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UMI
MULTIMEDIA PRESENTATION SOFTWARE USAGE IN THE DELIVERY OF EDUCATION AND TRAINING TO ADULT LEARNERS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

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* * * * *

The Ohio State University
1999

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ABSTRACT

Multimedia presentation software may be used to enrich the teaching/learning processes, to introduce students to technology thought to be prevalent in the workplace, and to engender a new approach and attitude among students and workers which would potentially make them responsible and autonomous learners. This is in contrast to workers or learners who want to simply be seekers of traditional knowledge from lecturers and mentors (Wellington, 1995).

Challenges for educators and trainers who use multimedia presentation software include: (1) interweaving technology more efficiently within adult learning processes so that understanding is maximized and (2) enriching training and educational programs by developing autonomous learners. The potential for increased usage and improving the teaching/learning processes would be greater if more was known about (1) what types of multimedia presentation software are being used, (2) the purpose for which the software is being used, (3) the frequency of such usage, and (4) the barriers encountered as the software is used to deliver education or training to adult learners. For the purpose of this study an adult learner is defined as an individual who is either 1) participating in post-secondary education at a college or university to gain knowledge or skills, or 2) participating in formal training for the purpose of improving performance on a job currently held.
In this study, data were gathered and analyzed from three selected learning environments and then used to identify multimedia presentation software usage in terms of type, purpose used, frequency of use, and barriers encountered. Relationships between software users and some of their demographic characteristics were also identified and described. Ninety-six full-time faculty members returned questionnaires sent to them regarding their use of multimedia presentation software. All faculty surveyed teach or train in the areas of business or education at Cedarville College, Cedarville, Ohio; Central State University, Wilberforce, Ohio; and Wright State University, Fairborn, Ohio.

The study results suggest that educators/trainers who teach full-time at the institutions in this study are using multimedia presentation software since 75% (n = 72) of the respondents indicated usage. The range for the overall level of usage was “rarely ever” to “frequent”. Some of the educators/trainers who do not currently use the software, indicated that they want to use the software, but the non-availability of resources prevents such usage. *Microsoft PowerPoint* was reported to be the most commonly used package. Future studies need to explore how multimedia presentation software usage (1) enriches the teaching-learning processes and (2) contributes to autonomous student learning. These findings further suggest that perhaps more attention needs to be given to training educators and trainers on using multimedia presentation software in faculty development and training sessions.
Dedicated to my husband, Robert;
to our children, Vickie, Carole, and Tony;
and to
Reva Marie, Deidra Renee, Antony Robert,
Emmett IV, and Kelsi Brownell
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FIELDS OF STUDY

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Problem Background

The nature and work of organizations in both business and academic settings have greatly changed during the 1990s and continue to change as the decade and century draw to a close. Many of the changes occurring in business and industry were driven by large-scale, company downsizing and a shift from an industrial-based economy to an information-based economy (Senge, 1990). Academia also experienced restructuring and re-organizational changes which resulted in downsizing and a heavier focus on the use of technology in learning situations (Reinhardt, 1995).

The distinctive nature of adults influences the approach to learning that takes place in a business or industry setting. This influence can also be found in adult learning academic settings (Richey, 1992). One form of adult learning that occurs in a business and industry setting is known as training. Training provides opportunities which support the transfer of knowledge from one setting to another, emphasizes unique motives for training participation, encourages trainee involvement in the specific tasks being learned, and provides an immediate opportunity for applying the newly gained knowledge, skills, and attitudes (KSAs). In order to make workers more viable in today’s workforce, it is essential that some type of effective training take place (Wislock, 1993).
In contrast to training, education is obtained in an academic setting. Although education can also be preparatory, it is thought to promote a more general transfer of KSAs since learning is not specifically intended for immediate use in a specific situation. Nevertheless, education and training often overlap. An important principle of adult education is the belief that adults maintain their ability to learn throughout the life span. This belief also serves as a foundation for employee training because it recognizes the value of content-specific experience and expertise as a facilitator of new learning and new KSAs (Richey, 1992). Since today's employers are expecting employees to have different KSAs than those emphasized earlier in the twentieth century, different strategies to meet these expectations and needs are being developed. Both trainers in the business world and educators in academia are attempting to meet these expectations by linking learning more closely to productivity rather than linking learning to training in advance of the task being learned (Reinhardt, 1995; Wilder, Caldwell & Garvey, 1998). This strategy results in a new focus on increasing individual performance. As a result of this new focus, those who deliver education or training to adult learners are required to be better trained in the use of technology (Howard, 1995; Senge, 1990; Terez, 1990; Reinhardt, 1995). Both business and academia are responding to employer needs by taking advantage of technologies, such as multimedia presentation software, in an attempt to increase learning and individual performance in adults (Barley, 1992).

