities or performance of the system. Further, there are different levels of system interactivity. Interactive multimedia seems to be a wave of the future for training in businesses. As a training tool, it can be justified from a business perspective in terms of reduced learning time, cost savings, and increased consistency of instruction. In addition, interactive multimedia has the following advantages for the learner: self paced learning process, reduced fear of failure, increased motivation, and increased subject mastery. Though enticing, interactive multimedia as a training tool has been associated with high start up costs.

## CHAPTER III

### METHODOLOGY

#### Introduction

The purpose of this study was to learn how profit-oriented organizations were actually using interactive multimedia for training. The research objectives were: (a) to gain an understanding of how HRD professionals, trainers, and other business executives in Oklahoma City profit-oriented organizations viewed interactive multimedia usage for training in their organizations, and (b) to obtain in-depth descriptive information of how and why interactive multimedia was used for training within specific selected organization contexts. This chapter delineates the research population and methods.

#### Description of Population

The target population for this study included profit-oriented organizations that a) were located in the Oklahoma City area, b) had one hundred (100) or more employees, and c) were contained in Major Employers List (MEL) (Oklahoma City Chamber of Commerce, 1995). The rationale for selecting profit-oriented organizations in the Oklahoma City area was that studies on interactive multimedia use for training have been conducted among Fortune 500 companies, while little or no research has been conducted among organizations in one geographical area.

The rationale for selecting organizations that employ one hundred (100) or more employees was predicated on the fact that today's global market is open to all comers. However, several authors have noted that current use of interactive multimedia technology to any significant extent is influenced by the number of employees who receive training (Kearsley, 1990; Oz & White, 1993, Wood, 1993). The non-use of the technology has been associated in part to high start-up costs (Kearsley, 1990; Oz & White, 1993; Russ-Eft, 1994; Wood, 1993). Based on economy of scale, the costs associated with interactive multimedia use for training per employee would be less in organizations with one hundred (100) or more employees.

The rationale for using MEL (Oklahoma City Chamber of Commerce, 1995) was that it listed organizations in the Oklahoma City area that each employed one hundred or more employees. The MEL contained three hundred and twenty eight (328) for-profit and non-profit oriented organizations. Of the three hundred and twenty eight (328) organizations, two hundred and seventy three (273) were for-profit organizations, while fifty five (55) were not for-profit organizations. The latter group included public schools; federal, state, city governmental agencies, and social organizations, such as Feed the Children.

Non-profit organizations were defined in this study as federal, state, city governmental agencies, schools, and other organizations that were classified as not for-profit. Because hospitals could be classified as for-profit or not for-profit, a phone call was placed to each hospital to determine its status.

Two hundred and seventy three (273) for profit organizations with 100 or more employees from the MEL list represented the target population for the study (Appendix A

identifies these organizations). Organizations included on the MEL list with 100 or more employees that were non-profit are identified in Appendix B. These non-profit organizations were not included in this study.

### Description of Research Methods

The first research objective was to gain an understanding of how HRD professionals, trainers, and other business executives in Oklahoma City profit-oriented organizations viewed interactive multimedia usage for training in their organizations. Answering the first research objective involved surveying Human Resource Development professionals, trainers, and other business executives in Oklahoma City for-profit organizations to gain an understanding of how they viewed interactive multimedia use for training in their respective organizations. The survey included: a) an examination of the specific types of media use, b) organizational and training departments' perceptions of interactive multimedia use, and c) changes caused by using the media.

Survey methodology was used to answer the first research objective because this methodology can be used to describe the distribution of characteristics within a population (Mason & Bramble, 1989), and to explain or explore a phenomenon (Babbie, 1973). Further, it can be used to obtain a snapshot of what organizations are actually doing at a moment in time (Harless, 1995; Leedy, 1993).

The second research objective was to obtain in-depth descriptive information of how and why interactive multimedia was used for training within organizational contexts. Answering this objective involved obtaining in-depth descriptive information of how and why interactive multimedia was used for training within specific organization contexts.

Case study methodology was used in answering the second research objective because it can be used to describe and characterize an occurrence or evolution of a phenomenon; and to give a detailed examination and account of a particular context or setting (Bogdan & Biklen, 1992). Also, the description and interpretation of the unit of analysis (individual organization) can result in abstraction and conceptualizations of the phenomenon that will guide subsequent studies (Merriam & Simpson, 1984). That is, in-depth case studies of IM use could reveal context specifics that would be difficult or impossible to gather using other methods.

Often, the best way to study a research topic is to combine methodological approaches that do not share the same methodological weaknesses (Singleton, Straits, Straits & McAllister, 1988). Therefore, this study employed methodological triangulation which is the use of two or more methods of data collection procedures within a single study (Leedy, 1993). Methodological triangulation according to Mitchell (1986), requires: a) clearly focused research objectives, b) selection of methods such that their strengths and weaknesses complement each other, and c) selection of the methods based on their relevance to the nature of the phenomenon being studied. In this study, the in-depth case study could reveal information not addressed by the survey. Similarly, the survey information could reveal patterns of information across organizations that would be difficult to obtain using case study methodology.

In summary, the two different research methods (survey and case study) yield different types of data. The data when combined, can provide a more comprehensive understanding of the phenomenon under study. The following subsection details how survey and case study methodologies were used in this study.

## Survey

Survey research method is best for helping to understand the characteristics of a particular group, referred to as the population (Ray & Ravizza, 1988). It can also be used to obtain a snapshot of what organizations are actually doing at a moment in time (Harless, 1995; Leedy, 1993). The following subsections describe the survey instrumentation, instrument validity and reliability, data collection, and data analysis.

Instrumentation. The survey instrument used for this study replicated items from the American Society for Training and Development (ASTD) (1993) National HRD Executive Survey on Performance Support and Interactive Media. ASTD, which is the largest professional training association in the world, used both literature analysis and input from expert HRD media technology practitioners in Fortune 500 companies to develop the survey instrument. Permission to use the survey was obtained from Ed Schroer, Vice President New Business and Research. The ASTD instrument is in Appendix C.

For this study, the ASTD survey instrument was modified to include information about the organizations' demographics and their use of compact disc interactive, digital video interactive, Laser Disc Read-Only Memory, and virtual reality technologies. The first three hardware types mentioned above were considered older hardware. These were included in the survey because the organizations that participated in this study may not have the financial resources to update to new technology quickly, especially where software and hardware lifecycles are two and three years respectively.

Other modifications to the ASTD instrument included excluding the term performance support as a topic and the replacing in question five the years 1995 and 2000 with 1997 and 2002 respectively. In addition, question number 14 and the last sentence were eliminated and the survey was renumbered. The survey instrument used in this study is contained in Appendix D, and the cover letters are in Appendices E, F, and G.

Instrument Validity and Reliability. Issues of instrument validity and reliability are vital in any research endeavor. To address these issues, this study adapted a modified ASTD National HRD Executive Survey Instrument that was developed using literature analysis and expert HRD media technology practitioners in Fortune 500 companies. However, the validity and reliability of the ASTD survey instrument had not been addressed.

Addressing the validity and reliability of the modified survey instrument used for this study involved pilot testing and expert review. The survey instrument was pilot tested in four organizations by individuals who had expertise in the areas of technology and training. The organizations were located in Oklahoma City or its suburbs but could not participate in the study because of (a) non-profit status or (b) not listed in MEL. In two organizations, the organization's contact person indicated that the technology expert was located in another geographical area, the survey was mailed to the person, and feedback was obtained via mail in a self-addressed, stamped envelop. (The names of the individuals and organizations that participated in the pilot testing are contained in Appendix H).



The instrument's content and face validity was examined by the professionals who had pilot tested it. Additionally, the survey instrument was also examined for face and content validity by four individuals who were knowledgeable in the use of interactive multimedia for training. These individuals were identified at the conference for the International Society for Performance Improvement where they presented on a topic related to technology. The fourth individual was referred by a conference participant as a technology expert. Appendix H contains the list of names.

Feedback from all the experts who reviewed the survey instrument for face and content validity were positive. The implications of the positive feedback were that the experts determined that the instrument appeared to cover the relevant content of IM use in business and industry. Some of the recommendations were to exclude Compact-Disc Interactive and Laser-Disc ROM because of their obsolescence. However, the researcher chose to include these technology because the responses from pilot test showed that some organizations were still using the technology.

Data Collection. The survey instrument titled "Interactive Media" and the cover letter were mailed to all the two hundred and seventy three (273) for-profit organizations listed in MEL (Oklahoma City Chamber of Commerce, 1995). The cover letter informed respondents that a) the questionnaire would take a little time to complete, b) that confidentiality would be maintained, c) that a response would be appreciated even if the organization did not use interactive media, d) that the survey was coded for follow-up, e) that some organizations would be selected to participate in a follow-up study, f) that the respondents could check the appropriate box if they are willing to participate in a

follow-up study, and g) that respondents were to provide name and address if they would like a copy of the study results.

The initial mailing of the survey occurred on May 13, 1996. The cover letter requested respondents to complete the survey within one week of the date received and to return the survey by May 20, 1996, in the enclosed postage-paid self-addressed envelope.

Phone calls were placed one week after the deadline to non-respondent organizations, followed by a follow-up letter with the survey instrument, and postage-paid self-addressed envelope. The follow-up was mailed on May 27, 1996. The modified cover letter requested respondents to complete the survey within five days of the date received, and to return the survey by June 1, 1996, in the enclosed postage-paid self-addressed envelope.

Again, phone calls were placed one week after the deadline to non-respondent organizations, followed by a second follow-up letter with the survey instrument, and postage-paid self-addressed envelope. The second follow-up was mailed on June 17, 1996. The modified cover letter requested respondents to complete the survey within twelve days of the date received and to return the survey by June 29, 1996, in the enclosed postage-paid self-addressed envelope.

Data Analysis. Some of the data obtained from the organizations were analyzed using statistics common for quantitative descriptive research as described by Mason and Bramble (1989). To meet the first stated research objective, some of the data items were analyzed using a statistical computer program that provided frequency distribution,

percentage of responses, and mean distribution (DeVellis, 1991). Other items, especially qualitative responses were analyzed descriptively by recording responses verbatim.

Case Study Case study involves in-depth consideration of an entity with intense investigations of the factors that contributed to the characteristics of the case. Case study can be conducted to foster understanding of how current conditions or characteristics developed for practical reasons (Mason & Bramble, 1989).

This method is useful for investigating contemporary phenomenon in a real life context, especially where the boundaries between the phenomenon and context are not definitive (Yin, 1989). Also, it is useful for focusing on business activities from emic perspective, because it can provide the 'hows' and 'whys' of information within an organization context (Yin, 1989, 1993).

According to Yin (1989), cases should be purposively selected and should be selected for theoretical rather than statistical reasons. In a similar vein, Patton (1990), pointed out that a purposive selected case should be rich in information that enables the researcher to learn a great deal about issues of importance pertaining to the case.

Case study selection. The criteria used for purposively selecting organizations used for the case study were: a) survey returns that indicated media use, and b) organization's willingness to participate in the study. The protocols described by Yin (1989) were used to guide the case study methodology.

To Yin (1989), reliability is achieved through the use of formal case study protocols that especially help to ensure that the same procedures are followed in multiple cases. Yin explained that the protocols important to case study research are: a) the study's

questions or objectives, b) the proposition(s), c) the unit of analysis, d) the logic linking the data to the proposition(s), and e) the criteria for interpreting the findings. The following subsections describe the case study protocols that guided the case study part of this study.

Case study objectives. The case study objectives provided an important clue regarding the most relevant research strategy to be used. The objectives were to obtain in-depth descriptive information of how and why interactive multimedia was used for training within specific selected profit-oriented organizations in Oklahoma City.

Proposition(s). According to Yin (1989), proposition(s) directs attention to something that should be examined within the scope of the study. For this study, attention focused on technology use in organizations and relied on Rogers' (1962) posit. Rogers (1962) posited that a trait of innovator organizations is their ability to understand and apply complex technical knowledge. In this vein, the propositions were as follows: a) organizations using interactive multimedia for training knew how the technology was used to fulfill their training needs and b) were using the technology based on how the business was transforming in response to changing business contexts.

Unit of analysis. Unit of analysis was related to the research objective which was to obtain in-depth descriptive information of how and why interactive multimedia was used for training within specific selected profit-oriented organizations in Oklahoma City. The units of analyses were the individual organizations in which the interviews were conducted.

Organizations that indicated willingness to participate in the follow-up study were purposively identified, selected, and contacted. The use of more than one case (organization) was undertaken to increase external validity. The use of multiple contexts enhances generalizability since the key processes, constructs, and explanations can be tested in several different configurations (Miles & Huberman, 1994). Contact of organizations and confirmation of their voluntary participation in the case study was conducted via the telephone.

Linking data to the proposition(s). Yin (1989), pointed out that data could be linked to the proposition(s) in any number of ways. In this study, the data that was gathered from each unit of analysis (organization), was linked to specific items in the interview guide. In turn these items had been generated from the propositions which stated that organizations using interactive multimedia knew how the technology was used to fulfill their training needs and are using the technology based on how the business is transforming in response to changing business contexts.

The four (4) experts who determined the content and face validity of the survey instrument also reviewed the interview guide for face and content validity and ease of use. The experts gave positive feedback and recommended several changes which were implemented. The interview guide served to reduce the data as suggested by Miles and Huberman (1994), and provided an organized way to show how the information from the interviews was obtained. Interviews data were collected on an audio tape. The audio tape cassettes were systematically analyzed to obtain information that was linked to the propositions. The interview guide is contained in Appendix I.

The interviewees' responses to open-ended items was expected to reflect their unique perspectives and voices. The researcher coded the data by using tactics described by Huberman and Miles (1994) such as compare and contrast and noting patterns and themes.

Criteria for interpreting the findings. The interview guide was used to interpret the information obtained from the audio tape cassettes. All the information from the interview guide was interpreted and reported as follows: a) whether the item supported the proposition, b) whether the item challenged the proposition, and c) whether the item was not related to the proposition.

In summary, the survey findings provided a snap-shot in time. The results were limited to describing the target population, and were non-predictive. The case study findings described in-depth the 'hows' and 'whys' of interactive multimedia use within specific organizational contexts. The results were situation specific and non-predictive. The results supported, challenged, and or refuted the case study propositions.

## CHAPTER IV

### DATA ANALYSIS AND FINDINGS

#### Introduction

The purpose of this study was to gain an understanding of how HRD professionals, trainers, and other business executives viewed interactive multimedia use for training, and how and why this technology was actually being used for training. This chapter presents the data findings obtained from both parts of the study (survey and case studies) respectively.

#### Survey Data Collection

The survey instrument titled "Interactive Media" and a cover letter were mailed to each of the two hundred and seventy three (273) for-profit organizations listed in the Major Employers List (MEL, Oklahoma City Chamber of Commerce, 1995). The cover letter gave a synopsis of the purpose of the survey. The letter was typed on stationary from the School of Occupational and Adult Education (OAED), College of Education, Oklahoma State University. Each letter was personally addressed to the respondent whose name appeared in the MEL. Also, each cover letter was signed by the researcher as a doctoral student.

The initial cover letter contained the phone and fax numbers for the School of Occupational and Adult Education and for the researcher's advisor. Subsequent cover letters included the researcher's phone and fax number. Including the researcher's phone and fax number, which was a local rather than a long distance phone number, may have contributed to increased communication with the organizations (including requests for another survey instrument, faxes of their survey responses, calls about question(s) pertaining to the survey, and calls to inform the researcher of the inability to participate in the survey). However, some respondent organizations went the "extra mile" and sent their responses via the School of Occupational and Adult Education's address and fax number at their expense.

The initial mailing of the survey instrument occurred on May 13, 1996. The cover letter requested respondents to complete the survey within one week of the date received and to return the survey in the enclosed postage-paid, addressed envelope.

The researcher was concerned that the survey response rate from business entities might be lower than other types of surveys, such as surveys of educational institutions. This concern was exacerbated because of the 22% response rate received by ASTD (1993), in a similar study of Fortune 500 companies.

According to Babbie (1973) follow-up mailing of a survey provides additional stimuli for responding. He stated that "in practice, three mailings (an original and two follow-ups) seems the most efficient" (p. 164). Also, Babbie (1986) pointed out that a telephone reminder should be employed when the total return of a mail survey falls below 50%. In this study, phone calls were placed to all non-respondent organizations to boost the response rate. This endeavor was accomplished by recording and isolating respondent



organizations using the MEL.

Phone calls also helped to identify organizations that were no longer in business for one reason or another, organizations that had been sold or merged with another, or organizations that were moving out of town. Phone calls equally helped to identify the exact person the cover letter should be addressed to, especially where some of those listed in the MEL (1995) were either retiring, had been retired, or were no longer with the organization. It also helped to correct the mailing addresses for some organizations.

Thirty three (33) organizations that were contacted via the telephone pointed that they had not received the survey instrument and requested another one via mail or fax. Fifteen (15) organizations indicated that they do not respond to surveys, four (4) organizations stated that they had chosen to not participate at this time, and thirteen (13) organizations refused to participate.

A follow-up letter with the survey instrument was mailed to all non-respondent organizations two weeks after the initial mailing. The follow-up was mailed on May 27, 1996. This endeavor resulted in additional responses.

Again, phone calls were placed one week after the follow-up letter and survey instruments were sent to those organizations that had not yet responded. A second follow-up letter with the survey instrument was mailed to non-respondent organizations three weeks after the first follow-up survey. The second follow-up was mailed on June 17, 1996. This effort resulted in additional responses.

## Response Rate

In computing response rates, the accepted practice is to indicate the original sample size and subtract the number that could not be delivered due to bad addresses, unavailability of individuals, and the like to produce the response rate (Babbie, 1973). In this study, twenty two (22) organizations were no longer in business, were sold or merged with another, or were moving out of town. Additionally, for a variety of reasons some individuals were unavailable.

A response rate of 50% is adequate for analysis and reporting (Babbie, 1973; Ray & Ravizza, 1988). Ray and Ravizza pointed out that one disadvantage of a mail survey is that they may not always be returned and that the response rate is typically very low. Ray & Ravizza also indicated that while the acceptable response rate depends on the type of survey, a typical mail survey probably has a return rate of less than 50%.

The initial mailing yielded a total number of forty seven (47) responses, representing 18.7 percent. The follow-up yielded a total number of thirty nine (39) responses, representing 15.5 percent. The second follow-up yielded a total number of seventeen (17) responses, representing 6.7 percent. The response rate totaled one hundred and three (103), representing 41 percent of the organizations surveyed. The one hundred and three (103) included eighteen (18) surveys that were only partially completed. The eighty five (85) surveys that were usable represented 82.5 percent of the total responses and 33.8 percent total adjusted population sample size. The low response rate for the survey has implications for the study's generalizability and usefulness. Clearly, the results are less useful and generalizable to the population than if there had

been a higher return rate. Table 1 depicts the original population sample size, the adjusted population sample size, the response rate after each mailing, the total return rate, and the usable survey number. Preliminary visual examination of the data for the initial group of respondents and the second follow-up group suggest a possible non-response bias. However, the number in each group was not sufficient to draw a definitive conclusion.