Individual performance is enhanced through the acquisition of increased knowledge, skills, and competencies (Gilley & Eggland, 1989). Using multimedia presentation software can assist in achieving this enhancement (Dahmer, 1993).
Multimedia presentation software can be used to increase KSAs, enhance individual performance, and provide a multisensory approach to education, training, and learning (Wislock, 1993). This is because multimedia presentation software has the potential for appealing to all senses and several perceptual modalities. Multiple perceptual modalities are maximized when multimedia presentation software is used as a means for reaching many different types of learners. Increased coverage enables the quality of the instructional learning process to be more effective (Laurillard, 1993). The use of multimedia presentation software, by a skilled trainer/educator, will enhance learning. When adult learners are encouraged to use their dominant perceptual learning modality, they tend to be more successful in learning endeavors, whether in a training room within a business setting, a classroom within an educational institution, or in self-directed inquiry (Wellington, 1995). Thus, one potential for greater success in learning is an impetus for increased usage of multimedia presentation software in training and academic environments.

When opportunities for learning are offered at the moment learning is necessary and increased productivity can be measured, then the situation may be identified as "just-in-time" learning (Johansen & Swigart, 1994). One specific technology available to facilitate "just-in-time" learning is computer-based learning (CBL), also known as computer assisted instruction (CAI), which uses multimedia. Multimedia may be a computerized tool that can provide innovative ways, depending on the user's imagination, for sharing information and motivating learners (Holsinger, 1994). Multimedia can make learning more effective when educating adult learners because it has the potential to
involve all the senses by using combinations of video, sound, touch, graphics, aroma, and computer animation (Keyes, 1994; Lewis, 1997. Multimedia presentation software programs further allow the user to interact with media involving print, color, and photographic slides (Cabeceiras, 1991). Trainers and educators are attempting to increase learning and improve understanding in adult learning environments by using multimedia programs in these ways. Multimedia presentation software is simply one component of multimedia that allows the educator or trainer to appeal to several perceptual modalities (Wislock, 1993).

Multimedia software programs are not always defined in the same way, but the components are similarly defined. The definition of multimedia has evolved from an assortment of connected audiovisual tools to the way computers are presently used to combine video, audio, graphics, and text in a multilevel, computer-based production that can be experienced interactively (Badgett & Sandler, 1994). A multimedia software program is a segment of multimedia that is being used by educators and trainers to help adults learn.

Four qualifiers are essential when defining what constitutes a multimedia software program. First, a computer must be used to coordinate what is seen and heard to provide a means for interaction. Second, links must be present to connect the information. Third, navigational tools must be present. Fourth, ways to gather, process, and communicate one's own information and ideas must exist (Hofstetter, 1995). Hofstetter argues that if one of these four components is missing, then a multimedia software program does not exist.
Multimedia software presentations:

a) can access information from a laser disc, CD-ROM disc, or a computer program,
b) allow the user to orchestrate a multitude of media forms,
c) reduce a meeting’s time by 40%,
d) increase audience retention of information by as much as 38%, and
e) increase understanding by students or employees (Keyes, 1994).

Multimedia technology may be used to enrich training and educational programs, to introduce students to the technology thought to be prevalent in future work, and to engender a new approach and attitude among students and workers which would make them responsible and autonomous learners rather than seekers of traditional knowledge from lecturers and mentors (Wellington, 1995). The challenge for educators and trainers is to interweave technology more efficiently within adult learning processes so that understanding is maximized. Since educators are generally interested in maximizing understanding, multimedia presentation software is emerging as a key tool for interweaving technology into adult learning processes. Many experts believe the use of multimedia presentation software in the delivery of training and education will continue to increase (Morgan, Ponticell, & Gordon, 1998). Thus, multimedia presentation software programs will play an important role in addressing the training and educational challenges for the next decade and the approaching new millennium.

When the material being taught is segmented into easy-to-digest modules, it is known as modularizing the subject matter. Subject matter modularization can be useful in addressing challenges that emerge when using computer-based-training (CBT), which is
also increasing in popularity (Shank, Korcuska, & Jona, 1995). The instruction is easier to modify and keep current with the state-of-the-art when only sections/modules require updating instead of the entire package. Modules are also more easily adapted to the rapid technological changes inherent in technology when more than one subject unit is included and identified in modular form.

Modules developed with multimedia can be used with or without an instructor. Advantages for using CBT with an instructor include: (a) a personal touch is provided, (b) questions and concerns not covered in the CBT modules can be addressed, and (c) educational and training materials can be customized. Advantages for using CBT without an instructor include: (a) instruction costs less, (b) the same amount of training is achieved in less time, and (c) the quality of the training is about the same as when instructor-led (Shank et al, 1995).

Multimedia software modules are frequently used to provide training to new employees about segments of the operations of the organization. When the modules are designed for use without an instructor, a disadvantage is that development costs are high when compared to low-tech traditional education and training delivery approaches. However, the costs may be offset because modules are less expensive to deliver due to a reduction in training time, instructor development time, and the cost avoidance of potential travel expenses of the trainer/instructor. A resulting positive return on investment will be realized when using multimedia modules without an instructor if the population in need of the training is large enough to outweigh the cost of the development of the multimedia modules (Shank et al, 1995).
Astonishing multimedia technological advancements have been made during the twentieth century with respect to delivering training and education to adult learners. Multimedia presentation software is already being used to train trainers and educators about technology, to improve the delivery of current training and educational programs, and to restructure training and/or educational programs (Bright & Waxman, 1993; Lewis, 1997). Yet, as the twentieth century draws to a close, some suggest that multimedia technology will change the work of educators and trainers even more profoundly during the next decade (Kerka, 1994). Learning is expected to be further improved, information access is expected to continue to increase, more money is expected to be saved, and individual performance is expected to be further enhanced when multimedia presentation software is used (Reinhardt, 1995).

Problem Statement

Educators and trainers are continually challenged to find more effective ways to increase learning and enhance the individual performance of adult learners. Individual performance is enhanced through the acquisition of increased knowledge, skills, competencies, and/or behavior (Gilley & Eggland, 1989). More powerful tools, such as multimedia presentation software, are available to assist in this regard. Although research on multimedia presentation software has indicated that, when used, there is great potential for increasing learning, this potential has not been fully realized (Reinhardt, 1995).

Increased learning often does not take place because trainers, educators, and adult learners tend to shy away from using the unfamiliar (Desmond, 1999). Therefore, many educations and trainers continue to be primary users of conventional delivery systems even
though they have been introduced to methods for integrating multimedia presentation software into their instruction. There is a lack of evidence in the literature that demonstrates why educators and trainers are reluctant to use multimedia presentation software over traditional delivery systems (Reinhardt, 1995). More investigation is needed to determine the extent to which educators and trainers are using multimedia presentation software to facilitate the delivery of education and/or training to adult learners and to also identify barriers encountered in the process.

**Purpose of Study**

Increased use of multimedia presentation software by educators and trainers has prompted a need to determine to what extent multimedia presentation software packages are being used to educate and train adult learners. Also, problems encountered when using the software in educational and training environments need to be more fully documented. The purpose of this study was to describe the level of use for selected types of multimedia presentation software among educators and trainers who deliver education and training to adult learners in selected environments. The study also investigated a) whether or not relationships existed between the extent of multimedia presentation software usage and the level of formal training on the software received by educators and trainers and b) the number of years of experience the educators and trainers have in using multimedia presentation software, and other selected demographic characteristics such as age, area of employment, and position title of the educators/trainers.
Research Questions

The research problem was addressed by answering the following questions:

1. For what purpose and frequency is multimedia presentation software (MPS) being used in the delivery of education or training to adults?