TABLE 1  
ORIGINAL AND ADJUSTED POPULATION SAMPLE SIZES, TOTAL  
RESPONSE RATE AFTER EACH MAILING, AND USABLE  
SURVEY NUMBER\* BY FREQUENCY AND PERCENT

Original population sample size	Total Number	273
Adjusted population sample size	Total Number	251
Responses	Frequency	Percent
Original population initial mailing	47	18.7
Adjusted population follow-up	39	15.5
Second follow-up	17	6.7
Total return	103	41

\*Usable Number of 85 surveys amounted to 82.5% of total responses

Usable Number of 85 surveys amounted to 33.8% of adjusted population

## Data Analysis

All survey responses were analyzed statistically, except responses to items 12, 13, and 19. These items had open-ended responses that were reported descriptively by presenting both individual answers verbatim and grouped responses. Part I of the survey instrument focused on the organizations' demographic information. Items 'b', 'd', 'e', and 'f', were analyzed and reported accordingly.

Item 'b' requested the title of survey respondents. Table 2 depicts the results. Administrators, CEOs, Directors, Presidents, and Vice Presidents were grouped together. This group comprised the largest number that responded to the item. The number totaled 40, representing 47.1% of the respondents. The second group comprised of Human Resources and Training Managers had 22 respondents or 25%. A third group included General Managers, Managers and Plant Managers and had 16 respondents or 18.9%. The remaining group, categorized as Other, included two Administrative Assistants, a Graphic Production Coordinator, an Internal Auditor, a Senior Project Leader, a Programmer Analyst, and a Marketing Secretary and represented 7 or 8.2%.

Item 'd' focused on the number of individuals each respondent organization employed. Table 3 depicts the findings. Organizations within the category that employed between 100-300 employees had the highest response rate of 54 or 63.5%. This was followed by 301-500 category with 14 or 16.5%, organizations with 901 and above employees had 12 or 14.1%, those with 501-700 employees had a return of 2 or 2.4%, and finally organizations with 701-900 category had 1 or 1.2%. Two organizations did not indicate the number of individuals they employed.

TABLE 2  
TITLE OF SURVEY RESPONDENTS

Title	Frequency	Percent
Administrators/CEOs/ Directors/Presidents/Vice Presidents	40	47.1
Human Resources/Training Managers	22	25.9
General Managers/Managers Plant Managers	16	18.9
Other	7	8.2
Total	85	100.0

TABLE 3  
NUMBER OF INDIVIDUALS EMPLOYED IN RESPONDENT ORGANIZATIONS

Number of Individuals	Frequency	Percent
100-300	54	63.5
301-500	14	16.5
501-700	2	2.4
701-900	1	1.2
901+above	12	14.1
Non Response	2	2.4
Total	85	100.0

Table 4 shows how the study's respondents compare with the adjusted population on the characteristic of number of individuals employed. Comparing the respondent organizations with the adjusted population using the characteristic of number of employees suggests that the respondents were somewhat representative of the population

Item 'e' focused on the number of years each respondent organization had been in business. Table 5 depicts the findings. Among respondents, organizations that had been in business for 41 years or more had the highest response rate (39) representing an adjusted percent of 47.6%. Other categories and the adjusted percent include organizations with 11-20 years with 14.6%, 31-40 years with 14.6%, 21-30 years with 12.2%, 1-10 years with 11%, and three organizations did not indicate any response.

Item 'f' focused on the approximate amount of yearly sales by respondent organizations. This item seems to be sensitive because some organizations that responded to the survey highlighted the private nature of the amount of their yearly sales. Also, this item had the highest number of non-responses. However, among the organizations that opted to respond, 21 organizations, an adjusted percentage of 39.6%, had sales of \$81 million and above; followed by 15 organizations, an adjusted percent of 28.3%, with \$1-20 million sales; 10 organizations, an adjusted percent of 18.9% with \$21-20 million sales; 5 organizations, an adjusted percent of 9.4%, with \$41-60 million sales; and 2 organizations, an adjusted percent of 3.8%, with \$61-80 in sales. Table 6 shows the approximate yearly sales by category, the response frequency, percent with that response, and the adjusted percent.

TABLE 4

COMPARISON OF EMPLOYEE SIZE OF THE ADJUSTED POPULATION  
SAMPLE WITH RESPONDENTS

Number of employees	<u>Adjusted Population</u>		<u>Respondents</u>		<u>Adjusted</u>
	Frequency	Percent	Frequency	Percent	Percent
100-300	175	69.7	54	63.5	65.0
301-500	32	12.7	14	16.5	16.9
301-700	10	4.0	2	2.4	2.4
701-900	8	3.2	1	1.1	1.2
901+above	26	10.4	12	14.1	14.5
Non Response			2	2.4	
Total	251	100.0	85	100.0	100.0

TABLE 5  
NUMBER OF YEARS IN BUSINESS, RESPONSE FREQUENCY, PERCENT,  
AND ADJUSTED PERCENT

Years	Frequency	Percent	Adjusted Percent
1-10 years	9	10.6	11.0
11-20 years	12	14.1	14.6
21-30 years	10	11.8	12.2
31-40 years	12	14.1	14.6
41+above years	39	45.9	47.6
Non Response	3	3.5	
Total	85	100.0	100.0



TABLE 6  
APPROXIMATE AMOUNT OF YEARLY SALES

\$ Yearly Sales	Frequency	Percent	Adjusted Percent
1-20 million	15	17.6	28.3
21-40 million	10	11.8	18.9
41-60 million	5	5.9	9.4
61-80 million	2	2.4	3.8
81-above million	21	24.7	39.6
Non Response	32	37.6	
Total	85	100.0	100.0

Part II, questions numbered 1-11, pertained to the interactive media techniques used within organizations. The survey respondents were asked to select all categories that applied to their organization. Respondent organizations were given the latitude to provide multiple responses with regard to each technique used. Table 7 shows the techniques of interactive media use among respondent organizations. CD-ROM had the highest frequency of use with 68.2%. None of the other frequencies were higher than 20%. Table 8 shows for each category (have/are being used, used in an on-going basis, used as a pilot test) the number of organizations in the category, and the number of

TABLE 7  
TECHNIQUES OF INTERACTIVE MEDIA USE

Interactive Media	Frequency*	Percent
CD-ROM	58	68.2
CD Interactive	17	20.0
Distance Learning	15	17.6
Level III Interactive Video	11	12.9
Other	11	12.9
Laser Disc ROM	7	8.2
Electronic Support Performance Systems (EPSS)	7	8.2
Simulators	7	8.2
Expert Systems	6	7.0
Digital Video Interactive	3	3.5
Virtual Reality	3	3.5

\*Multiple Responses Permitted

TABLE 8  
ACTIVITY LEVEL OF IM USE BY SURVEY CATEGORY

Activity	Number of Organizations	Techniques
Have/are being used	42	85
Used in an on going basis	26	41
Used as a test or pilot	11	19

\*Multiple Responses Permitted

techniques, and the total activity level of IM use, frequency, and percent. The category with the highest frequency was have/are being used with 85%. Table 9 shows the frequency and percent of training department involvement with all the IM activities. The IM effort was led by the training department 26% of the time, but 28% of the time the training department was not involved.

TABLE 9  
IM ACTIVITY LED BY TRAINING DEPARTMENT AND  
TRAINING DEPARTMENT NOT INVOLVED

IM Activity	Frequency	Percent
Led by training department	22	25.9
Training department not involved	24	28.2

Tables 10 through 12 show the usage of different IM techniques by organization for 3 categories—being used, used as a test or pilot, and used in an ongoing basis. For example, in the category have/are being used 21 organizations have used one technique, followed by 9 organizations that used two techniques, 7 that used three techniques, 3 that used 4 techniques, 1 that used 5 techniques, and 1 that used 6 techniques. In the category used as a test or pilot category, 5 organizations used one technique, followed by 4 organizations with 2 techniques, and 2 organizations with 3 techniques. In the category used in an on going basis category, 14 organizations used one technique, followed by 9 with 2 techniques, and 3 with 3 techniques.

TABLE 10  
NUMBER OF ORGANIZATIONS WITH DIFFERENT IM TECHNIQUES  
IN THE HAVE/ARE BEING USED CATEGORY

Number of Different Techniques Used	Number of Organizations
One	21
Two	9
Three	7
Four	3
Five	1
Six	1

TABLE 11

NUMBER OF ORGANIZATIONS WITH DIFFERENT IM TECHNIQUES  
IN THE USED AS A TEST OR PILOT CATEGORY

Number of Different Techniques Used	Number of Organizations
One	5
Two	4
Three	2

TABLE 12

NUMBER OF ORGANIZATIONS WITH DIFFERENT IM TECHNIQUES  
IN THE USING IN AN ON GOING BASIS CATEGORY

Number of Different Techniques Used	Number of Organizations
One	14
Two	9
Three	3

Tables 13 through 23 report the activity level for each technique that was listed on the survey instrument. Table 13 provides the activity level for Level III Interactive Video. Among all respondent organizations, 6 or 7.1% indicated have/are being used and that represents the highest activity level. This was followed by 3.5% that said they have used it in an ongoing bases, with 3.5% that indicated it was led by training department, 2.4% said they have used as a test or pilot, and 1.2% said that training department was not involved.

Table 14 provides the activity level for CD-ROM. Among all respondent organizations, 32 or 37.6% marked the have/are being used category and that represents the highest activity level. This was followed by 23.5% that said they have used the technology in an ongoing basis. Further, 11.8% said that the training department was not involved , 7.1% indicated it was led by the training department, and 7.1% said they have used as a test or pilot.

Table 15 provides the activity level for Compact Disc Interactive. Among all respondent organizations, 11 or 12.9% indicated the category have/are being used and that represents the highest activity level. Others include 4.7% that said it was led by training department, 3.5% that said they have used the technology in an ongoing basis, 3.5% said they have used as a test or pilot, and 2.4% said that training department was not involved.

TABLE 13  
LEVEL III INTERACTIVE VIDEO ACTIVITY  
BY FREQUENCY AND PERCENT

Level III Interactive Video Activity	Frequency	Percent
Have/are being used	6	7.1
Used in an ongoing bases	3	3.5
Used as a test or pilot	2	2.4
Led by Training Department	3	3.5
Training Department not involved	1	1.2

TABLE 14  
CD-ROM ACTIVITY BY FREQUENCY AND PERCENT

CD-ROM Activity	Frequency	Percent
Have/are being used	32	37.6
Used in an ongoing basis	20	23.5
Used as a test or pilot	6	7.1
Led by Training Department	6	7.1
Training Department not involved	10	11.8

TABLE 15  
 COMPACT DISC INTERACTIVE ACTIVITY  
 BY FREQUENCY AND PERCENT

CD-Interactive Activity	Frequency	Percent
Have/are being used	11	12.9
Used in an ongoing basis	3	3.5
Used as a test or pilot	3	3.5
Led by Training Department	4	4.7
Training Department not involved	2	2.4

Table 16 shows the activity level for Digital Video Interactive. Among all respondent organizations, 2 or 2.4% indicated the category have/are being used and that represents the highest activity level. None of the organizations indicated the category have used in an ongoing basis, 1.2% indicated it was led by training department, 1.2% said they have used the technology as a test or pilot, and 1.2% said that training department was not involved.



TABLE 16  
DIGITAL VIDEO INTERACTIVE ACTIVITY  
BY FREQUENCY AND PERCENT

Digital Video Interactive Activity	Frequency	Percent
Have/are being used	2	2.4
Used in an ongoing basis	--	--
Used as a test or pilot	1	1.2
Led by Training Department	1	1.2
Training Department not involved	1	1.2

Table 17 reports the activity level for Expert Systems. Among all respondent organizations, 4.7% indicated the category have/are being used and that represents the highest activity level. This was followed by 2.4% who indicated the training departments were not involved, 1.2% who have used the technology as a test or pilot, 1.2% have used it in an ongoing basis, and 1.2% were led by training departments.

TABLE 17  
EXPERT SYSTEMS ACTIVITY BY FREQUENCY AND PERCENT

Expert Systems Activity	Frequency	Percent
Have/are being used	4	4.7
Used in an ongoing basis	1	1.2
Used as a test or pilot	1	1.2
Training Department not involved	2	2.4
Led by Training Department	1	1.2

Table 18 reports the activity level for Laser Disc-ROM. Among all respondent organizations, 5.9% indicated the category have/are being used and that was the highest activity level of this technology use. Additionally, 1.2% indicated they had used it as a test or pilot, 1.2% have used in an ongoing basis, and 1.2% training department was not involved. In this category, none of the respondents indicated that this activity was led by the training department.

TABLE 18  
LASER DISC ROM ACTIVITY BY FREQUENCY AND PERCENT

Laser Disc ROM Activity	Frequency	Percent
Have/are being used	5	5.9
Used in an ongoing basis	1	1.2
Used as a test or pilot	1	1.2
Led by Training Department	--	--
Training Department not involved	1	1.2

Table 19 reports the activity level for Electronic Performance Support Systems (EPSS). Among all respondent organizations, 4.7% checked the category have/are being used and that represented the highest activity level. Also, 3.5% indicated that the training department was not involved, 2.4% indicated they have used it in an ongoing basis, and 1.2% indicated they used the technology as a test or pilot. In this category, none of the respondents indicated that the activity was led by the training department.

Table 20 reports the activity level for Distance Learning. Among all respondent organizations, 10 or 11.8% checked the category have/are being used and this category represents the highest activity level. Other activities include, 7.1% was led by training department, 3.5% have used in an ongoing basis, 2.4% have used as a test or pilot, and 2.4% training department was not involved.

TABLE 19  
ELECTRONIC PERFORMANCE SUPPORT SYSTEMS (EPSS) ACTIVITY  
BY FREQUENCY AND PERCENT

Electronic Performance Support Systems (EPSS) Activity	Frequency	Percent
Have/are being used	4	4.7
Used in an ongoing basis	2	2.4
Used as a test or pilot	1	1.2
Led by Training Department	--	--
Training Department not involved	3	3.5

TABLE 20  
DISTANCE LEARNING ACTIVITY BY FREQUENCY AND PERCENT

Distance Learning Activity	Frequency	Percent
Have/are being used	10	11.8
Used in an ongoing basis	3	3.5
Used as a test or pilot	2	2.4
Led by Training Department	6	7.1
Training Department not involved	2	2.4

Table 21 reports the activity level for simulators. Among organizations that responded in this category, 3.5% checked the category have/are being used, 3.5% have used in an ongoing basis, 1.2% have used the technology as a test or pilot, 1.2% reported that the effort was led by training department, and 1.2% reported that the training department was not involved.

Table 22 reports the activity level for Virtual Reality. The number of respondent organizations that indicated the category have/are being used was 1.2%, 1.2% have used the technology as a test or pilot, 1.2% have used it in an ongoing basis, 1.2% reported that the training department was not involved, and none reported activities that were led by a training department.

Table 23 reports the activity level for Other category. Technology in the Other category included satellite and other mediums. Among all respondent organizations, 7 or 8.2% indicated the category have/are being used and this represented the highest activity level in this category. Also, 4.7% indicated the category have used in an ongoing basis, and 2.4% checked the category was led by training department. No activity was reported for the technology used as a test or pilot. Also there was no report of training department involvement in the Other category.

TABLE 21  
SIMULATORS ACTIVITY BY FREQUENCY AND PERCENT

Simulator Activity	Frequency	Percent
Have/are being used	3	3.5
Used in an ongoing basis	3	3.5
Used as a test or pilot	1	1.2
Led by Training Department	1	1.2
Training Department not involved	1	1.2

TABLE 22  
VIRTUAL REALITY ACTIVITY BY FREQUENCY AND PERCENT

Virtual Reality Activity	Frequency	Percent
Have/are being used	1	1.2
Used in an ongoing basis	1	1.2
Used as a test or pilot	1	1.2
Led by Training Department	--	--
Training Department not involved	1	1.2

TABLE 23  
OTHER CATEGORY ACTIVITY BY FREQUENCY AND PERCENT

Other Activity	Frequency	Percent
Have/are being used	7	8.2
Used in an ongoing basis	4	4.7
Used as a test or pilot	--	--
Training Department not involved	--	--
Led by Training Department	2	2.4

On question number 12, survey respondents were asked an open-ended question. They were asked to describe how their organizations measured and evaluated the effectiveness of interactive media. Thirty-five (35) organizations responded to this item. The responses were grouped for reporting. To synthesize the data for this question, the researcher examined the written responses to the survey item and identified general themes. The tactics used to interpret the data included those identified by Huberman and Miles (1994) such as noting patterns and themes and compare and contrast. If the study were replicated, a different researcher might identify different themes. Table 24 presents the grouped responses and their frequencies. The verbatim responses are found in Appendix L. Most respondents reported measuring and evaluating interactive media in various ways. Examples of responses included traditional evaluation measures such as

TABLE 24  
 FREQUENCY OF GROUPED RESPONSES ON SURVEY  
 QUESTION NUMBER 12: EFFECTIVENESS  
 OF INTERACTIVE MEDIA

Grouped Responses	Frequency*
1. Never used	45
2. Formal and informal feedback evaluations	9
3. Training evaluations	5
4. Improved employee skills	4
5. Surveys and research	3
6. Increase in sales and bottom line	3
7. Conferences, other organizations experience and magazines	3
8. Improvement in productivity	2

\*Multiple Responses Permitted

course evaluation completed by audience, measures of learning and assessing costs and benefits. Many respondents indicated that they did not evaluate. Also respondents indicated the use of industry conferences, weekly videos, small team reviews, and marketing. Respondents often did not describe how these evaluations were conducted. The responses seemed contextually based. The categories for grouped responses and frequencies were as follows: Non applicability had forty-five (45); formal and informal



feedback evaluations had nine (9); training evaluations had five (5); improved employee skills had four (4); surveys and research had three (3); increase in sales and bottom line had three (3); conferences, other organizations experience; magazines had three (3); and improvement in productivity had two (2).

Survey question number 13 was an open-ended question that asked the respondents to describe where their organizations were heading in interactive media in the next three to five years. To synthesize the data for this question, the researcher examined the written responses to the survey item and identified general themes. The tactics used to interpret the data included those identified by Huberman and Miles (1994) such as noting patterns and themes and compare and contrast. If the study were replicated, a different researcher might identify different themes. Fifty-three (53) individuals responded to this item. Employee training was the highest response. The individual responses were multifaceted and seemed contextually based. Table 25 presents the grouped responses and frequencies. Individual verbatim responses to the item are found in Appendix M.