2. What level and types of selected MPS are being used to deliver education/training to adults?

3. How did the educator/trainer learn to use MPS?

4. How valuable is the use of MPS when delivering education/training to adult learners, as perceived by adult educators/trainers?

5. What barriers/problems are encountered by educators and trainers when using MPS?

6. What are the demographic characteristics of the adult educator/trainer in terms of (a) highest degree earned, (b) the year degree was earned, (c) the year of participation in a formal training course to learn how to use MPS, (d) whether employer paid for the training, (e) whether educator/trainer uses the software for which he/she was trained, (f) gender, (g) age, (h) position title, (I) number of years educator/trainer has teaching at a university/college, (j) number of years educator/trainer has conducted training sessions in a business/industry setting, and (k) number of years of experience educator/trainer has using MPS?

7. Is there a relationship between the studied demographic characteristics of the adult educators/trainers and the frequency of use of selected MPS packages?
Significance of Study

This study contributed to practice in the field of workforce education and lifelong learning in several ways. The study determined the extent multimedia presentation software was being used by educators/trainers. The study also determined which of the selected types of multimedia presentation software was used most frequently in educational or training environments. The study provided input from educators and trainers regarding their general usage of selected multimedia presentation software. This input may be helpful to other educators and trainers who aspire to use multimedia presentation software to appeal to the adult learner's individual learning style. The identified barriers to the use of multimedia presentation software could help trainers and educators become more aware of potential stumbling blocks.

The demographic characteristics information of the survey participants provided information which may contribute to a better understanding of the characterization of educators and trainers who actually use multimedia presentation software to deliver education and training to adult learners. These analyses could be useful to faculty development specialists/planners in understanding the extent multimedia presentation software is being used in the selected educational environments being studied and surveyed and in better meeting the needs of the faculty they serve.

Limitations

Limitations that impacted the findings and conclusions of this study included:

1. The study was based on responses from a census survey taken from three educational institutions located in south-western Ohio; only full-time faculty within the
departments or colleges of business and education were asked to participate in the study. The disciplines of business and education were selected for study because both areas have educators and trainers who use multimedia presentation software to prepare adult learners for the workforce or classroom in some manner.

2. Unbiased responses to the survey questions was based on the respondent’s ability to interpret the questions asked and to provide fair and accurate responses.

3. The study was limited to participation by all full-time faculty members employed during the 1998-99 academic year in the selected areas of the survey population.

**Definition of Terms**

**Adult Learner**

**Constitutive:**

The *Webster’s Third New International Dictionary* (Gove, 1989), describes an adult as a person who has arrived at the age of maturity in physical and mental capacity; a person grown to full size and strength. Learner is defined as a person who is gaining knowledge or skills. Therefore, an adult learner can be defined as a full-grown person who accepts responsibility for his or her actions and is specifically involved in gaining a knowledge or skill (learning).

**Operational:**

For the purpose of this study, adult learners are defined as college/university professors (as in train-the-trainer), university students, or university employees in educational settings or trainees/employees in a business-industry setting.
Adult Educators and Trainers

Constitutive:

Educators are professional practitioners who deliver education which prepares individuals for possible future job requirements or for the realization of career paths (Reynolds, 1993). Trainers are human resource development practitioners who are responsible for providing the instructional process to help individuals improve performance on their present jobs through organized learning objectives (Reynolds, 1993).

Operational:

For the purpose of this study, educators and trainers are full-time faculty members who are employed in the departments/colleges of business or education at three educational institutions in south-western Ohio. There are 160 full-time faculty members included in the survey population.

Formal Training on Multimedia Presentation Software

Constitutive:

Formal is defined as in a prescribed manner according to set customs or rules; very regular and orderly. It is the opposite of informal which is done in a casual, relaxed manner not according to prescribed rules (Barnhart & Barnhart, 1989). Gilley & Eggland (1989) describe training as the learning that is provided in order to improve performance on the present job. Therefore, formal training can be described as that learning which is provided in accordance with set rules in a prescribed manner for the purpose of improving performance on the present job.
Operational:
For the purpose of this study, formal training on multimedia presentation software is defined as that training educators and trainers received in a structured training environment such as a course which occurs over a specific period of time with specific objectives which must be met for satisfactory course completion. The most recent year of participation in a formal training course to learn how to use multimedia presentation software will be indicated via mean scores.