Survey question numbers 14 through 17 were items that could be rated on Likert-type scale. The items were equally weighted and rated on a 1-5 point scale. While 3.0 was the mid-point, 4.0 was a clear point of "agreement," and 2.0 was a clear point of disagreement."

TABLE 25

GROUPED RESPONSES ON THE DIRECTION OF IM IN THE  
NEXT THREE TO FIVE YEARS BY FREQUENCY

Grouped Responses	Frequency
1. Employee training	21
2. Education	4
3. Use for pricing and purchasing	3
4. Intranet use	3
5. Communication	2
6. Networked/World Wide Web	2
7. Meetings and conferences	2
8. Data gathering	1
9. Training departments' initiative	1
10. Career paths	1

Question number 14 asked respondents to rate their level of agreement with the following statement: the function of training departments as we know it today will be fading out by 1997 and gone by 2002. Table 26 depicts the responses. Among respondents, 50% strongly disagreed or disagreed, 26.8% neither agreed nor disagreed, and 23.2% strongly agreed or agreed. The responses resulted in a mean of 2.47, which is below the "mid-point" of 3.0 and above the point of "disagreement" of 2.0.

TABLE 26

THE FUNCTION OF TRAINING DEPARTMENTS AS WE KNOW IT  
TODAY WILL BE FADING OUT BY 1997 AND GONE BY 2002

Responses	Frequency	Percent	Adjusted Percent
Strongly agree	3	3.5	3.7
Agree	16	18.8	19.5
Neither agree nor disagree	22	26.0	26.8
Disagree	24	28.2	29.3
Strongly disagree	17	20.0	20.7
Non Response	3	3.5	
Total	85	100.0	100.0

Variable	<u>n</u>	Mean	Standard Deviation
Question #14	82	2.47	1.21

Question number 15 asked respondents to rate their level of agreement with the following statement: the use of interactive media will enable classroom delivered training to revitalize, create stronger training departments, and elevate the chief training officer's status. Table 27 depicts the responses. Among respondents, 51.1% strongly agreed or agreed, 35.3% neither agreed nor disagreed and 13.7% strongly disagreed or

TABLE 27

RESPONSES TO USE OF INTERACTIVE MEDIA WILL ENABLE  
CLASSROOM DELIVERED TRAINING TO REVITALIZE,  
CREATE STRONGER TRAINING DEPARTMENTS, AND  
ELEVATE THE CHIEF TRAINING  
OFFICER'S STATUS

Response	Frequency	Percent	Adjusted Percent
Strongly agree	8	9.4	9.7
Agree	34	40.0	41.4
Neither agree nor disagree	29	34.1	35.3
Disagree	9	10.6	10.9
Strongly disagree	2	2.4	2.8
Non Response	3	3.5	
Total	85	100.0	100.0

Variable	<u>n</u>	Mean	Standard Deviation
Question #15	82	3.32	1.09

disagreed. The responses resulted in a mean of 3.32, which is above the "mid-point" of 3.0. More than half of the respondents expected interactive multimedia to aid in revitalizing, creating stronger training departments, and elevating the chief training officer's status.

Survey question number 16 asked respondents to rate their level of agreement with the following statement: Interactive media is the competitive tool bag for effective trainers of the 90's and beyond. Table 28 depicts the responses. Among respondents, 65% strongly agreed or agreed, 31.3% neither agreed nor disagreed, and 3.7% disagreed. The responses resulted in a mean of 3.62, which is above the "mid-point" of 3.0.

TABLE 28

## IM IS THE COMPETITIVE TOOL BAG FOR THE 90'S AND BEYOND RESPONSES

Response	Frequency	Percent	Adjusted Percent
Strongly agree	8	9.4	9.6
Agree	46	54.1	55.4
Neither agree nor disagree	26	30.5	31.3
Disagree	3	3.5	3.7
Strongly disagree	--	--	
No Response	2	2.4	
Total	85	100.0	100.0

Variable	<u>n</u>	Mean	Standard Deviation
Question #16	83	3.62	0.88

Survey question number 17 asked respondents to rate their level of agreement with the following statement: Current training managers are ill equipped for interactive media. Table 29 depicts the responses. Among respondents, 65.8% strongly agreed or agreed, 26.9% neither agreed nor disagreed, and 7.3% disagreed and no respondents indicated strong disagreement. The responses yielded a mean of 3.65, which is above the "mid-point" of 3.0.

TABLE 29  
CURRENT TRAINING MANAGERS ARE ILL EQUIPPED FOR IM

Response	Frequency	Percent	Adjusted Percent
Strongly agree	17	20	20.7
Agree	37	43.5	45.1
Neither agree nor disagree	22	26	26.9
Disagree	6	7	7.3
Strongly disagree	--	--	--
No Response	3	3.5	
Total	85	100.0	100.0

Variable	<u>n</u>	Mean	Standard Deviation
Question #17	82	3.65	1.09

Survey question 18 asked about obstacles to interactive media use and provided respondents with the opportunity to report as many obstacles as possible. Some organizations gave multiple responses to this question. Table 30 presents responses. Among respondents, 48.2% cited that IM technology was not available in their organizations, 31.8% cited lack of training budget, 30.6% cited that the training department was not up to date on interactive media, 14.1% cited no obstacles were present, 11.8% cited other obstacles, 10.6% cited lack of management support, and 9.4% cited employee resistance.

TABLE 30  
RESPONSES ON OBSTACLES TO INTERACTIVE MEDIA

Obstacles	Frequency*	Percent
Interactive media technology not available in your organization	41	48.2
Lack of training budget	27	31.8
Training Department is not up to date on interactive media	26	30.6
No obstacles are present	12	14.1
Other	10	11.8
Lack of management support	9	10.6
Employee resistance	8	9.4

\* Multiple Responses Permitted

Survey question number 19 asked about the trends in IM. The data for this open-ended question was analyzed similarly to the other open-ended questions. Respondents saw the trends in the area of interactive media heading in multifaceted directions. Twenty-six (26) individuals responded to the question. Table 31 presents the responses. The individual responses that were recorded verbatim are reported in Appendix N. Two respondents indicated that they were not familiar enough to comment. The remainder of the responses indicated varied expectations. The largest number of respondents to this open-ended question saw IM as a source for training. Examples of individual responses included one-on-one training, self-directed training, and being able to develop short training programs and send them to the field workforce.

Survey respondents represented many types of industries. Question 20 requested respondents to furnish the type of industry their organization represented. Some respondents indicated that the organization represented more than one type of industry. The most represented industry was Manufacturing, with 36.5%. Other industries were Retail 14.1%, Financial Services 8.2%, Agricultural and Food Products 8.2%, Energy Products 5.9%, Communications 3.5%, Chemical and Allied Products 2.4%, Consumer Products 2.4%, and Diversified Services with 1.2%. The electronics industry was not selected by any respondents. The Other category represented 29.4% and included organizations in the health care and service industries. Table 32 shows the types of industries that were represented among survey respondents.



TABLE 31

FREQUENCY OF GROUPED RESPONSES ON TRENDS COMING IN THE  
AREA OF INTERACTIVE MEDIA

Grouped Responses	Frequency*
1. IM as a source of training	7
2. Big increase in the use of multimedia	5
3. Use of Internet for product ads and sales	4
4. Becoming more personal and user friendly	3
5. Toward World Wide Web Page Concepts	2
6. Lower cost	2
7. Faster communication	2
8. Not familiar enough to comment	2
9. Greater availability	2
10. Faster development of training programs	1

\*Multiple Responses Permitted

TABLE 32  
TYPE OF INDUSTRY REPRESENTATION

Type of Industry	Frequency*	Percent
Manufacturing	31	36.5
Retail	12	14.1
Agricultural and Food Products	7	8.2
Financial Services	7	8.2
Energy Products	5	5.9
Communications	3	3.5
Chemical and Allied products	2	2.4
Consumer Products	2	2.4
Diversified Services	1	1.2
Electronics	--	--
Other	25	29.4

\*Multiple Responses Permitted

Survey question number 21 asked respondents to answer the following question: How important is the role of training in your organization? This question was rated using a 1 to 5 point equally weighted scale. With 3.0 established as the mid-point, 4.0 was a clear point of "importance," and 2.0 was a clear point of "unimportant." Table 33 depicts

TABLE 33  
 RESPONDENTS' RATING OF THE IMPORTANCE OF TRAINING  
 BY FREQUENCY AND PERCENT

Total Response	Frequency	Percent
Very important	50	58.8
Important	19	22.4
Moderately important	11	12.9
Not very important	4	4.7
Not important at all	1	1.2
Total	85	100.0

Variable	<u>n</u>	Mean	Standard Deviation
Question # 21	85	4.32	0.95

the responses. Organizations responded thus: 81.2% very important or important, 12.9% moderately important, and 5.9% not very important or not important at all. The responses yielded a mean of 4.32, which is above the clear point of "importance" of 4.0.

Survey question 22 asked respondents whether they had a chief training officer in their respective organizations and requested that they furnish the title of the person. Tables 34 and 35 show the responses and distribution respectively. Responses were thus: 43.5% of the respondents affirmed that their organizations had a chief training officer,

TABLE 34  
 RESPONSES ON ORGANIZATIONS WITH  
 A CHIEF TRAINING OFFICER

Chief Training Officer	Frequency	Percent
Yes	37	43.5
No	48	56.5

TABLE 35  
 TITLE CLASSIFICATION BY FREQUENCY AND PERCENT

Title	Frequency	Percent
Training Manager	17	20.0
Human Resources/Personnel Manager	5	5.9
Training and Development Manager	5	5.9
Other	14	16.5

while 56.5% responded no to this item. The distribution of titles was thus: Training Manager, 20%; Human Resources/Personnel Manager, 5.9%; Training and Development Manager, 5.9%; and Other, 16.5%. In addition to findings from the survey data, this study also included findings from the case study. The case study findings are reported in the next section.

### Case Study Data Collection

The cover letter that accompanied the survey instrument requested respondents to check "yes" or "no" in a designated box if they would like to participate in a follow-up study. Fifteen (15) respondents checked the "yes" box that indicated willingness to participate in a follow-up study.

One criterion for selecting organizations to participate in a follow-up study was that the organization used interactive multimedia. The eight organizations that met the criterion of interactive media use were contacted by telephone. Seven responded positively and one failed to return phone calls. Each of the seven organizations served as a unit of analysis for this part of the study. A date and time for each interview was agreed upon by the respondents.

All the interviews were conducted within a span of four days. The first interview occurred on June 10, the second and third interviews occurred on June 11, the fourth, fifth, and sixth interviews occurred on June 12, and the seventh interview occurred on June 13, 1996.

The interviews were focused. According to Yin (1989), a focused interview involves a short period of time, e.g., one hour. The interviews for this study lasted an hour or a little more

than an hour. Yin also pointed out that such an interview may be open-ended, assume conversational orientation, and follow a set of guided questions derived from the case study propositions. For this study, the interviews were conducted using an interview guide with questions generated from the case study propositions.

### Interview Procedure

The interviews occurred at each respective business location. Each interviewee was given a letter that detailed the reason for the interview, length of time the interview would last, confidentiality of each organization unless otherwise consented, and permission to audio tape or videotape the interview to enable accurate reporting. A sample letter of consent can be found in Appendix J. All the interviewees consented to have their names used in the study and for the interviews to be audio taped.

### Case Study Data Interpretation

All the information contained on the audio tape cassettes were transcribed and analyzed using the interview guide. The tapes were then replayed later to recheck the data. Related comments were combined for reporting. The information obtained from the case study participants was linked to the following propositions: a) organizations using interactive multimedia know how the technology is used to fulfill their training needs and b) organizations are using the technology based on how the business is transforming in response to changing business contexts. Comments were analyzed based on: a) whether the item supported the proposition (SP), b) challenged the proposition (CP), and c) or the item was not related (NR) to the proposition.

## Analysis and Findings

Data was systematically linked to the propositions. The first four questions on the interview guide were linked to the first proposition, that organizations using interactive multimedia know how the technology is used to fulfill their training needs. Question Number 5 was linked to the second proposition and question number 6 asked participants if they had additional information to share.

The reader should note for all case study questions that the researcher was part of the data gathering instrument. Data coding required checking and rechecking on all items. However, different researchers could have identified or labeled the categories differently.

Question number one on the interview guide was as follows: How is your organization using interactive multimedia for training? The question was used to ascertain how participating organizations were using interactive multimedia for training. Sub-question a focused on performance improvement. The outcomes were thus: 5 organizations reported using it for formal training, 5 reported using it for on the job training, 2 reported using it for retraining, 6 for education, 1 for cross training, 1 for job orientation, 4 for modeling, 6 for drill/practice, 5 for testing, and 5 for information dissemination. All organizations reported that they used interactive multimedia for case studies and no organization reported using interactive multimedia for gaming. While these categories give a sense of actual IM usage, the reader should be cautious because of the small number of cases. This caution holds true for all the qualitative data in this study.

Sub-question b focused on performance support. The outcomes were thus: all organizations used interactive multimedia for performance support of existing jobs, 6 used it for job enrichment/refresher, 6 used it for tutorial, 6 used it for simulation, 4 used it for demonstration and 2 used it for additional jobs. No one reported using IM for embedded training. In terms of SP, CP and NR ratings, these responses were categorized as Yes for SP (supporting the proposition) because the respondents knew how the technology was being used. Table 36 shows the data.

TABLE 36  
RESPONSES ON HOW ORGANIZATIONS ARE USING IM FOR TRAINING

Category	Response	SP	CP	NR
<u>a. Performance Improvement</u>				
Formal training	5	Yes		
On the job training	5	Yes		
Retraining	2	Yes		
Education	6	Yes		
Cross training	1	Yes		
Job orientation	1	Yes		
Gaming	--	--	--	--
Modeling	4	Yes		
Drill/practice	6	Yes		
Case studies	7	Yes		



TABLE 36 (Continued)

Category	Response	SP	CP	NR
Testing	5	Yes		
Information dissemination	5	Yes		
Other	--	--	--	--
<u>b. Performance Support</u>				
Job enrichment/refresher	6	Yes		
Existing job	7	Yes		
Additional job	2	Yes		
Embedded training	--	--	--	--
Tutorial	6	Yes		
Demonstration	4	Yes		
Simulation	6	Yes		
Other	--	--	--	--

Question number two on the interview guide was: How is training available using interactive multimedia? Five respondents reported IM was available as a training assignment, 4 reported that it was available for sign-up or appointment, 3 reported that it was available on demand or walk-in, 3 reported it was available on employees' own time.

In the Other category, 1 organization reported weekly briefings in the Other category. This data is shown in Table 37. In terms of SP, CP and NR ratings, these

TABLE 37  
TRAINING AVAILABILITY WITH INTERACTIVE MULTIMEDIA

Availability	Response	SP	CP	NR
On-demand/walk-in	3	Yes		
Sign-up/appointment	4	Yes		
Training assignment	5	Yes		
Employee own time	3	Yes		
Other	1	Yes		

responses were categorized as Yes for SP (supporting the proposition) because the respondents knew how the technology was being used.

Question number three on the interview guide was: How is interactive multimedia available? Among the individuals interviewed, all indicated they had interactive multimedia on-site, 4 reported IM was available off-site, and 2 outsourced IM availability. In terms of SP, CP and NR ratings, these responses were categorized as Yes for SP (supporting the proposition) because the respondents knew how the technology was being used. This data is shown in Table 38.

Question number four on the interview guide was: How is interactive multimedia accessible? Organization responses were as follows: 6 organizations reported IM accessibility on a stand alone/portable workbench, 4 organizations reported accessibility

TABLE 38  
RESPONSES ON INTERACTIVE MULTIMEDIA AVAILABILITY

IM availability	Response	SP	CP	NR
On-site	7	Yes		
Off-site	4	Yes		
Outsource	2	Yes		
Other	--			

of EPSS (Job aid), information stations (kiosks) had 1%, and 3 reported Other. All the organizations reported accessibility of IM in a Networked system. Within this category, 3 used local area networks (LAN), 3 used wide area networks (WAN) and 6 used world wide web (WWW or internet). In terms of SP, CP and NR ratings, these responses were categorized as Yes for SP (supporting the proposition) because the respondents knew how the technology was being used. This data is shown in Table 39.

TABLE 39  
RESPONSES ON INTERACTIVE MULTIMEDIA ACCESSIBILITY

IM accessibility	Response	SP	CP	NR
Networked	7	Yes		
LAN	3			
WAN	3			
WWW/Internet	6			
Stand alone/portable workbench	6	Yes		
EPSS	4	Yes		
Job aid	4			
Information stations (kiosks)	1	Yes		
Other	3	Yes		

Question five on the interview guide was linked to the second proposition that organizations are using the technology based on how the business is transforming in response to changing business contexts, and was used to examine why the studied organizations were using interactive multimedia. The results are in Table 40.

The organizations studied reported various rationales for using interactive multimedia. Among the reasons for the use were reported thus: Competition (local and global) had 4, pro-active (ahead of competition) had 4, economical had 6, cost effective had 5, time savings had 6, business necessity had 5, employee driven had 1, customer driven had 5, technology driven had 5, and in vogue had 1. In terms of the SP, CP, and

TABLE 40  
 RESPONSES ON WHY ORGANIZATIONS ARE USING  
 INTERACTIVE MULTIMEDIA

Reasons for IM Use	Response	SP	CP	NR
Competition	4	Yes		
local	4			
global	1			
Pro-active (ahead of competition)	4	Yes		
Economical	6	Yes		
Cost effective	5	Yes		
Time savings	6	Yes		
Business necessity	5	Yes		
Employee driven	1	Yes		
Customer driven	5	Yes		
Technology driven	5	Yes		
In vogue	1	--	Yes	

Note: SP = Supports Proposition CP = Challenges Proposition NR = Not Related

NR ratings, all the responses except in vogue supported the second proposition.

The in vogue response challenged the proposition.

Question six on the interview guide was used to gather pertinent information that was not covered by other questions. Interviewees were asked if they would like to share

any other information regarding how the organization was using interactive multimedia. Although this question was not explicitly linked to the propositions, the information that was garnered shed more light with regard to interactive multimedia use within the organizations studied. Data gathered from follow-up questions was also included in this category. The individual responses on pertinent information are found in Table 41.

Following are some especially interesting insights culled from the individual responses: Customers want immediate gratification. They want information now, not two or three days later; our searchable databases are used by our distributors for training and information distribution; we plan on using the Internet more and more; I am excited about the technology. . . It was exciting to see the employees being excited about it; Interactive multimedia is going to be a very strong . . . .

Considered together these insights revealed that IM was used to meet business purposes specific to the organization and that these purposes varied across organizations. For example, in one organization customer need for information was the driving force, and in another organization, the interviewee seemed caught up in the excitement of seeing people engaged by the technology.

The responses also indicated that the interviewees understood some of the limitations of technology. For example, one respondent commented that "Internet's use is limited. It is too unorganized, too expensive, some of the information is erroneous, there is too much garbage, too much trash. There is a certain time of the day that the

TABLE 41

INDIVIDUAL RESPONSES TO THE QUESTION "IS THERE ANY  
OTHER INFORMATION YOU WOULD LIKE TO SHARE  
HOW YOUR ORGANIZATION IS USING  
INTERACTIVE MEDIA?"

Respondent	Individual Responses
<u>Respondent A:</u>	<ul style="list-style-type: none"> <li>• Interactive multimedia is going to be a very strong supportive medium. You need to have that as well as live instruction. What we are finding as well as why we are doing this is that the universities are not training the subjects that we need to operate a viable employee to our advantage.</li> <li>• I'm not finding students coming out of the universities trained in the relational databases. Unless they have changed in the last 3-6 months. But when we have been looking at them, we have not found that capability. Unlike people, advanced older students that had already worked in industry and had gone back to school for masters degree or whatever or had gone back for bachelors, but had already had bunch of experience.</li> <li>• Most of your 4th generation and leading edge technology is being taught by industry, and is not being taught by universities. We feel that is something universities need to get on line with. They need to know what industries needs are and start offering those courses.</li> <li>• Too many times we've seen especially in the computer end that they are sticking to older technologies and not keeping pace with where the industry is going. Consequently, we cannot take graduates that are out of school and put them into these environments without having some types of training. So, that forces us to not to accept these students that are out of school. They need to go somewhere to be trained before they come to us. When they get the baseline training, then we are able to take those that are capable and then make them better programmers and put them to use.</li> </ul>

TABLE 41 (Continued)

Respondent	Individual Responses
<u>Respondent A:</u>	<ul style="list-style-type: none"> <li>• It will be far better if the universities were at least teaching some of the latest concepts and getting into it with details, so that the people coming to us will have the baseline understanding of some of these concepts. So, when we put them out with older people or seniors people that have experience, they can pick up on it. So it is not difficult for them to immediately become productive.</li> </ul>
<u>Respondent B:</u>	<ul style="list-style-type: none"> <li>• In simulating situations both for management, sales people, and customers can alleviate fears of the unknown, whereby having access of the media and have a feel of the process especially new buyers. It all boils down to money. Customers want immediate gratification. They want information now, not 2 or 3 days later. They are constantly searching for information. Therefore, we have to be prepared to give them right then with inventories everywhere.</li> <li>• We have a job to do. To stay on top and ahead of the competition. The way we do things now are different. Customers can make a choice whether they would want to talk with an agent or not.</li> <li>• This technology allows us to track on response rate of each property we have out there. It allows us to determine how to invest, track the calls, and how many of those calls are transferred to the office. It gives us the response rate of each property, which in turn, give us the information on how to invest and where not to invest.</li> <li>• Now it takes 60 to 45 days to look for and close a home, we would want to do it in 2 to 3 days, even 3 seconds will be hilarious. We want to be 2 to 3 years ahead of the competition. We want to be at the leading edge of the competition. We are the only company in Oklahoma for the past one and half years with the system where customers can dial in and qualify themselves, access and get information in 2 minutes unlike going through a magazine that may take hours to get the same information.</li> </ul>



TABLE 41 (Continued)

Respondent	Individual Responses
<u>Respondent C:</u>	<ul style="list-style-type: none"> <li data-bbox="537 499 1399 716">• We are using CD-ROM all over the world. Our product line requires that our distributors know our product line. In order to any product, our distributors have to know how it works, e.g. different pressure valves and configurations. We do these by computer animations by putting all catalog information on a CD- ROM.</li> <li data-bbox="537 762 1399 1056">• We also use the Internet with our Web Site. Our searchable databases are used by our distributors for training and information distribution. We plan on using the Internet more and more. However, Internet's use is limited. It is too unorganized, too expensive, some of the information is erroneous, there is too much garbage, too much trash. There is certain time of the day that the Internet is so slow that you cannot get in.</li> <li data-bbox="537 1102 1399 1245">• I do not see it as the all and all of the library of information. It is not a good advertisement tool. We use it to tell people the type of business we are in, then, if they are interested they can contact us.</li> <li data-bbox="537 1291 1399 1507">• Our goal is to have the catalog on CD-ROM and on the Internet. Next step is to allow people to order through the Internet after they identify the product. That is where we are headed. We have to limit what we send to the Web because of our competitors. Though, we do not use the Internet for training.</li> </ul>
<u>Respondent D:</u>	<ul style="list-style-type: none"> <li data-bbox="537 1623 1399 1803">• I am excited about the technology. The service department was the first to use it. It was exciting to see employees being excited about it. To have interactive learning center is exciting. It is an exciting area as we go ahead in the year 2000. It is exciting, I won't mind wearing it out.</li> </ul>

TABLE 41 (Continued)

Respondent	Individual Responses
<u>Respondent E:</u>	<ul style="list-style-type: none"> <li>• We use the Internet for E-mailing only, and not for training.</li> <li>• I would like to see more interactive multimedia for training. I would like to see long distance learning more prevalent.</li> </ul>

Internet is so slow that you cannot get in.” Another respondent commented that the organization was not able to accept students from universities, but rather had to train them. This interviewee also commented that most 4<sup>th</sup> generation and leading edge technology was being taught by industry, and was not being taught by universities. Both of these responses indicate limitations relative to using the technology.

### Summary

In summary, this chapter presented the results of both parts of the study (survey and case studies). The survey results revealed how Human Resource Development professionals, trainers, and other business executives perceived interactive multimedia use for training. The total and individual activity level of specific types of media being used among organizations, and the training department activity in terms of leading and participating in IM activities. The case studies revealed in-department information about how and why interactive multimedia was used for training within specific organization contexts.

## CHAPTER V

### SUMMARY, DISCUSSION, AND IMPLICATIONS

#### Introduction

Interactive multimedia (IM) technology has been touted in the literature as the latest and greatest training tool ever used. Further, some experts have claimed that it is causing organizations to change from traditional ways of conducting business. Separating the hype and the reality generated by a new technology such as IM requires that systematically generated information be gathered and reported. The purpose of this study was to gain an understanding of how HRD professionals, trainers, and other business executives viewed IM use for training, and how and why this technology was being used for training. This chapter summarizes the study and includes discussion and implications.

#### Summary

The research objectives of this study were two-fold. The first objective was to gain an understanding of how HRD professionals, trainers, and other business executives in Oklahoma City profit-oriented organizations viewed IM use for training in their respective organizations.

Meeting this objective involved surveying profit-oriented organizations listed on the Major Employers List (MEL) (Oklahoma City Chamber of Commerce, 1995). The survey respondents included human resource and training professionals, business

managers and executives, and other business personnel. The organizations represented a variety of industries and characteristics. They had from 100 to more than 900 employees, had been in business from 1 year to more than 41 years, and had yearly sales that ranged from 1 to more than 81 million dollars.

The survey data provided information about the use of IM techniques, the training departments' roles, the evaluation of IM, the future of IM, and the obstacles to IM implementation. Highlights of the self-reported data included the following: (a) about half the respondent organizations reported that they have or were using IM, about 30% are using IM in an ongoing basis, and about 13 reported that they have used IM as a test or pilot, (b) all the IM activities in the have/are being used category were accounted for by 61% of the respondent organizations, and (c) IM usage varied across techniques: CD-ROM was used in 68.2% of the organizations, but none of the other technologies was used by more than 20% of the organizations.

Information was also obtained on the number of IM techniques that organizations implemented in three categories—have/are being used, have used in an on-going basis, and have tested or piloted. In the have/are being used category, 25% of the respondents reported that their organizations have or used one IM technique. However, the level of application dropped for each additional IM technique. For example, nine respondents indicated that they have or used two techniques and seven respondents indicated three techniques. A similar pattern was observed in the other categories (i.e., when respondents reported the use of IM in an on-going basis or as a test or pilot).

The survey data also revealed the training department's roles in implementing IM techniques. For each IM technique, the respondent indicated whether (a) the technique

was led by the training department and (b) the training department was not involved. The survey results showed the training department led the IM effort 26% of the time and 28% of the time was not involved. The role of the training department as a leader varied across specific techniques. For example, 60% of the Distance Learning activities were led by the training department; however, less than 20% of CD-ROM use was led by the training department. Further, none of the activity in EPSS, Laser Disc-ROM, and Virtual Reality was reported to have been led by the training department.

The survey data revealed that IM often was not evaluated or measured. However, when it was assessed, a variety of measures were used. Examples included formal and informal feedback evaluations; training evaluations; improvement in employee skills; surveys and research; increase in sales and bottom-line; conferences, other organization experiences, and magazines; and improvement in productivity.

The survey data included respondents' perceptions of IM trends and of where their organizations were heading with IM in the next three to five years. In identifying IM trends, respondents provided varied answers. The most frequent response relative to the organizations' IM use was employee training. Other responses focused on communication and information gathering.

The survey also included information on IM technology and training departments: 65% of the respondents indicated that IM is the competitive tool bag for effective trainers of the 90's and beyond; however, only about 50% indicated that IM will enable classroom delivered training to revitalize, create stronger training departments, and elevate the chief training officer's status. Further, about 66% of the respondents indicated that current training managers and staff are ill equipped for IM. Interestingly, half the respondents

disagreed that the function of the training department as we know it today will be fading out by 1997 and gone by 2002, but about 23% agreed with the statement.

Respondents used a checklist to identify obstacles to IM in their organizations. Each item in the list was identified as an obstacle by multiple respondents and, further, many respondents indicated that multiple obstacles existed in their organizations. The most frequently identified obstacles were that IM technology was not available in the organizations, the training department lacked the budget, and the training department was not up to date on IM. Other obstacles included lack of management support and employee resistance. The responses indicated that IM use in some organizations required overcoming barriers.

The survey also revealed information about training departments: 81% of the respondents viewed training as important or very important in their organizations, however, 13% viewed training as moderately important, and 6% indicated that it was not important. This data indicated that training, while important in a majority of organizations, was less or not important in some. Further, 44% of the respondents indicated that their organizations had a chief training officer. The title of the individual varied across organizations. Some of the reported titles included training manager, human resources or personnel manager, and training and development manager.

The second objective of this study was to obtain in-depth descriptive information of how and why IM was used for training within specific selected organizations. Meeting this objective involved gathering in-depth descriptive information in seven purposively-selected organizations. Structured interviews were used to gather the data. Highlights of the case study findings revealed that the individuals who were interviewed knew how the

technology was used within their organization to fulfil their training needs and, in general, were using the technology in response to the changes in the business contexts.

Specifically, organizations were using the technology for formal training, on the job training, retraining, and cross training. Other related activities included education, job orientation, modelling, drill and practice, case studies, testing, job enrichment or refresher, existing job, additional job, tutorial, demonstration, and simulation. IM technology for training was available in various ways including on-demand or walk-in, sign-up or appointment, training assignment, and the employees' own time. The technologies were accessed through network (Local Area Network, Wide Area Network, and World Wide Web), stand alone or portable workbench, or Electronic Performance Support Systems (job aid). One technology was accessed as an information station in the form of a kiosk. In addition, IM technologies were available on-site in all of the organizations. In some organizations they were available off-site and in some they were outsourced through a third party.

The data revealed various reasons why IM technology was used. Highlights of these reasons included: competition, both locally and globally, proactive (i.e., being ahead of the competition), economical, cost effective, time savings, business necessity, employee driven, customer driven, and technology driven. However, one organization indicated the reason for use was because the technology was in vogue. So while most of the use was in response to changes in the business contexts, it was not true in every organization.

The interviewees also provided additional information regarding IM use. For example, one person stated that IM was going to be a very strong supportive instructional

medium, another noted that the technology will enable the organization to stay ahead of the competition and closer to customers, and yet another described the ubiquitous use of CD-ROM to inform, train, and educate the organization's distributors all over the world. Still another expressed excitement in using the technology for training, and another indicated seeing more IM use for training especially in long distance learning.

Comparing the qualitative and quantitative data produced additional insight. The respondents' understanding of the specific barriers that had to be overcome in individual instances of implementing the technology seemed inconsistent with the perceptions of opportunities offered by the technology. That is, many survey respondents and interviewees identified the direction of IM in the next three years as being training. At the same time, actually using an IM technology for training required overcoming specific barriers within each organization.

### Discussion

This study provided research in the area of IM use for training in business and industry. It addressed the need to separate the hype and the reality surrounding this technology by providing specific information on how and why IM was being used in organizations.

The study's findings can be interpreted in light of previous work in this area. For example, the results of the survey are similar to and expand the knowledge gained from previous surveys. For example, the similarity of the results from this study which focused on organizations with 100 or more employees in one geographical metropolitan area of Oklahoma and the results of a 1993 ASTD study



which focused on Fortune 500 companies indicates that the diversity of IM use is not limited to large companies. One reason for the similarity may be that organizations used in both studies conducted their businesses within the same context—the American economic, social, and political milieu.

The findings of this study also supported the Oz and White (1993) study which found IM to be a rapidly growing field with training having a small share of the market. This study revealed that the training department was not involved in all the use of IM for training. Further, the data gathered in this study revealed that while many had expectations for future use of IM in training, the actual practice was more limited and varied.

This study also expanded knowledge of IM beyond previous research. There was more report of IM used as a test or pilot and have/are being used than there was actual on-going use. The actual on-going use was greatest in the lowest cost technology CD-ROM. Also, this technology had the lowest expert trainer involvement and learning curve. Also, the data revealed that organizations were not categorizing IM as a training/non-training tool. For example, many organizations were using IM for training as well as other various business endeavours. These organizations did not see training as a separate business activity, rather, training and non-training business functions seemed to overlap in the use of IM. While these organizations represented different industries, their individual IM use seemed contextually influenced.

The topic of IM use for training was complex and some of the findings were inconsistent. For example, 65% of the respondents indicated that IM is the

competitive tool bag for effective trainers of the 90's and beyond, but a much smaller percent of the organizations were using the technology. Further, while 81% of survey respondents viewed training as important or very important in their organizations, only half disagreed that the function of the training department as we know it today will be fading out by 1997 and gone by 2002, and only 44% of the respondents indicated that their organizations had a chief training officer.

Finally, the diffusion of IM technology was consistent with the pattern outlined by the Diffusion of Innovation model (Rogers, 1962). Some organizations could be categorized as innovator, early adopter, early majority, or late majority, and others fell in the laggard category.

### Implications

While efforts have been made to study the use of IM for training in Fortune 500 and other American companies, little or no study has been systematically done in organizations with one hundred (100) or more employees, especially in one region considered to be homogeneous in infrastructure. The study identified potential reasons for the slow and low adoption of the technology for training despite its potential benefits and success stories. These include lack of knowledge by human resource professionals and trainers on the technology's use for training.

From the perspective of systems theory, the lack of this knowledge could have many outcomes. For example, it could result in HRD professionals and trainers inability to justify the costs of applying this technology to training. Also, the lack of this necessary knowledge could result in the HRD professionals and trainers inability to convince

organization decision makers of the benefits of this technology for training, thereby stifling the organizations from gaining the benefits of adopting novel technologies in the early technology lifecycle. Additional research is needed to specify the exact relationship between the knowledge and skills of practitioners, the investment in technology, and the outcomes that benefit an organization. Such studies should address the issue of non-respondent bias. Further, because organizations did not see training and non-training related business activities differently in the application of this technology, research is needed to ascertain how organizations are integrating IM in other business activities. Studies should examine the nature of these activities and HRD involvement in their initiation, implementation, and actual use. Future studies are also needed that examine the relationships among the types of media, size of the company and involvement of the training department for different geographical locations.

The detailed description of the process used to implement the survey across organizations and the case studies provide a source of data for academicians and practitioners who want to gain a deeper understanding of IM usage. Two limitations of this study—that it focused on only one regional population and the low response rate to the survey—should be addressed in future studies. Also, future studies could expand this work by more precisely defining the categories to identify the precise relationships between having the IM, pilot testing it, and applying it on an on-going basis.

This study also had implications for practice. First, the level of IM usage for training when integrated with the identification of lack of knowledge as a barrier to IM implementation, challenge academicians to integrate knowledge and skills on IM

technology into HRD courses. Finally, HRD professionals including practitioners and academicians should use this and other studies to consider how they compare with others in using this technology in training and other business related activities. Research studies, conferences, and seminars can provide useful benchmarks as individuals and organizations increasingly apply the technology.

This study revealed that reports of IM use for training are neither all hype nor all truth. Instead, the study showed that the organizations are using the technology at various levels and in various ways to respond to a dynamic external environment. HRD practitioners and academicians who want to contribute strategically to their organizations need to use the technology in low-cost, high-gain ways to benefit their organizations. Given the results of this study, HRD professionals who have no knowledge of IM technology could benefit from gaining knowledge in at least one area.

This study provided academicians, technology manufactures, vendors, HRD professionals, trainers, and other business executives insight into the activity level of IM technology in profit-oriented organizations with one hundred (100) or more employees in one geographical region (Oklahoma City), it has also provided information on how and why the technology was used within specific organizations.

Given the results of this study, the extremes of future IM use for training are unlikely (e.g., that IM is a fad that will just fade away without impacting how training is really done or that all training in the future will be conducted using IM technology). The results indicate that IM technology has begun to contribute to training in business and industry. Further, the results also indicate that the process of

providing employees with knowledge and skills has combined in interesting ways with other business functions. The combinations vary by organization. HRD professionals can use this information to meet today's business needs and to prepare themselves, their departments and organizations for the future.

## REFERENCES

- Adam, J. A. (1993, March). Special report/multimedia applications, implications. IEEE Spectrum, 23-39.
- Adams, N. (1993). Virtual Reality—A training tool for the 90s. Journal of Instruction Delivery System 1(3), 37-39.
- Allen, B. S., & Carter, C. D. (1988). Expert systems and interactive video tutorials: Separating strategies from subject matter. Journal of Computer-Based Instruction, 15 (4), 123-130.
- Ambron, S., & Hooper, K. (1988). Interactive multimedia. Readmond, WA: Microsoft Press.
- ✓ American Society for Training and Development. (1993). National HRD Executive Survey.
- Amthor, G. (1991, September). Interactive multimedia in education concepts and technology trends and model applications megaMedia and knowledge systems. T.H.E. Journal, 2-5.
- Amthor, G. (1992-93). Multimedia in education: An introduction. (Multimedia Source Guide). T.H.E. Journal, 32-33.
- ✓ Anderson, W. E. (1995). Technology and the changing role of trainers. Orlando Multimedia '95 (DV 1-10). Warrenton, VA: Society for Applied Learning Technology.
- ✓ Atkinson, R. C. (1978, April). Futures: Where will computer- assisted instruction (CAI) be in 1990? [Special issue]. Educational Technology, 18 (4), 60.
- Babbie, E. R. (1973). Survey research methods. Belmont, CA: Wadsworth Publishing Company, Inc.
- Babbie, E. R. (1986). The practice of social research (4th ed). Belmont, CA: Wadsworth Publishing Company, Inc.
- Barbee, D.E., & Ofiesh, G. D. (1990). The new technology: Agent of transformation. Report on the Nationwide State of the Art, Washington, DC.
- Beach, D. S. (1985). Personnel and management of people at work. New York, NY: Macmillan Publishing Company.
- Becker, G. (1964). Human capital. New York: National Bureau of Economic Research.