Purpose and Frequency of Use of selected Multimedia Presentation Software

Constitutive:
Multimedia presentation software type refers to the various designations of computer software which include a combination of different information media, such as film, video, music, photos, and text in a single output to be used in making presentations and presenting instructional materials (Sleurink, 1995).

Operational:
For the purpose of this study, full-time faculty in departments/colleges of education and business are asked to indicate the frequency of use of multimedia presentation software programs to conduct training; to deliver education; to assist in the development of instruction; to generate on-line, web-based, independent learning assignments for adult learners; and to assist in the development of professional articles on using multimedia by circling 0 through 4. A five-point Likert-type scale will reflect usage indicated by a '0' for never used, '1' for rarely used, '2' for occasionally used, '3' for frequently used, and '4' for very frequently used.
**Multimedia Presentation Software**

Constitutive:

Multimedia presentation software refers to computer software used to make presentations and includes a combination of many different information display media in a single output. Specialized hardware and software are used to provide the display (Sleurink, 1995).

Operational:

For the purpose of this study, multimedia presentation software is defined as the combination of text, sound, video, graphics, and animation for use in computer-based training and in making presentations. College/university professors are asked the purpose for which they use multimedia presentation software and how frequently they use Astound®, Authorware Professional®, Dreamweaver®, Flash®, Lotus Learning Space®, Microsoft Power Point®, Podium®, Quest®, Quicktime®, Real Media®, Shockwave®, Toolbook®, Topclass®, Web CT®, or some other multimedia presentation software. A five-point Likert-type scale will reflect usage indicated by a '0' for never used, '1' for rarely used, '2' for occasionally used, '3' for frequently used, and '4' for very frequently used.
CHAPTER 2
REVIEW OF LITERATURE

Introduction

Careful integration of multimedia technology into learning environments is becoming increasingly more important. As trainers and educators step up to the challenge of meeting the needs of the adult learner in the 21st century, current methods for delivering training and education to adults must be reexamined. Ways to more effectively integrate multimedia usage must be found. Multimedia is at term being used to describe something, especially computer software, that combines the capabilities of technologies that formerly were separate. The multimedia approach is the correlated use of more than one type of instructional medium as a vehicle for presenting the instructional materials (Reynolds, 1993). Multimedia can combine such things as text, graphics, sounds, and still or motion pictures in a smooth way while presenting training, information, and educational sessions (Dahmer, 1993). Many considerations relating to the use of multimedia need to be made by the individual who delivers training and/or education to adult learners.

Individuals interested in teaching and learning must grasp opportunities to influence the design of new technology systems to work for learners, rather than to require learners to adapt to the requirements of technology (Gooler, 1987). Thus, meeting the needs of individuals continues to be a tenet of education and training for adult learners in
spite of the many rapid technological advances being made (Lewis, 1989). Other issues that emerge include keeping adult learners central to the learning process as multimedia becomes more widely used in the delivery of education and training; developing new models for learning that incorporate multimedia; identifying the tasks and competencies perceived to be important to those who use multimedia to deliver training and education to adults; and assessing the identified tasks to determine their perceived learning difficulty. An understanding of adult learning processes which encompass activities that the learners must perform in order to reach the stated learning objectives of the education or training episode is also needed.

Strong evidence exists within the literature that supports the need for adult learners to have subjective access to educational and training opportunities, whether they are in search of basic literacy and coping skills, personal enrichment, occupational improvement, or formal education. This access includes opportunities provided with the use of mixed models called multimedia. What is impressive about multimedia, when available, is that adult learners can learn at times and in places that suit their convenience. The technologies can be made interactive and allow distance learners to interact with instructors and fellow students as if they were actually sitting in the classroom together (Zigerell, 1984) or this technology can be accessed in an actual classroom or training room. Therefore, it is clear that some adult learners can benefit greatly from multimedia technology as a tool to facilitate their learning.

Adult education is often thought to be different from other forms of education because of the nature of its students (Jarvis, 1983). Adult educators have attempted to
define this difference for decades. As a result, andragogy, a major ideological model relating to the art and science of helping adults learn, has emerged to distinguish what is unique about adult learning when compared to pedagogy (Merriam, 1993). In spite of the development of andragogy and other adult learning theories and models, there is nearly as much controversy still existing today regarding whether significant differences actually exist between learning in adulthood and learning prior to reaching adulthood.