- Berardinelli, P. K., Burrow, J. L.; & Jones, D. S. (1995). Management training: An impact theory. Human Resource Development Quarterly, 6 (1), 79-90.
- Bermac Communications. (1991, August). A multimedia success story. CBT Directions.
- Bogdan, R., & Biklen, S. (1992). Qualitative research for education (2nd ed.). Needham Heights, MA: Allyn and Bacon
- Boyett, J. H., & Conn, H. P. (1992). Workplace 2000: The revolution reshaping American business. New York, NY: Plume.
- ✓ Boynton, A. C., Victor, B., & Pine, B. J. (1993). New competitive strategies: Challenges to organizations and information technology. IBM Systems Journal, 32 (1), 40-64.
- ✓ Braden, P. V., DeWeaver, M. J., & Gillespie, L. (1991). Keeping U.S. companies competitive: technologists can and should contribute. Performance Improvement Quarterly, 4 (2), 47-61.
- Branson, R. K., & Zimpfer, P. M. (1994). A systems approach to performance support design: Project TREE. Orlando Multimedia '94 (pp. 164-167). Warrenton, VA: Society for Applied Learning Technology.
- Bunderson, C. V. (1978, April). Futures: Where will computer- assisted instruction (CAI) be in 1990? [Special issue]. Educational Technology, 18 (4), 62.
- Bushnell, D.S. (1990, March). Input, process, output: A model for evaluating training. Training and Development, 41-43.
- Camillo, P. (1995). Multimedia learning centers--Design and implementation. Orlando Multimedia '95 (DV 2-16). Warrenton, VA: Society for Applied Learning Technology.
- Charp, S. (1995). Editorial, T.H.E. Journal, 22 (7), 4-6.
- Chen, T. T., Barbee, D., Atwater, M., & Garton, R. (1994, February). Re-usable instructional strategy templates. Orlando Multimedia '94 (pp. 1-7). Warrenton, VA: Society for Applied Learning Technology.
- Citron, M. (1987). The future of American business: The U.S. in world competition. New York, NY: McGraw-Hill Book Company.
- Connelly, (Cited in Oz, E., & White, L. D. (1993, May). Multimedia for better training. Journal of Systems Management, 34-43.
- ✓ Copeland, P. (1992). The multimedia mix. Educational and Training Technology International, 28(2), 154-162.
- Craig, R. L. (Ed.). (1987). Training and development handbook. American Society for Training and Development. New York, NY: McGraw Hill Book Company.
- DeConzo, D. , & Robbins, S. (1988). Personnel/human resource management. Englewood Cliff, NJ: Prentice Hall.

- ✓ Dennis, V. (1993, Summer). Decreasing the risk of adopting new interactive instructional delivery technologies. Journal of Interactive Instruction Development, 17-20.
- ✓ Dennis, V. (1994). How interactive instruction saves time. Journal of Instruction Delivery Systems, 8 (1), 25-28.
- DeVellis R. F. (1991). Scale development: Theory and applications. Newbury Park, London: Sage Publications.
- Dictionary of Computing. (1990). Oxford Science Publications. New York, NY: Oxford Press.
- D/J Brush Associates. (1993, October). Fifth Brush Report. Training, 15.
- Dubin, L. (1996). Success with multimedia: More than just a great program. 34th International Society for Performance Improvement & Expo Annual Conference. Dubin Group.
- Fetterman, R. L. (1993). Multimedia networks for business. CD-ROM Professional, 6 (5), 78-81
- ✓ Filipczak, B. (1992, October). What employers teach (a demographic view of the students, the curriculum and the training methods of the corporate education system). Training, 43-54.
- Fletcher, (Cited in Oz, E., & White, L.D. (1993, May). Multimedia for better training. Journal of Systems Management, 34-43.
- Flynn, M., & Mandell, S. (1991). Microcomputers: Concepts, skills and applications. St. Paul, MN: West Publishing Company.
- Froiland, P. (1993, October). Who's getting trained. Training, 53-60.
- Galbreath, J. (1992, April). The educational buzzword of the 1990's: multimedia, or is it hypermedia, or interactive multimedia, or...? Educational Technology, 32 (4), 15-32.
- Gayeski, D. (1993a, April). De-mystifying multimedia. Communication World, 10 (4), 27-32.
- Gayeski, D. (Ed.). (1993b). Multimedia for learning. Englewood Cliff, NJ: Educational Technology Publications.
- ✓ Gery, G. J. (1991). Electronic performance support systems: Hows and why to remake the workplace through the strategic application of technology. Boston, MA: Weingarten.
- Gillespie, L., & Dobrovolny, J. (1996). Multimedia systems design. ISPI Conference.
- ✓ Greengard, S. (1993, September). How technology is advancing HR. Personnel Journal, 80-90.



- Gronbeck, C. (1993, Fall). Interactive multimedia training and the education systems for electric utilities. Journal of Instruction Delivery Systems, 25-29.
- Hall, D.T. (1988). Career development in organizations. San Francisco, CA: Jossey Bass.
- Harless, J. (1995). Performance technology skills in business: Implications for preparation. Performance Improvement Quarterly, 8 (4), 75-88.
- Hofstetter, F. (in press). Multimedia literacy. McGraw-Hill Book Company.
- Hoover, K. R. (1984). The Elements of social scientific thinking. New York, NY: St. Martin's Press.
- Huberman, A. M., & Miles, M. B. (1994). Data management and analysis methods. In Norman K. Denzin and Yvonna S. Lincoln (Eds.) Handbook of Qualitative Analysis. London: Sage.
- Hughes, R. (1992 February.) Time Magazine.
- ✶ Kearsley, G. (1988). Training and technology: A handbook for HRD professionals. Reading, MA: Addison-Wesley Publishing Company.
- Kearsley, G. (1990). Instructional technology and worker learning needs. Submitted to the office of Technology Assessment, Washington, DC.
- Khalil, T. M. (1993). Management of technology education for the 21st century. Industrial Engineering, 25 (10), 64-65.
- Kuhn, T. S. (1970). The structure of scientific revolutions. Chicago, IL: The University of Chicago Press.
- Laird, D. (1985). Approaches to training and development. Reading, MA: Addison-Wesley Publishing, Inc.
- Leedy, P.D. (1993). Practical research planning and design. New York, NY: Macmillan Publishing Company.
- Mason, E.J., & Bramble, W.J. (1989). Understanding and conducting research. New York, NY: McGraw-Hill Book Company.
- Merriam, S., & Simpson, E. (1984). A guide to research for educators and trainers of adult. Malabar, FL: Kreiger.
- McArdle, E. H. (1989, July) What is training? Performance and Instruction, 34-35.
- McLagan, P. A. (1989). The model: Models for HRD practice. Alexandria, VA: American Society for Training and Development.
- Miles, M., & Huberman, A. (1994). Qualitative data analysis: An expanded source book (2nd ed.). Newbury Park, CA: Sage.
- Miller, R. L. (1993, April). IBM Multimedia: Ten good reasons for multimedia training. Training, Advertising supplement, IBM, 5-6.

- Mills, D. Q. (1985). The new competitors. New York, NY: John Wiley and Sons.
- Mitchell, E. S. (1986). Multiple triangulation: A methodology for Nursing Science. Advances in Nursing, 8, 18-26.
- Murphy, L. A. (1992, May). DVI in organizational information retrieval and training. Educational Technology, 34-37.
- Naisbitt, J. (1994). Global paradox. New York, NY: William Morrow and Company, Inc.
- Nanry, C. (1988, Winter). Performance linked Training. Public Personnel Management, 17 (4), 457-463
- Oklahoma City Chamber of Commerce. (1995). Major Employers List.
- Oz, E., & White, L. D. (1993, May). Multimedia for better training. Journal of Systems Management, 34-43.
- Papert, S. (1993). The childrens' machine: Rethinking school in the age of computer. New York, NY: Basic Books.
- Patton, M. (1990). Qualitative evaluation and research methods. Newbury Park, CA: Sage.
- Phillips, J. (1991). Handbook of training and evaluation and measurement methods. Houston, TX: Gulf Publishing Company.
- Pina, A.A., & Savenye, W. C. (1992). Beyond computer literacy: How can teachers use interactive multimedia? Presented at the annual Conference of the Association for Educational Communication and Technology, Washington, DC.
- Piskurich, G. M. (Ed.). (1993). The ASTD handbook of instructional technology. New York, NY: McGraw Hill, Inc.
- Piz, P., & Jurras, J. (1995, February). Multi-Multimedia and methodologies. Orlando Multimedia '95 (DV-Thur 2-21). Warrenton, VA: Society for Applied Learning Technology.
- Puterbaugh, G., Rosenberg, M., & Sofman, R. (1989, November/December). Performance support tools: a step beyond training. Performance and Instruction, 1-5.
- Ragan, L. C. (1988, September). Hypercard—A user's description. TechTrends, 38-39.
- Ray, W. J., & Ravizza, R. (1988). Methods: Toward a science of behavior and experience. Belmont, CA: Wadsworth Publishing Co.
- Reich, R. (cited in BNAC Communicator, 1995, Fall). New Labor Dept. Report shows link between training and profit. BNAC Communicator, 14 (5), 1.
- Rogers, E. (1962). Diffusion of innovations. New York, NY: Free Press.

- Rummler, G. A., & Brache, A. (1995). Improving performance: How to manage the white space on the organization chart. San Francisco, CA: Jossey Bass.
- Russ-Eft, D. F. (1994). CBT, CAI, & Deja Vu. Human Resource Development Quarterly, 5 (3), 207-212.
- Sanders, D., & Birkin, S. (1980). Computers and management in a changing society. New York, NY: McGraw-Hill Book Company.
- Schien, E. H. (1988). A critical look at current career development theory and research. In Douglas T. Hall and Associates (Eds.), Career Development in organization. San Francisco, CA: Jossey-Bass.
- Schultz, T. (1961, March). Investment in human capital. American Economic Review, 5(1), 1-17.
- Schwier, R. (1987). Interactive video. Englewood Cliff, NJ: Educational Technology Publications.
- Senge, P. (1990). The fifth discipline: The art and practice of learning organizations. New York, NY: Doubleday/Currency.
- Seyer, P. (1989, February). Performance improvement with hypertext. Performance and Instruction, 22-28.
- Sherman, S. (1993, June). The new computer revolution. Furtune, 56-80.
- Singleton, R. Jr., Straits, B.C., Straits, M.M., & McAllister, R.J. (1988). Approaches to social research. New York, NY: Oxford University Press.
- Sleezer, C. M. (1990). The development and validation of a performance analysis for training model (Research Project #39). St. Paul: University of Minnesota, Training and Development Research Center.
- Sleezer, C. M. (1993). Training needs assessment at work: A dynamic process. Human Resource Development Quarterly, 4 3, 247-263.
- Smith, E. E. (1987). Interactive video: an examination of use and effectiveness. Journal of Instructional Development 10 (2), 2-10.
- Spitz, C. (1992, June). Multimedia training at Hewlett-Packard. Training and Development, 39-41.
- Spitzer, D. (1991, September). Training: What it is and how to use it appropriately. Performance and Instruction, 20-23.
- Stevens, G. H. (1989, July). Applying hypermedia for performance improvement. Performance and Instruction, 42-50.
- Stevenson, B. (1961). The home book of proverbs, maxims, and familiar phrases. New York: Macmillan and Co.
- Strong, C. (1992, March/April). Training with interactive technologies. Instructional Delivery Systems, 7-10.

- Swanson, R. A. (1982). Industrial training. In W.H. Mitzel (Ed.), 5th Encyclopedia of Educational Research. 864-970. New York, NY: Macmillan.
- Swanson, R. A., & Gradous, D. B. (1988). Forecasting the Financial Benefits of Human Resource Development. San Francisco: Jossey-Bass.
- Tapscott, D., & Caston, A. (1993). Paradigm shift: The new promise of information technology. New York, NY: McGraw Hill, Inc.
- Thurrow, L. (1993). Head to head: The coming economic battle among Japan, Europe, and America. New York, NY: Warner Books.
- Training. (1993, October). Industry report (an introduction to Training's annual analysis of employer sponsored train in the United States), 29-34.
- Training. (1995, October). 1995 industry report, 37-66.
- U.S. Labor Department. (1995, Fall). New Labor Dept. Report shows link between training and profit. BNAC Communicator, 14 (5), 1.
- Wager, W. W., Polkinghorne, S., & Powley, R. (1992). Simulations: Selection and development. Performance Improvement Quarterly, 5 (2), 47-64.
- Wall Street Journal. (1993). What will the process of work look like in the year 2000?
- Walter, B. (1993, February). Taking the byte out of systems rollouts. Training and Development, 34-36.
- Wood, D. (1993). Instructional Technology in the business environment. Interactive Multimedia '93 (pp 51-60). Warrenton, VA: Society for Applied Learning Technology.
- Woollard, R., & Morrison, S. (1995). Just-in-Time Learning. Orlando Multimedia '95 (DV 2-16). Warrenton, VA: Society for Applied Learning Technology.
- Wright, S. R. (1979). Quantitative methods and statistics: A guide to social research. Beverly Hills, CA: Sage publications.
- Yin, R. K. (1989). Case study research: Designs and methods. Newbury Park, London: Sage Publications.
- Yin, R. K. (1993). Applications of case study research. Newbury Park, London: Sage Publications.
- Zemke, R. (1991, September). Shell scores high with interactive video. Training, 33-38.

## APPENDIXES

APPENDIX A

PROFIT-ORIENTED ORGANIZATIONS—1995

OKLAHOMA CITY CHAMBER OF

COMMERCE MAJOR

EMPLOYERS LIST

(MEL)

NAME OF ORGANIZATION	TYPE OF BUSINESS
AAR Oklahoma Inc.	Aircraft servicing & maintenance
A-Bear's janitorial service Inc.	Janitorial service
AMIRS Teleservice Resources	Telemarketing services
API Enterprises, Inc.	Polyethylene Material & Products
AT&T Network Systems	Telecommunications
A & W Maintenance Services	Janitorial & groundkeeping service
Alliance Real Estate	Real Estate
Altec Lansing Corporation	Audio products
American Deposit Ins. Co.	Non-standard auto insurance
American Fidelity Group	Ins., financial serv. & real estate
American Fidelity Ins.	Ins. agents, brokers & service
American Floral Services	Floral wire service
Anson Gas Corporation	Oil & gas exploration & dev.
Arthur Anderson & Co.	Certified Public Accountants
C.R. Anthony Co.	Retail clothing store
Applewood's Inc.	Restaurant/meeting facilities
Asplundh Tree Expert Co.	Tree trimming contractor
BTI Systems, Inc.	Document processing/machine manufac.
Abnk IV, N.A.	Banking
Bank of Oklahoma, N.A. OKC	Banking
Bank One, OKC	Banking
Benham Group Inc., The	Architecture/engineering
Bethany Hospital & Pavilion	General hospital
Bethany Village Healthcare Center	Skilled nursing care facility
Blue Cross & Blue Shield of Okla.	Health Insurance
BLueLincs HMO	Health Ins. organization
Boatmen's 1st National Bank of OK	Banking
The Boeing Co.	Airplane parts manufacturer
Bonary Drilling Co.	Drilling contractors
Borden, Inc., Dairy Div.	Dairy products manufacturer
Boyd's Chevrolet & Geo	Auto sales
W.H. Braum, Inc.	Retail Dairy products
Bridgestone/Firestone, Inc.	Auto tire manufacturer
Brittian Brothers	Auto parts supplier
Bryson, Inc.	Beer and ale wholesale
Building Owners & managers Assn.	Real estate
The CIT Group/Sale Financing	Financial service
CMI Corporation	Construction equip. manufacturer
CPC Southwind Hospital	Hospital
CVR Corp.	Food & meat processors
Cain's Coffee Co.	Roasting & grinding of coffee & tea
Canteen Service Co.	Full-line food & vending service

Canterbury Retirement Community	Skilled nursing care
Cato Oil & Grease Co.	Lubricating oils/grease manufacturer
Cellular One	Mobile phone equip & supplies
Central Liquor Co.	Liquor wholesale
Central OK Medical Group	Medical services
Central OK Trans/Park Authority	Transportation/parking services
Central Plastic Co.	Oil/gas production manufacturer
Central Sales Promotions, Inc.	Screen Printing
Century Martial Arts Supply, Inc.	Uniforms/accessories supplier
Chromalloy Div. OK	Repair/overhaul of aircraft engine
Cintas Corp.	Uniform rental service
City Bank & Trust Co.	Banking
Clements Food Co.	Food producer/package/delivery
Climate Master, Inc.	Air conditioning/heat equip
Coachman Inc.	Hotels and motels
Coates Field Service, Inc.	Acquisition contractors
Comm. Bank & Trust Co.	Banking
Conoco, Inc.	Oil/gas exploration/dev.
Cooper Oil Tool	Oilfield valves/choke manufacturer
Jack Cooper Trans. Co. Inc.	Auto trans./driveway
Jackie Cooper Enterprises	Auto dealers
Coreslab Structures OK	Pre-cast concrete manufacturer
Corken, Inc.	Pump/compressor manufacturer
Cox Cable OKC, Inc.	Cable TV
Crowe-Dunlevy	Legal services
D & M Distribution Serv.	Public/private warehouse
Dana Corp.	Wholesale manufacturer/retail/new
Darr Equip. Co.	Contractors equip/supplies
Ted Davis Manufacturing	Computer supplies/parts
Wm. E. Davis & Sons, Inc.	Grocers/wholesales
Dealers Auto Auction of OKC	Auto auction
Deluxe Check Printers	Printers/commercials
Devon Energy Corp.	Independent oil/gas operators
Dillard Dept. Stores	Retail sales
Dolese Bros. Co.	Ready-mix concrete/crushed stone
Donco Carriers, Inc.	Trucking-motor freight
Doskocil/Wilson Foods Corp.	Food processors/manufacturer
Downtown Airpark, Inc.	Aircraft servicing/manufacturer
Louis Dryfus Natural Gas Corp.	Oil/gas exploration/dev.
EMSA	Ambulance service
Eatries, Inc.	Restaurants
Edmond Regional Medical Center	General hospital
Embassy Suites	Hotel
Enogex Inc.	Pipe line
Epworth Villa	Retirement Communities/homes



Joe Esco Tire Co.	Retail tire dealers
Evans Co.	Retail furniture dealers
FKW Inc.	Architects
Farley Foods, USA	Confectionery manufacturer
Fife Corp.	General industrial machinery/equip.
1st National Bank-Midwest City	Banking
Flserv	Data processing service
Fleming Co., Inc.	Wholesale food distributor
Flintco, Inc.	General contractors
Four Seasons Nursing Center-N.W.	Skilled nursing care
Fox Building Supply	Retail building materials
Fox-Smythe Transportation	Transportation brokers/consultants
C.L. Frates & Co.	Ins. agents/brokers/services
General Motors Corp.	Assembly of passenger autos.
Gilardi Foods	Food products
Global Life & Accident Ins. Co.	Insurance
Governair Corp.	Equipment
Grace Petroleum Corp.	Oil & gas exploration/production
Great Plains Coca-Cola Bottling	Soft drinks bottlers
Guaranty Bank & Trust Co.	Banking
C.H. Guernsey & Co.	Consulting engineers/architects
Gulfstream Aerospace Technologies	Aircraft parts/sub-assemblies
HTB, Inc.	Engineers/surveyors
Hardee's Food Systems, Inc.	Restaurant
Haskell Lemon Construction Co.	Asphalt paving/highway construction
Healthcor	Health care services
Healthsouth Rehab. Hospital	Rehab. services
Hertz Data Center	Data processing/communications
Hertz Reservation Center	Rental car reservation
Lynn Hickey Dodge	Auto dealers
Hiland/Gilt Edge Farms, Inc.	Dairy products
Hitachi Computer Products, Inc.	Manufacturer of computer peripherals
Hobby Lobby Creative Center	Retail arts/crafts supplies
Holiday Inn West/airport	Hotels/motels
Homeland Stores, Inc.	Retail/wholesale grocery chain
Hormel Fine Frozen Foods	Food/meat processing
Hospitality Franchise Systems	Hotel reservation
Bob Howard Auto Mall	Auto dealers
Hudiburg Chevrolet	Auto dealers
Hudiburg Nissan-Buick	Auto dealers
Hunzicker Brothers	Wholesale indus. electric equipment
Hyde Drug Inc.	Retail druggist sundries
ITT Hartford	Insurance
IBM Corp.	Computer dealers
International Environmental Corp.	Aircon/fan coil unit manufacturer

Interurban Restaurants, Inc.	Restaurants
Jacks Service Co.	Beauty products
Johnies Charcoal Broiler	Restaurants
Fred Jones Auto Group	Auto dealers
Fred Jones Industries	Holding companies
Fred Jones Manufacturing Co.	Auto engine rebuilding
W.J. Jones & Co., Inc.	Food brokers
Jordan-Delaurenti, Inc.	Training program designing/dev.
Journal Record Publishing	Newspaper & publishing
KF Industries, Inc.	Manufacturer of valves
KFOR-TV	TV stations/broadcasting
KOCO-TV	TV station/broadcasting
KWTV channel 9	TV station/broadcasting
Kenrob & Associates, Inc.	Data processing services
Kerr-McGee Corp.	Oil/petroleum/chemical/drilling
Kimray, Inc.	Corvascope/gravitometers/valves
Kraft Foodservice	Food service
Lamson & Sessions Co.	PVC pipe
L & S Auto Products	Steel bearings
L S B Industries, Inc.	Machine tools/metal cutting
Langsam Health Services	Nursing home medical/pharmacy
Langston Co.	Dept. store
Lazy E. Arena, Inc.	Rodeo arena
Liberty Natl. Bank & Trust Co.	Banking
Little Giant Pump Co.	Pump/pumping equipment
Local Fed. Bank, FSB	Savings & loan
Love Box Co.	Corrugated shipping containers
Love's Country Stores, Inc.	Convenience stores
Lyntone Belts, Inc.	Mens leather goods manufacturer
MRM OK Properties	Apartment rental agencies
Macklanburg-Duncan Co.	Aluminum extruded products
Mail-Well Envelope	Envelope manufacturer/wholesale
Manhattan Construction Co.	General construction
Marriot Hotel	Hotel
Marriot Mgt. Serv.	Building maintenance
Martinaire of OK, Inc.	Delivery service
Mathis Brothers Furniture Co.	Retail furniture dealer
McAfee & Taft	Attorneys
McAllister & Reed, Inc.	Restaurant management
McBride Clinic	Medical clinic
McKinney Stringer & Webster	Attorneys
Medallion Hotel	Hotel
Medical Arts Lab. Inc.	Medical testing
Metal Container Corp.	Metal cans
Mid-Continent Life Ins.	Life Insurance

Mid South Restaurants	Restaurants
The Midland Group	Financial service
Midwest Trophy Co.	Manufacturer/engravers/trophies
Miller-Norris Serv., Inc.	Wholesale janitorial supplies
Mobile Chemical Co.	Polypropylene film
Montgomery Ward & Co.	Dept store
Bob Moore Cadilac	Auto dealer
Mustang Fuel Corp.	Oil & gas exploration/dev.
National Check Cashers	Check cashing service
New York Life Ins.	Life insurance
Normac Foods, Inc.	Food & meat processing
Nuway Serv. Inc.	Linen supply service
Oak Tree Golf Club	Golfing club
Okla. Allergy Clinic	Diagnosis/treatment
Okla. City Clinic	Medical clinic
OKC. Golf & Country Club	Golf course/club
Okla. Farm Bureau Mutual Ins.	Insurance
Okla. Farmers Union	Brokers & service
OG & E Electric	Industrial utility sales
Okla. Kenworth	Truck dealers
Okla. Graphics	Commercial printing
Okla. Natural Gas Co.	Gas Company
Okla. Publishing Co.	Newspaper publishing
Okla. Tank Lines, Inc.	Tank transportation
The Olive Garden Italian Rest.	Restaurant
Orbit Finer Foods, Inc.	Food processor/manufacturer
Organon Tenika Corp.	Medical equipment
OXY USA Inc.	Crude oil/natural gas manufacturer
Pacesetter Corp.	Home improvement
J.C. Penney Co.	Dept. store
Pepsi Cola Co. of OKC.	Beverage manufacturer/distributor
Phillips Petroleum Co.	Petroleum/oil
Pratt Foods, Inc.	Retail grocer
Presbyterian Hospital, HCA	General hospital
Price-Edwards-Henderson & Co.	Commercial real estate leasing
Public Supply Co.	Wholesale building materials
Quail Plaza IGA	Retail grocers
The Radisson Inn OKC.	Hotel
Rainbo Baking Co.	Bread & buns baker
Ralston Purina Co.	Pet food manufacturer
Remington Park	Race track
Reserve Natural Ins. Co.	Insurance
Reynolds & Reynolds	Business form manufacturer
Dub Richardson Ford, Inc.	Auto dealers
Safety & Security Serv.	Security guard/patrol serv.

Sam's Club	Warehouse merchandise
Sam's Wholesale Warehouse	Discount stores
Santa Fe Railway Co.	Railroad
Seagate Technology, Inc.	Manufacturer of computer disk drives
Sears Roebuck & Co.	Dept stores
Sears Roebuck & Co.	Dept stores
Sears Roebuck & Co.	Dept stores
Security General Life Ins. Co.	Health ins.
Seven Eleven Stores	Retail grocers
Shangri-La Resort & Conference	Resorts
Shawver & Sons Inc.	Electric engineers
Shoney's	Restaurant
John Smicklas Chevrolet	Auto dealers
Smith & Nephew Dyonics Video Div.	Medical equipment
Snyder's Food Marts	Retail grocers
Sonat Exploration Co.	Oil & gas exploration/dev.
Sonic Industries, Inc.	Restaurants
Southwest Electric Co.	Electrical manufacturer
Southwest medical Center	General hospital
Southwestern Bell Tele. Co.	Telecommunications
Standard Life & Accident Ins.	Life/accident/health ins.
Southwestern Roofing & Metal Co.	Roofing contractors
The Spaghetti Warehouse	Restaurant
Staff One, Inc.	Employment serv./employee leasing
Star Building Systems	Pre-engineered metal building
W.H. Stewart Co.	Steel fabricators
SYSCO Food Service of OK	Food brokers
T.B.C. Fabrication Inc.	Steel fabrication
TDK Ferrite Corp.	Magnets/magnet powder
TVC Marketing Associates	Motor club
Target Stores	Discount stores
Travelers Motor Club, Inc.	Motor club
Trinity Industries, Inc.	Railroad cars/manufacturer
Trison Properties Inc.	Management consultants
R.R. Tway, Inc.	Construction Co.
USF&G Insurance Co.	Insurance
Unit Parts Co.	Stators & alternator remanufacturer
Unit Design Corp.	Giftware figurines manufacturer
United Engines	Diesel engine parts
United Parcel Service	Delivery service
Val Gene Associates	Restaurant group
VES Enterprise	Janitorial services
W & W Steel Co.	Steel fabricators
Wal-Mart Stores, Inc.	Discount stores
Waterford Hotels	Hotel

Wattie Wolfe Mechanical  
Willow View Hospital  
WIX/Dana Corp.  
Xerox Corp.  
Xerox Corp. Plant  
York Intl. Central Envi. Systems

Mechanical contractors  
Psychiatric hospital  
Dry air filter manufacturer  
Copying machines & supplies  
Photoreceptors manufacturer  
Light Comm. heating and a/c equip.

APPENDIX B

NON PROFIT-ORIENTED ORGANIZATIONS—1995

OKLAHOMA CITY CHAMBER OF COMMERCE

MAJOR EMPLOYERS LIST (MEL)

NAME OF ORGANIZATION	TYPE OF BUSINESS
Bone & Joint Hospital	Specialty hospital
Casady School	Private school
The Children Center	Hospital
City County Health Dept.	Medical/related clinics/education
City of Edmond	Municipal government
City of Midwest City	Municipal government
City of Moore	Municipal government
City of Norman	Municipal government
City of OKC.	Municipal government
County of Okla.	Municipal government
Deaconess Hospital	General hospital
Fed. Aviation Admin.	Fed. Regulatory/training
Federal Correctional Inst.	Medium level adult male prison
Federal Reserve Bank	Federal reserve bank
Feed the Children	Social service Organization
Francis Tuttle AVTC	Vo-tech education
Griffin Memorial Hospital	Acute in-patient psychiatric care
High Pointe Psychiatric Center	Hospital
Hillcrest Health Center	General hospital
Mercy Health Center	General hospital
Metropolitan Library System	County-wide library-information
Metro Tech Vo-Tech Centers	Vocational-technical training
Midwest City Regional Hosp.	General hospital
Millwood Public Schools	Public school
Norman Regional Hosp.	General hospital
OK Blood Institute	Blood center
OK Christian Univ. of Arts/Sci.	Private University
OKC. Air Logistics Center	U.S.A.F. base/logistics
OKC. Community College	College
OKC. Housing Authority	Government housing agency
OKC. Public Schools	Schools-public
OKC. University	Private college
OKC. Zoo	Zoological park
OK Employment Security Commission	Government agency
OK Goodwill Industries	Social service organization
OK Health Sys./Baptist Med.	Healthcare
OK Medical Research Fdtn.	Medical research
OK Memorial Hospital	General hospital
OK State University--OKC.	College/technical education
Putnam City Public Schools	Public school
Red Rock Mental Health Center	Mental health center
Rose State College	College

St. Anthony Hospital  
Salvation Army  
Southern Nazarene Univ.  
State Fair of Okla.  
State of Oklahoma  
Tinker Credit Union  
United States Army RCTG BN  
United States Postal Service  
U.S. Postal Serv./Tech Training  
Univ. of Central Oklahoma  
Univ. of Oklahoma  
Univ. of OK Health Sci. Center  
V.A. Medical Center

General hospital  
Social services  
Private University  
Fairgrounds  
State Government  
Credit union  
U.S. Armed services recruiting  
Mail delivery service  
Postal technical training  
State University  
State University  
Medical/dental education  
Hospital complex



APPENDIX C

AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT (ASTD)

PERFORMANCE SUPPORT AND INTERACTIVE MEDIA

SURVEY INSTRUMENT



Survey I: 1993

Panel ID #:

TOPIC: Performance Support and Interactive Media

1. Please check all areas that apply to your organization for the following "techniques":

Performance Support	Have/are being used	Used as a test or pilot	Used in an ongoing basis	Led by Training Dept.	Training Dept. not involved
1. FEA (formal front end analysis)					
2. Work redesign/reengineering					
3. Changed compensation/rewards system					
4. JIT information/job aids					
5. Documentation					
6. Hypermedia					
7. Others:					

2. Please check all areas that apply to your organization for the following "techniques":

Interactive Media	Have/are being used	Used as a test or pilot	Used in an ongoing basis	Led by Training Dept.	Training Dept. not involved
1. Level III interactive video					
2. CD ROM					
3. Electronic job aids					
4. Expert systems					
5. Electronic performance support systems (EPSS)					
6. Distance learning					
7. Simulators					

Interactive Media	Have/are being used	Used as a test or pilot	Used in an ongoing basis	Led by Training Dept.	Training Dept. not involved
8. Others:					

3. Briefly describe how your organization evaluates and measures the effectiveness of performance support and interactive media.

Performance support:

Interactive media:

4. Briefly describe where you see your organization heading in performance support and interactive media in the next three to five years.

Performance support:

Interactive media:

5. The functions of the training department as we know it today will be fading out by 1995 and gone by 2000.

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

6. The use of performance support and interactive media will enable classroom delivered training to revitalize, create stronger training departments, and elevate the chief training officer's status.

Performance support:

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

Interactive media:

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

7. Performance support, coupled with interactive media, is the competitive tool bag for effective trainers of the 90's and beyond.

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

8. Current training managers and staffs are ill equipped for performance support and interactive media.

Performance support:

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

Interactive media:

- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree

9. What are the obstacles to performance support and interactive media in your organization? (Please check all that apply)

Performance support:

- Lack of management support  
 Lack of training budget  
 Employee resistance  
 Performance support methods not available in your organization  
 Training department is not up to date on performance support  
 No obstacles are present  
 Other \_\_\_\_\_

Interactive media:

- Lack of management support  
 Lack of training budget  
 Employee resistance  
 Interactive media technology not available in your organization  
 Training department is not up to date on interactive media  
 No obstacles are present  
 Other \_\_\_\_\_

10. What trends do you see coming in the area of performance support and interactive media?

Performance support:

Interactive media:

11. Which of the following industries does your organization represent?

- Agriculture and Food Products
- Chemical and Allied Products
- Communications
- Consumer Products
- Diversified Services
- Electronics
- Energy Products
- Financial Services
- Manufacturing
- Retail
- Other \_\_\_\_\_

12. How important is the role of training in your organization?

- Very important
- Important
- Moderately important
- Not very important
- Not important at all

13. Does your organization have a chief training officer?

- Yes
- No

If YES, what is the title of that person?

\_\_\_\_\_

14. How strongly do you feel the Clinton administration's emphasis on workplace learning will impact the future of training in your organization?

- Very strong impact
- Strong impact
- Moderate impact
- Little impact
- No impact

The next survey will address the topic of HRD's role in quality management. Please list the issues you would like covered on this survey.

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

APPENDIX D

INTERACTIVE MEDIA SURVEY INSTRUMENT

## TOPIC: Interactive Media Use Among Oklahoma City Profit-Oriented Organizations

Part I

- a. Name of survey respondent: \_\_\_\_\_
- b. Title: \_\_\_\_\_
- c. Your company name: \_\_\_\_\_
- d. Number of employees: \_\_\_\_\_
- e. Number of years in business: \_\_\_\_\_
- f. Approximate amount of yearly sales: \_\_\_\_\_

Part II

Please check all areas that apply to your organization for the following "techniques":

	Interactive Media	Have/are being used	Used as a test or pilot	Used in an ongoing basis	Led by training Dept.	Training Dept. not involved
1.	Level III interactive video					
2.	CD-ROM					
3.	CD interactive					
4.	Digital video interactive					
5.	Expert systems					
6.	Laser Disc ROM					
7.	Electronic performance support systems (EPSS)					
8.	Distance learning					
9.	Simulators					
10.	Virtual Reality					
11.	Other					

12. Briefly describe how your organization evaluates and measures the effectiveness of interactive media.
13. Briefly describe where you see your organization heading in interactive media in the next three to five years.

**Please check each item that corresponds to your answer**

14. The function of the training department as we know it today will be fading out by 1997 and gone by 2002.
- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree
15. The use of interactive media will enable classroom delivered training to revitalize, create stronger training departments, and elevate the chief officer's status.
- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree
16. Interactive media is the competitive tool bag for effective trainers of the 90's and beyond.
- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree
17. Current training managers and staff are ill equipped for interactive media.
- Strongly agree  
 Agree  
 Neither agree nor disagree  
 Disagree  
 Strongly disagree



18. What are the obstacles to interactive media in your organization?
- Lack of management support
  - Lack of training budget
  - Employee resistance
  - Interactive media technology not available in your organization
  - Training Department is not up to date on interactive media
  - No obstacles are present
  - Other \_\_\_\_\_
19. What trends do you see coming in the area of interactive media?

20. Which of the following industries does your organization represent?

- Agricultural and Food Products
- Chemical and Allied products
- Communications
- Consumer Products
- Diversified Services
- Electronics
- Energy Products
- Financial Services
- Manufacturing
- Retail
- Other \_\_\_\_\_

21. How important is the role of training in your organization?

- Very important
- Important
- Moderately important
- Not very important
- Not important at all

22. Does your organization have a chief training officer?

- Yes             No

If YES, what is the title of that person? \_\_\_\_\_

APPENDIX E

FIRST COVER LETTER

## OKLAHOMA STATE UNIVERSITY



College of Education  
 School of Occupational and Adult Education  
 204 Willard Hall  
 Stillwater, Oklahoma 74078-4045  
 405-744-6275  
 Fax 405-744-7758

Dear XXXX:

May 13, 1996

I am conducting a survey for my doctoral dissertation at Oklahoma State University on the topic of interactive media use among for-profit oriented organizations in Oklahoma City. The survey will provide information about the extent of interactive multimedia use, organizational and training departments' perceptions, and the changes caused by using the media.

Interactive multimedia has been touted as the latest and greatest training technology tool ever used in organizations. But the literature contains little systematically gathered and reported information concerning how the technology is actual being used by Human Resource Development and training professionals within and across organizational contexts.

As one of the major employers listed in the Oklahoma City Chamber of Commerce Major Employers List, your organization was selected for inclusion in the study. Even if your organization does not use interactive multimedia, your participation is crucial to the success of this study. Confidentiality is assured as the results of the survey will not be reported by individual organization name.