Nevertheless, it is clear that many adult educators have indeed sought to identify traits and characteristics of adult learners as increased attention has been given to the adult ability to learn, grow, and change (Waldron & Moore, 1991). The contributions made in this regard have been found to be very useful.

This chapter examines aspects of adult education, workforce education, and adult learning. It is divided into five sections. The first section outlines the development of andragogy; the second section explores learning and adult learner characteristics as related to andragogy (and compared to aspects of the situational leadership model); the third section identifies andragogical applications in professional practices; the fourth section provides a critical analysis of andragogy; and the fifth serves as a vehicle for concluding remarks.

The Development of Andragogy

Andragogy Defined

Andragogy is defined as the art and science of helping adults learn (Knowles, 1984). Andragogy is derived from the Greek words 'aner' (genitive case 'andros') meaning man or adult and 'agogos' which means leader (VanGent, 1996). The word
andragogy was actually coined in 1833 by a German teacher, Alexander Kapp, who used it to describe the educational theory of Plato (Nottingham Andragogy Group, 1983; Davenport & Davenport, 1985). Another German, Johan Frederick Herbart, adamantly opposed the use of the term for such a purpose and so, andragogy disappeared for nearly a century. The term reappeared in 1921, and was being used extensively by the 1960s in France, Yugoslavia, and Holland (Davenport & Davenport, 1985).

Introduction of Andragogy in the United States

The term, andragogy, was introduced into American literature by Martha L. Anderson and Eduard C. Lindeman in 1927 (Anderson & Lindeman, 1927a). Anderson & Lindeman translated literature describing the folk-high school system in Germany and introduced the concept of andragogy. Lindeman argued that adult education should be confined to small groups, be a lifelong activity, be non-vocational, be concerned with situations instead of subjects in teaching, and have primary emphasis placed on the learner’s experience (Brookfield, 1984). “Andragogy” first appeared in a dictionary in the Addenda of Webster's 3rd New International Dictionary (Unabridged) in 1981.

Promotion of the term, andragogy, in the United States

The term, andragogy, was reintroduced in 1968 and popularized in the United States by Malcolm Knowles (Knowles, 1980). Knowles elaborated upon his ideas in The Modern Practice of Adult Education: Andragogy Versus Pedagogy, a book which he aimed at “exploring a comprehensive theory that would give coherence, consistency, and technological direction to adult education practice” (Knowles, 1970). Knowles gleaned heavily from Lindeman who had culled heavily from the philosophy of Dewey (McKenzie,
1979). He also acknowledged that two self-theorists in psychology, Carl Rogers (1983) and Abraham Maslow (1968) had a profound influence on the development of his andragogical model (Tennant, 1986). Undoubtedly, Knowles has had a formative influence on the field of adult education and has managed to claim a coveted place in the history of adult education because of his promotion of andragogy.

Assumptions of andragogy.

Initially, andragogy was premised on four crucial assumptions specific to the characteristics of adult learners that were said to be different from the assumptions about child learners on which traditional pedagogy was premised (Knowles, 1980). These assumptions were that as a person matured, 1) his self-concept moved from one of being a dependent personality to one of being a self-directing human being; 2) he accumulated a growing reservoir of experience that became an increasing resource for learning; 3) his readiness to learn became increasingly oriented to the developmental tasks of his social roles; and 4) his time perspective changed from one of postponed application of knowledge to immediacy of application and accordingly, his orientation toward learning shifted from one of subject-centeredness to one of problem-centeredness (Knowles, 1970; 1980).

In his later works, Knowles (1984;1990) identified five assumptions characteristic of learning in adulthood. They were (1) self-concept, (2) prior experience, (3) readiness to learn, (4) learning orientation, and (5) motivation to learn. He argued that the world may exist, but it is the individual’s experience of that world that is most important to
learning. He thought that learning was more subjective than objective with an emphasis on individual interpretation, integration, and even transformation of knowledge.