The survey is coded for follow-up, and some organizations will be selected to participate in a follow-up study. I will be happy to send the results of the study to you when it is completed. Check below if you would like to participate in a follow-up study or want a copy of the survey results.

- a. Follow-up study: Yes [ ] No [ ]  
 b. Copy of results: Yes [ ] No [ ]

(Please provide name and address)

Please return the survey in the enclosed self-addressed postage-paid envelope by May 20, 1996. If you have any question(s) about the survey, please contact me or my advisor, Cathy Sleezer, Ph.D., Assistant Professor of HRD at (405) 744-9197.

Thank you for your time and cooperation.

Sincerely,

Bede Anyanwu  
 Doctoral Student

The Campaign for OSU



**APPENDIX F**

**FOLLOW-UP COVER LETTER**

## OKLAHOMA STATE UNIVERSITY



College of Education  
 School of Occupational and Adult Education  
 204 Willard Hall  
 Stillwater, Oklahoma 74078-4045  
 405-744-6275  
 Fax 405-744-7758

Dear XXXX:

May 27, 1996

I am conducting a survey for my doctoral dissertation at Oklahoma State University on the topic of interactive media use among for-profit oriented organizations in Oklahoma City. The survey will provide information about the extent of interactive multimedia use, organizational and training departments' perceptions, and the changes caused by using the media.

I sent to you a copy of the enclosed survey on May 13, 1996, but as yet have had no reply. I realize how easy it is to overlook a survey at this time of the month, but your participation is utterly important.

Interactive multimedia has been touted as the latest and greatest training technology tool ever used in organizations. But the literature contains little systematically gathered and reported information concerning how the technology is actual being used by Human Resource Development and training professionals within and across organizational contexts.

As one of the major employers listed in the Oklahoma City Chamber of Commerce Major Employers List, your organization was selected for inclusion in the study. Even if your organization does not use interactive multimedia, your participation is crucial to the success of this study. Confidentiality is assured as the results of the survey will not be reported by individual organization name.

Some organizations will be selected to participate in a follow-up study. I will be happy to send the results of the study to you when it is completed. Check below if you would like to participate in a follow-up study or want a copy of the survey results.

- a. Follow-up study: Yes [ ] No [ ]  
 b. Copy of results: Yes [ ] No [ ]  
 (Please provide name and address)

Please return the survey in the enclosed self-addressed postage-paid envelope by June 1, 1996. If you have any question(s) about the survey, please contact me at phone/fax (405) 348-8274, Box 5961 Edmond, OK 73083 or my advisor, Cathy Sleezer, Ph.D., Assistant Professor of HRD at (405) 744-9197.

Thank you for your time and cooperation.

Sincerely,

Bede Anyanwu  
 Doctoral Student



The Campaign for OSU

APPENDIX G

SECOND FOLLOW-UP COVER LETTER

## OKLAHOMA STATE UNIVERSITY



College of Education  
 School of Occupational and Adult Education  
 204 Willard Hall  
 Stillwater, Oklahoma 74078-4045  
 405-744-6275  
 Fax 405-744-7758

Dear xxxx:

June 17, 1996

I am conducting a survey for my doctoral dissertation at Oklahoma State University on the topic of interactive media use among for-profit oriented organizations in Oklahoma City. The survey will provide information about the extent of interactive multimedia use, organizational and training departments' perceptions, and the changes caused by using the media.

I sent to you a copy of the enclosed survey on May 13 and 27, 1996, but as yet have had no reply. I realize how easy it is to overlook a survey at this time of the month, but your participation is utterly important.

Interactive multimedia has been touted as the latest and greatest training technology tool ever used in organizations. But the literature contains little systematically gathered and reported information concerning how the technology is actual being used by Human Resource Development and training professionals within and across organizational contexts.

As one of the major employers listed in the Oklahoma City Chamber of Commerce Major Employers List, your organization was selected for inclusion in the study. Even if your organization does not use interactive multimedia, your participation is crucial to the success of this study. Confidentiality is assured as the results of the survey will not be reported by individual organization name.

Some organizations will be selected to participate in a follow-up study. I will be happy to send the results of the study to you when it is completed. Check below if you would like to participate in a follow-up study or want a copy of the survey results.

a. Follow-up study: Yes  No

b. Copy of results: Yes  No

(Please provide name and address)

Please return the survey in the enclosed self-addressed postage-paid envelope by June 29, 1996. If you have any question(s) about the survey, please contact me at phone/fax (405) 348-8274, Box 5961 Edmond, OK 73083 or my advisor, Cathy Sleezer, Ph.D., Assistant Professor of HRD at (405) 744-9197.

Thank you for your time and cooperation.

Sincerely,

Bede Anyanwu  
 Doctoral Student

The Campaign for OSU



**APPENDIX H**

**NAMES OF EXPERT REVIEWERS**



## NAMES OF EXPERT REVIEWERS

Dianna Brickner, Ph.D.

Instructional Design and Development/Educational Computing  
Darryl L. Sink & Associates, Monterey, California

Tom Elledge

Performance Technology Manager, Intel Corporation, Chandler, Arizona

Allison Hickox

Technical Trainer, Hewlett-Packard Company, Boise, Idaho

Bruce Jones

Manager, Education SWB Communications, Oklahoma City, Oklahoma

Dean Martens

Training Manager, Charles Machine Works, Perry, Oklahoma

Richard Menor

Distance Learning Coordinator, U.S. Postal Technical Center, Norman, Oklahoma

Candace Peeples

Performance Consultant, SBC Corporation, St. Louis, Missouri

Tiffany Wood

Instructional Designer, Digital Equipment Corporation, Maynard, Massachusetts

**APPENDIX I**

**CASE STUDY INTERVIEW GUIDE**

In-depth descriptive information of how  
interactive multimedia is used within  
specific organizational contexts

Contact Person: \_\_\_\_\_

Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Type of Business: \_\_\_\_\_

Address: \_\_\_\_\_

Location of Interview: \_\_\_\_\_

Date: \_\_\_\_\_

Questions

1. How is your organization using interactive multimedia for training?

a. for performance improvement

- |  |  |                                     |
|--|--|-------------------------------------|
| <input type="checkbox"/> formal training           | <input type="checkbox"/> on the job training | <input type="checkbox"/> retraining |
| <input type="checkbox"/> education                 | <input type="checkbox"/> cross training      |                                     |
| <input type="checkbox"/> job orientation           | <input type="checkbox"/> gaming              | <input type="checkbox"/> modeling   |
| <input type="checkbox"/> drill/practice            | <input type="checkbox"/> case studies        | <input type="checkbox"/> testing    |
| <input type="checkbox"/> information dissemination |  | <input type="checkbox"/> other      |

b. For performance support

- |   |  |
|---|--|
| <input type="checkbox"/> job enrichment/refresher | <input type="checkbox"/> existing job      |
| <input type="checkbox"/> additional job           | <input type="checkbox"/> embedded training |
| <input type="checkbox"/> tutorial                 | <input type="checkbox"/> demonstration     |
| <input type="checkbox"/> simulation               | <input type="checkbox"/> other             |

2. How is training available using interactive multimedia?  
availability with interactive multimedia

a. Training

- |  |  |                                |
|--|--|--------------------------------|
| <input type="checkbox"/> on-demand/walk-in   | <input type="checkbox"/> sign-up/appointment |                                |
| <input type="checkbox"/> training assignment | <input type="checkbox"/> employee own time   | <input type="checkbox"/> other |

3. How is interactive multimedia available?

a. Interactive multimedia availability

- |                                  |                                   |                                    |                                |
|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|
| <input type="checkbox"/> on-site | <input type="checkbox"/> off-site | <input type="checkbox"/> outsource | <input type="checkbox"/> other |
|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench       EPSS ( ) job aid
- information stations (kiosks)
- networked ( ) LAN ( ) WAN ( ) WWW/Internet
- other

## 5. Why is your organization using interactive multimedia?

- competition ( ) local ( ) global
- proactive (ahead of the competition)
- economical                               cost effective
- time savings                               business necessity
- employee driven                               customer driven
- technology driven                               in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

APPENDIX J

SAMPLE OF CONSENT INTERVIEW LETTERS

## OKLAHOMA STATE UNIVERSITY



College of Education  
School of Occupational and Adult Education  
204 Willard Hall  
Stillwater, Oklahoma 74078-4045  
405-744-6275  
Fax 405-744-7758

Dear XXXX:

Date:

A few weeks ago you responded to a survey on interactive media use among Oklahoma City profit-oriented organizations. In the survey, you indicated your willingness to participate in a follow-up study. Thank you for your prompt response and willingness to participate in the follow-up study.

While the decision to include your organization was in part based on your organization's use of interactive multimedia, I want to inform you that the follow-up study is to gather in-depth descriptive information of how interactive multimedia is used within specific organizational context.

The interview will take about an hour to complete. While your participation is voluntary, it is crucial to the success of this study. I assure that all the information gathered is strictly confidential, and neither you nor your organization's name will be used without your consent.

I wish to ask your permission to audiotape or videotape the interview as to enable accurate reporting. If you wish to have the tape returned back after its use for analysis, I will be more than happy to do so.

Thank you for your time and kindest cooperation.

Sincerely,

Bede Anyanwu

APPENDIX K

INDIVIDUAL CASE STUDY INTERVIEWS

## Case Study Interview One

Contact Person: Mr. Travis P. Ratton  
 Title: Division Director  
 Organization: Kenrob and Associates, Inc.,  
 Type of Business: Systems Consulting  
 Address: 1300 S. Meridian Ave., OKC., OK  
 Location of Interview: 1300 S. Meridian Ave., OKC., OK  
 Date: June 10, 1996

## Questions

1. How is your organization using interactive multimedia for training?  
 a. for performance improvement

formal training     on the job training  
 retraining         education  
 cross training      job orientation  
 gaming              modeling  
 drill/practice     case studies  
 testing             information dissemination  
 other

- b. For performance support

job enrichment/refreshers     existing job  
 additional job     embedded training     tutorial  
 demonstration     simulation             other

2. How is training available using interactive multimedia?

- a. Training availability with interactive multimedia

on-demand/walk-in     sign-up/appointment  
 training assignment     employee own time  
 other

3. How is interactive multimedia available?

- a. Interactive multimedia availability

on-site (clients come to our training location)  
 off-site (training is off-site for clients)  
 outsource (clients outsource from us)  
 other



## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS ( ) job aid
- information stations (kiosks)
- networked (x) LAN ( ) WAN (x) WWW/Internet- (mailing and text editing and transfers only)
- other (Satellite)

## 5. Why is your organization using interactive multimedia?

- competition ( ) local ( ) global
- proactive (ahead of the competition)
- economical                       cost effective
- time savings                       business necessity
- employee driven                       customer driven
- technology driven                       in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"Interactive multimedia is going to be a very strong supportive medium." You need to have that as well as live instruction." "What we are finding as well as why we are doing this is that the universities are not training the subjects that we need to operate a viable employee to our advantage."

"I'm not finding students coming out of the universities trained in the relational databases." "Unless they have changed in the last 3-6 months." "But when we have been looking at them, we have not found that capability." "Unlike people, advanced older students that had already worked in industry and had gone back to school for masters degree or whatever or had gone back for bachelors, but had already had bunch of experience."

"Most of your 4th generation and leading edge technology is being taught by industry, and is not being taught by universities." "We feel that is something universities need to get on line with." "They need to know what industries needs are and start offering those courses."

"Too many times we've seen especially in the computer end that they are sticking to older technologies and not keeping pace with where the industry is going." "Consequently, we

cannot take graduates that are out of school and put them into these environments without having some types of training." "So, that forces us to not to accept these students that are out of school." "They need to go somewhere to be trained before they come to us." "When they get the baseline training, then we are able to take those that are capable and then make them better programmers and put them to use."

"It will be far better if the universities were at least teaching some of the latest concepts and getting into it with details, so that the people coming to us will have the baseline understanding of some of these concepts." "So, when we put them out with older people or seniors people that have experience, they can pick up on it." "So it is not difficult for them to immediately become productive."

## Case Study Interview Two

Contact Person: Mr. Dane Johnson, CPA, and Brian Estherwood  
 Title: Chief Financial Officer/Treasurer  
 Organization: Central Plastics Company  
 Type of Business: Manufacturing (designers/manufacturers)  
 Address: 1901 W. Independence, Shawnee, OK  
 Location of Interview: 1901 W. Independence, Shawnee, OK

Date: June 11, 1996

## Questions

## 1. How is your organization using interactive multimedia for training?

## a. For performance improvement

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> formal training | <input checked="" type="checkbox"/> on the job training       |
| <input checked="" type="checkbox"/> retraining      | <input checked="" type="checkbox"/> education                 |
| <input type="checkbox"/> cross training             | <input type="checkbox"/> job orientation                      |
| <input type="checkbox"/> gaming                     | <input type="checkbox"/> modeling                             |
| <input checked="" type="checkbox"/> drill/practice  | <input checked="" type="checkbox"/> case studies              |
| <input checked="" type="checkbox"/> testing         | <input checked="" type="checkbox"/> information dissemination |
| <input type="checkbox"/> other                      |   |

## b. For performance support

- |  |  |
|--|--|
| <input type="checkbox"/> job enrichment/refreshers | <input checked="" type="checkbox"/> existing job |
| <input type="checkbox"/> additional job            | <input type="checkbox"/> embedded training       |
| <input checked="" type="checkbox"/> tutorial       | <input type="checkbox"/> demonstration           |
| <input type="checkbox"/> simulation                | <input type="checkbox"/> other                   |

## 2. How is training available using interactive multimedia?

## a. Training availability with interactive multimedia

- |   |   |
|---|---|
| <input type="checkbox"/> on-demand/walk-in              | <input checked="" type="checkbox"/> sign-up/appointment |
| <input checked="" type="checkbox"/> training assignment | <input type="checkbox"/> employee own time              |
| <input type="checkbox"/> other                          |   |

## 3. How is interactive multimedia available?

## a. Interactive multimedia availability

- on-site  off-site  outsource  other

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS  job aid
- information stations (kiosks)
- networked  LAN  WAN  WWW/Internet- (mailing only)
- other

## 5. Why is your organization using interactive multimedia?

- competition  local  global
- proactive/edge (ahead of the competition)
- economical  cost effective
- time savings  business necessity
- employee driven  customer driven
- technology driven  in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

No comment.

## Case Study Interview Three

Contact Person: Mr. Don R. Lorg  
 Title: Sales Manager/Director of Associate Development  
 Organization: Alliance Real Estate  
 Type of Business: Real Estate Sales  
 Address: 1312 S. Morgan Road, Oklahoma City, OK  
 Location of Interview: 1312 S. Morgan Road, Oklahoma City, OK  
 Date: June 11, 1996

## Questions

1. How is your organization using interactive multimedia for training?

a. For performance improvement

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> formal training | <input checked="" type="checkbox"/> on the job training |
| <input type="checkbox"/> retraining                 | <input checked="" type="checkbox"/> education           |
| <input type="checkbox"/> cross training             | <input checked="" type="checkbox"/> job orientation     |
| <input type="checkbox"/> gaming                     | <input checked="" type="checkbox"/> modeling            |
| <input checked="" type="checkbox"/> drill/practice  | <input checked="" type="checkbox"/> case studies        |
| <input checked="" type="checkbox"/> testing         | <input type="checkbox"/> information dissemination      |
| <input type="checkbox"/> other                      |   |

b. For performance support

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> job enrichment/refresher | <input checked="" type="checkbox"/> existing job  |
| <input type="checkbox"/> additional job                      | <input type="checkbox"/> embedded training        |
| <input checked="" type="checkbox"/> tutorial                 | <input checked="" type="checkbox"/> demonstration |
| <input checked="" type="checkbox"/> simulation               | <input type="checkbox"/> other                    |

2. How is training available using interactive multimedia?

a. Training availability with interactive multimedia

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> on-demand/walk-in   | <input type="checkbox"/> sign-up/appointment          |
| <input checked="" type="checkbox"/> training assignment | <input checked="" type="checkbox"/> employee own time |
| <input checked="" type="checkbox"/> other               |   |

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS ( ) job aid
- information stations (kiosks)
- networked ( ) LAN (x) WAN (x) WWW/Internet
- other (x) Satellite

## 5. Why is your organization using interactive multimedia?

- competition (x) local ( ) global
- proactive/edge (ahead of the competition)
- economical                       cost effective
- time savings                       business necessity
- employee driven                       customer driven
- technology driven                       in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"In simulating situations both for management, sales people, and customers can alleviate fears of the unknown, whereby having access of the media and have a feel of the process especially new buyers." "It all boils down to money." "Customers want immediate gratification." "They want information now, not 2 or 3 days later." "They are constantly searching for information." "Therefore, we have to be prepared to give them right then with inventories everywhere."

"Now it takes 60 to 45 days to look for and close a home, we would want to do it in 2 to 3 days, even 3 seconds will be hilarious." "We want to be 2 to 3 years ahead of the competition." "We want to be at the leading edge of the competition." "We are the only company in Oklahoma for the past one and half years with the system where customers can dial in and qualify themselves, access and get information in 2 minutes unlike going through a magazine that may take hours to get the same information."

"We have a job to do." "To stay on top and ahead of the competition." "The way we do things now are different." "Customers can make a choice whether they would want to talk with an agent or not."

"This technology allows us to track on response rates of each property we have out there." "It allows us to determine how to invest, track the calls, and how many of those calls are transferred to the office." "It gives us the response rate of each property, which in turn, give us the information on how to invest and where not to invest."

Note: Some of the information furnished by Mr. Lorg is not in use by the organization at this point in time, but the organization is currently implementing the technology.

## Case Study Interview Four

Contact Person: Thomas A. Hill, III  
 Title: Director of Engineering  
 Organization: Kimray Inc.  
 Type of Business: Manufacturing (oil/gas equipment/control)  
 Address: 52 N.W. 42 OKC., OK  
 Location of Interview: 52 N.W. 42 OKC., OK  
 Date: June 12, 1996

## Questions

1. How is your organization using interactive multimedia for training?

a. For performance improvement

- |  |   |
|--|---|
| <input type="checkbox"/> formal training           | <input type="checkbox"/> on the job training                  |
| <input type="checkbox"/> retraining                | <input checked="" type="checkbox"/> education                 |
| <input type="checkbox"/> cross training            | <input type="checkbox"/> job orientation                      |
| <input type="checkbox"/> gaming                    | <input checked="" type="checkbox"/> modeling                  |
| <input checked="" type="checkbox"/> drill/practice | <input checked="" type="checkbox"/> case studies              |
| <input checked="" type="checkbox"/> testing        | <input checked="" type="checkbox"/> information dissemination |
| <input type="checkbox"/> other                     |   |

b. For performance support

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> job enrichment/refreshers | <input checked="" type="checkbox"/> existing job  |
| <input type="checkbox"/> additional job                       | <input type="checkbox"/> embedded training        |
| <input checked="" type="checkbox"/> tutorial                  | <input checked="" type="checkbox"/> demonstration |
| <input checked="" type="checkbox"/> simulation                | <input type="checkbox"/> other                    |

2. How is training available using interactive multimedia?

a. Training availability with interactive multimedia

- |  |  |
|--|--|
| <input type="checkbox"/> on-demand/walk-in   | <input type="checkbox"/> sign-up/appointment |
| <input type="checkbox"/> training assignment | <input type="checkbox"/> employee own time   |
| <input type="checkbox"/> other               |  |

3. How is interactive multimedia available?

a. Interactive multimedia availability

- on-site    off-site    outsource    other



## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS (x) job aid
- information stations (kiosks)
- networked ( ) LAN ( ) WAN (x) WWW/Internet
- other

## 5. Why is your organization using interactive multimedia?

- competition (x) local (x) global
- proactive/edge (ahead of the competition)
- economical  cost effective
- time savings  business necessity
- employee driven  customer driven
- technology driven  in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"We are using CD-ROM all over the world." "Our product line requires that our distributors know our product line." "In other to any product, our distributors have to know how it works, e.g. different pressure valves and configurations." "We do these by computer animations by putting all catalog information on a CD-ROM."

"We also use the Internet with our Web Site." "Our searchable databases are used by our distributors for training and information distribution." "We plan on using the Internet more and more." "However, Internet's use is limited." "It is too unorganized, too expensive, some of the information is erroneous, there is too much garbage, too much trash." "There is certain time of the day that the Internet is so slow that you cannot get in." "I not see it as the all and all of the library of information." "It is not a good advertisement tool." "We use it to tell people the type of business we are in, then, if they are interested they can contact us."

"Our goal is to have the catalog on CD-ROM and on the Internet." "Next step is to allow people to order through the Internet after they identify the product." "That is where we are headed." " "We have to limit what we send to the Web because of our competitors." "Though, we do not use the Internet for training."

## Case Study Interview Five

Contact Person: Gene Binning  
 Title: Manager of Marketing and Training  
 Organization: Governair Corporation  
 Type of Business: Manufacturing (air-conditioning equipment)  
 Address: 4841 N. Sewell, OKC., OK  
 Location of Interview: 4841 N. Sewell, OKC., OK  
 Date: June 12, 1996

## Questions

1. How is your organization using interactive multimedia for training?

a. For performance improvement

formal training     on the job training  
 retraining         education  
 cross training      job orientation  
 gaming              modeling  
 drill/practice      case studies  
 testing              information dissemination  
 other

b. For performance support

job enrichment/refreshers     existing job  
 additional job     embedded training     tutorial  
 demonstration     simulation             other

2. How is training available using interactive multimedia?

a. Training availability with interactive multimedia

on-demand/walk-in         sign-up/appointment  
 training assignment      employee own time  
 other

3. How is interactive multimedia available?

a. Interactive multimedia availability

on-site     off-site     outsource     other

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS ( ) job aid
- information stations (kiosks)
- networked ( ) LAN ( ) WAN (x) WWW/Internet
- other

## 5. Why is your organization using interactive multimedia?

- competition ( ) local ( ) global
- proactive/edge (ahead of the competition)
- economical  cost effective
- time savings  business necessity
- employee driven  customer driven
- technology driven  in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"We use the Internet for E-mailing only, and not for training." "The use of the technology makes the presentation a little bit different." "It makes it smoother or more sophisticated."

## Case Study Interview Six

Contact Person: Mr. Steve Miller  
 Title: Technical Service Manager  
 Organization: Dub Richardson Ford  
 Type of Business: Retail Auto sales  
 Address: 3815 N. May OKC., OK  
 Location of Interview: 3815 N. May OKC., OK  
 Date: June 12, 1996

## Questions

1. How is your organization using interactive multimedia for training?

a. For performance improvement

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> formal training | <input checked="" type="checkbox"/> on the job training       |
| <input type="checkbox"/> retraining                 | <input checked="" type="checkbox"/> education                 |
| <input checked="" type="checkbox"/> cross training  | <input type="checkbox"/> job orientation                      |
| <input type="checkbox"/> gaming                     | <input type="checkbox"/> modeling                             |
| <input checked="" type="checkbox"/> drill/practice  | <input checked="" type="checkbox"/> case studies              |
| <input checked="" type="checkbox"/> testing         | <input checked="" type="checkbox"/> information dissemination |
| <input type="checkbox"/> other                      |   |

b. For performance support

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> job enrichment/refreshers | <input checked="" type="checkbox"/> existing job |
| <input checked="" type="checkbox"/> additional job            | <input type="checkbox"/> embedded training       |
| <input checked="" type="checkbox"/> tutorial                  | <input type="checkbox"/> demonstration           |
| <input checked="" type="checkbox"/> simulation                | <input type="checkbox"/> other                   |

2. How is training available using interactive multimedia?

a. Training availability with interactive multimedia

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> on-demand/walk-in   | <input checked="" type="checkbox"/> sign-up/appointment |
| <input checked="" type="checkbox"/> training assignment | <input checked="" type="checkbox"/> employee own time   |
| <input type="checkbox"/> other                          |   |

3. How is interactive multimedia available?

a. Interactive multimedia availability

- on-site  off-site  outsource  other

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

- stand alone/portable workbench
- EPSS (x) job aid
- information stations (kiosks)
- networked ( ) LAN (x) WAN ( ) WWW/Internet)
- other (x) Satellite (FORD STAR) from Ford Motor Company in Dearborn, Michigan

## 5. Why is your organization using interactive multimedia?

- competition (x) local ( ) global
- proactive/edge (ahead of the competition)
- economical                       cost effective
- time savings                       business necessity
- employee driven                   customer driven
- technology driven               in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"I am excited about the technology." "The service department was the first to use it." "It was exciting to see employees being excited about it." "To have interactive learning center is exciting." "It is an exciting area as we go ahead in the year 2000." "It is exciting, I won't mind wearing it out."

## Case Study Interview Seven

Contact Person: Mr. Russ Cooper  
 Title: Sr. Project Leader  
 Organization: Altec Lansing (Mark IV Audio, Inc.)  
 Type of Business: Manufacturing (professional audio equipment)  
 Address: 10500 West Reno Ave., OKC., OK  
 Location of Interview: 10500 West Reno Ave., OKC., OK  
 Date: June 13, 1996

## Questions

1. How is your organization using interactive multimedia for training? a. For performance improvement

formal training     on the job training  
 retraining         education  
 cross training     job orientation  
 gaming             modeling  
 drill/practice     case studies  
 testing             information dissemination  
 other

- b. For performance support

job enrichment/refreshers     existing job  
 additional job     embedded training     tutorial     demonstration  
 simulation         other

2. How is training available using interactive multimedia?

- a. Training availability with interactive multimedia

on-demand/walk-in     sign-up/appointment  
 training assignment     employee own time  
 other

3. How is interactive multimedia available?

- a. Interactive multimedia availability

on-site     off-site     outsource     other

## 3. How is interactive multimedia available?

## a. Interactive multimedia availability

on-site     off-site     outsource     other

## 4. How is interactive multimedia accessible

## a. Interactive multimedia accessibility

stand alone/portable workbench  
 EPSS (x) job aid  
 information stations (kiosks)  
 networked (x) LAN ( ) WAN (x) WWW/Internet  
 other

## 5. Why is your organization using interactive multimedia?

competition ( ) local ( ) global  
 proactive (ahead of the competition)  
 economical                       cost effective  
 time savings                       business necessity  
 employee driven                       customer driven  
 technology driven                       in vogue

## 6. Is there any other information you would like to share regarding how your organization is using interactive multimedia?

"I would like to see more interactive multimedia for training." "I would like to see long distance learning more prevalent."

APPENDIX L

VERBATIM RESPONSES OF EVALUATION AND  
MEASUREMENT OF INTERACTIVE  
MEDIA EFFECTIVENESS



VERBATIM RESPONSES OF EVALUATION AND MEASUREMENT  
OF INTERACTIVE MEDIA EFFECTIVENESS

---

1. Through improvements in productivity, quality, service levels. Through surveys of customers (internal and external). Growth of business, decreased cost, etc.
2. The response from franchisees on several test groups was very good.
3. Research the vendors and/or software products on the market to match up to the business requirements and needs for the best match.
4. Pre and post tests provided by system and recorded in database.
5. Have used for over a year but have not evaluated it at this time.
6. The single user at the present is engaged in a search for appropriate material for our company.
7. No effort to measure.
8. Industry conferences.
9. Presently through magazine reviews and other companies experience.
10. Done with training.
11. Systems dept. is responsible for PC workstation training. We have used CD's to provide flexible schedule training (we work 3 shift operation). We have found that interactive CD's are good for those who are self motivated to learn the desired subject. A great majority need the discipline class instruction provides.
12. Weekly videos.
13. The greatest tool used for evaluation is the "bottom line." How does this affect the profit potential of the company (i.e. by enhancing sales staff ability and accounting/reporting efficiencies.
14. Done corporately. Don't do at the store level.
15. Training dept. Users.
16. We determine need and then we determine the most cost effective method to deliver info to clients. If the format is IMM them we insure it is compatible with our network.

17. Have audience complete course evaluation.
  18. Marketing.
  19. Comparisons are utilized against traditional methods of accomplishing result.
  20. Feedback forms and evaluations required after training sessions. Summaries compiled and forwarded to appropriate persons.
  21. We definitely see the benefits and hope to get more involved in CD Authoring of interactive catalogs and presentations.
  22. Small team reviews--Reports to management.
  23. Just getting started and have little experience base.
  24. Sales representative training for equipment selection and pricing. Service training.
  25. How it will directly effect the manufacturing process or aid in production/administration.
  26. We only use interactive at this time to train our route drivers.
  27. By the number of amounts completing the monthly training.
  28. Methods of measurement depends on where such media is being used--training classes, manufacturing processes, product design, etc.
  29. Factory support of the training equipment has been a big asset for the dealer usually, will not have the equip or availability to have such methods.
  30. We are still investigating its use in our system. Customer/user friendly features, content and cost will be considered in evaluating its application in our system.
  31. Base on need. Base on improved employee skills.
  32. Review of various vendors and presentations.
  33. Not applicable/never used (45 responses).
-

APPENDIX M

VERBATIM RESPONSES ON THE DIRECTION OF  
IM IN THE NEXT THREE TO FIVE YEARS

VERBATIM RESPONSES ON THE DIRECTION OF IM IN THE  
NEXT THREE TO FIVE YEARS

---

1. I guess I need a definition of "interactive" media; We are going to use self directed computer systems for orientation, training (process) and safety awareness needs.
2. More utilization-introduction to levels outside of sales area. Specific training to certain positions, departments, etc. spread out across the nation.
3. Don't know
4. I see the President of our hotel brands using this to communicate to the franchisees. We have over 5,000 hotel franchisees.
5. Dependent on corporate training department.
6. Hopefully, a network of systems within the hospital.
7. The organization will migrate thru a windows based training system designed by module, then will incorporate "INTRANET" design concepts and tools.
8. Safety training. Job instruction training for production jobs.
9. We may use it in training.
10. Not sure. We may make greater use of multimedia CBT technology as this seems to have greater potential and lowest implementation cost in terms of creating a training (centralized) center. Decentralized applications may be considered in future as we begin to see reductions from communication service providers and technologies that increase the throughput.
11. Training: product knowledge and job training/customer product education.
12. If used will be via outside source.
13. Exploring options.
14. Have not explored the process.
15. CD-ROM industry manuals and laws. Training classes from outside vendors.
16. Should start to move in that direction.
17. Performing more in-house training with interactive media.

18. Currently developing WWW site. Plan to "publish" interactive CD-ROM within the next 2 years.
19. Unable to comment at this time. Our company will however use the most current training tools available. With more exposure to interactive media implementation will be certain.
20. I believe that all companies are going to be heavily involved.
21. More training.
22. We will be using it to supplement instructor training. Since we do not test our employees after taking a course - we prefer instructors to insure maximum exposure. Quality of media is not the issue - motivation to learn is the problem with a passive system like CD's.
23. Potential applications in manufacturing in machine setup training.
24. Training, conference calls, on all line of communication.
25. Use of two way video.
26. More involvement with continued computer technology growth. Learning how to sell the product without "seeing" the customer.
27. We will do all our buying and many of our meeting by the use of interactive media.
28. Training off-site employees.
29. Utilizing video conference for at least 50% of current training sessions and meetings.
30. Increasing.
31. Greatly expanding our use.
32. Not sure on a local basis. Our worldwide organization develops and tests and is rolled out to local offices.
33. Plan to explore possibilities in 1997.
34. our field sales force will be tied to close to telemarketing and customers.
35. CD authoring, web site.

36. Our need for interactive communications will be in conferencing and data gathering.
37. Primarily looking for improvement in user training on products for application, service and troubleshooting.
38. See our training having done some by simulation and interactively in the next 5 years.
39. Employee directed development. This will allow employees to access their own strengths and areas of improvement, gauge performance against company standards, understand career paths, gain knowledge about current and future demands on skills.
40. Into investigation and evaluation stages.
41. Good possibility of use.
42. Possibly having an interactive catalog--customer orders directly through this interactive media without the aid of salesperson. Interactive media could also aid in the training of personnel on complicated equipment.
43. Might be useful in training for proper lifting and/or positioning techniques. But with the on-going changes in the health care industry, the difference in individual needs and techniques, I do not see many uses in the health care field.
44. Marginal, not important.
45. There will be much more emphasis.
46. Strong push toward due to cost effectiveness.
47. Greater use in training employees.
48. This is something we would have an interest in but we aren't sure how it could be used.
49. As the sophistication of electronics and procedures become better, the deeper we will be also.
50. Next 3-5 years. Currently not utilized.
51. Currently have no plans to implement.
52. Expanded use in training applications.
53. To the CD ROM base and on the IntraNet based training delivery.

APPENDIX N

VERBATIM RESPONSES ON TRENDS COMING  
IN THE AREA OF INTERACTIVE MEDIA

VERBATIM RESPONSES ON TRENDS COMING IN THE AREA  
OF INTERACTIVE MEDIA VERBATIM RESPONSES

---

1. Toward the emulation of current Web Page Concepts on the Internet.
2. Being able to develop short training programs and sending them to the field workforce.
3. Perhaps greater utilization of full motion video or teleconferencing as they become more cost effective.
4. Use of Internet for product distribution.
5. Growth.
6. It will be more readily available and more widely used.
7. Interactive WWW sites will become prominent (and dominate) within the next 5 years.
8. This will be an excellent source of training for students needing supplemental help and for those who prefer to learn a subject on their own. In other words, those at both ends of the curve-the majority will prefer human interaction.
9. More involvement with interactive computer technology (i.e., the Internet). Sales force will need to be computer literate in order to sell to customers via the Internet and not face-to-face.
10. Becoming more personal.
11. One-on-one training sessions.
12. More user friendly.
13. Self directed training.
14. Process flow communication along the supply chain both internally and externally.
15. Interactive headsets for virtual real interactivity. The workplace will become a more fun place and will require more individual input than ever before permitted by traditional management. I see this as a confidence builder.
16. Sales people will be able to simulate real life situations and practice their skills on something besides a live customer. Could be used in preparation for appointment, and other ways.



17. Hidebound training departments won't survive when traditional training companies transform themselves into Virtual Organizations. Virtual Training. Internet Training.
  18. Quick, upward trends towards total interactive media especially digital interactive video.
  19. Lower cost training for advanced development skills.
  20. A trend towards using interactive media as a training method, for sales and service. Possibly a trend for National/video centers around the USA and the world, for interactive customer selling seminars.
  21. Using as a means for "interactive" catalog.
  22. I think the entertainment industry will be the first to capitalize on this new media.
  23. More emphasis.
  24. Not well enough informed to comment.
  25. Rapid expansion of project use!
  26. The shift from classroom/CD ROM based training to INTRANET base of training.
-

APPENDIX O  
INSTITUTIONAL REVIEW BOARD (IRB)  
APPROVAL FORM

OKLAHOMA STATE UNIVERSITY  
INSTITUTIONAL REVIEW BOARD  
HUMAN SUBJECTS REVIEW

Date: 04-24-96

IRB#: ED-96-118

**Proposal Title:** INTERACTIVE MULTIMEDIA USE FOR TRAINING IN  
SELECTED OKLAHOMA CITY BUSINESSES: A SURVEY AND CASE STUDIES

**Principal Investigator(s):** Cathy Sleezer, Bede Anyanwu

**Reviewed and Processed as:** Exempt

**Approval Status Recommended by Reviewer(s):** Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD  
AT NEXT MEETING.

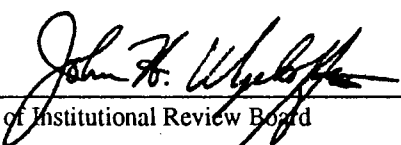
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A  
CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD  
APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR  
APPROVAL.

---

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval  
are as follows:

Signature:

  
\_\_\_\_\_  
Chair of Institutional Review Board

Date: April 30, 1996

VITA

Bede Olewuike Martins Anyanwu

Candidate for the Degree of

Doctor of Education

Thesis: INTERACTIVE MULTIMEDIA USE FOR TRAINING IN SELECTED  
OKLAHOMA CITY BUSINESSES: A SURVEY AND CASE STUDIES

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born at Enugu, Nigeria, the son of Mr. Francis Amanze and  
Francisca Anukem Anyanwu.

Education: Graduated from National Secondary School, Nike, Enugu Nigeria in  
May 1978; obtained high school diploma in May, 1978, received Bachelor of  
Arts degree from Central State University, Edmond, Oklahoma in December,  
1988; received Master of Arts degree from Central State University, Edmond,  
Oklahoma in May 1991; completed requirements for the Doctor of Education  
degree with major in Occupational and Adult Education (specialization in  
Human Resource Development) at Oklahoma State University, December,  
1996.

Professional Experience: Supervisor and Purchase Officer, Oskate Building and  
Electrical Engineers, Onitsha, Nigeria, 1978 to December, 1980; Manager,  
Roberts Printers, Onitsha, Nigeria, 1981 to December, 1981; Manager,  
Transglobe Shipping and Freight Forward, Port Harcourt, Nigeria, 1981 to  
January, 1985; Case Manager Intern, Basset Correction Center, Oklahoma  
City, Oklahoma, 1988 to December, 1988; Intake Supervisor Intern,  
Oklahoma County Public Defender, Oklahoma City, Oklahoma, 1990 to  
December, 1990; Service Supervisor, Urban Management Inc., Edmond,  
Oklahoma, 1987 to May, 1995; Member, Board of Directors, Franko Franka  
Ltd., Onitsha, Nigeria June, 1988 to present; Oklahoma State Certified  
Substitute Secondary School Teacher, May, 1995 to present.