**Andragogy versus pedagogy.**

Knowles initially distinguished sharply between the way in which adults and children learn. Andragogy referred exclusively to helping adults learn. He emphasized that learning in childhood could be termed pedagogy (defined as the art and science of teaching children) and was a content model. VanGent (1996) defined a content model as being associated with traditional learning, based on the teacher's direction, transmission techniques, and prescribed subject matter (teacher centered). Conversely, learning in adulthood was thought to be more learner-centered than teacher-centered wherein the teacher is primarily a facilitator of the learning process.

In 1979, Knowles recognized that andragogy and pedagogy were not discrete processes. He concluded that andragogy and pedagogy were not antithetical models, one for adults and the other one for children. He came to acknowledge that "some pedagogical assumptions were realistic for adults in some situations and some andragogical assumptions were realistic for children in some situations" (1979, p. 53).

Other theorists emerged to share Knowles' idea of no longer keeping these processes completely separate, also. For instance, Yonge (1985) asserted that the essential task of the teacher is the same in the case of an adult or a child in the sense that the teacher knows some content which must be reduced to its essentials so that it can be managed and assimilated by the learner. How that content is reduced typically will be quite different for a child and for an adult. He argued the point that the differences in
teaching adults and in teaching children are such that an andragogy-pedagogy distinction is neither necessary not defensible. Yonge's assumptions were that andragogy involved an adult accompanying another adult to a more refined, enriched adulthood. Pedagogy was thought to involve an adult accompanying a child so the latter may eventually become an adult. He stated that the ultimate aim or intent of the learning activity must be considered before meaning can be said to be pedagogical or andragogical. Therefore, he concluded that a pedagogy-andragogy difference cannot be justified by simply focusing on teaching and learning. Nevertheless, he acknowledged that there are important differences in guiding a child and in guiding another adult in a teaching or learning situation.

**Learner-centered versus teacher-centered**

If a program is learner-centered, the evaluation should identify each learner's objectives and the extent to which each was helped to meet his or her objectives. Additionally, the learner's freedom to accept or reject learning should be considered in interpreting data about the results (Steele, 1989).

Teacher-centered or dependent learning was conversely thought to be pedagogical and not suited for helping adult students to learn. Knowles (1980) considered the idea of a progression from dependency to self-direction to be part of maturing into adulthood. Knowles supported the notion of using learning contracts to facilitate the evaluation of learning in adult learning situations. He assumed that each learner had his/her own style and pace of learning, outside commitments, pressures different from youth, goals, and internal motivations. Learner-centered or independent learning was initially thought by Knowles to be more suited for adults and was considered to fit the andragogical model.
Teacher-centered (directed) learning assigns the teacher full responsibility for making all decisions about what will be learned, how it will be learned, when it will be learned, and if it has been learned. It is primarily comprised of fact-laden lectures, assigned readings, drills, quizzes, role memorizing, and examinations (Knowles, 1984; 1990). The learner has little or no negotiating power to determine what will be taught (course content) or how it will be taught (teaching methods used) and is confined to the submissive role of following an expert's (teacher's) instructions. Being a dependent learner is not a defect, but it can be a serious limitation to learning.

Learning and Adult Learner Characteristics

This section on learning and adult learner characteristics includes discussion on 1) Learning; 2) The Andragogical Model; 3) The Situational Leadership Model; and 4) Andragogy as related to Workforce Education.

Learning

There has been some tendency to substitute the term “adult learning” for adult education (Courtney, 1989). Plecas and Sork (1986) argued that the primary phenomenon under study in adult education is really organized learning. In this regard, Knowles contributed to the development of a body of knowledge relating to learning in adult learner populations when he accomplished a paradigmatic shift on the field of adult education through his promotion of andragogy.

Learning is defined in a multitude of ways. It is defined “as the process of making a new or revised interpretation of the meaning of an experience which guides subsequent understanding, appreciation, and actions” (Mezirow, 1990). Jarvis (1983; 1995) defined
learning “as the process of transforming experience into knowledge, skills, attitudes, values, feelings, and the like.” Still elsewhere in the literature, Boyle asserted that “learning does not necessarily change behavior, but it does change the potential for behavior” (Merriam, 1988). Learning is not only being examined on an individual level in today’s organizations, but is also being looked at in terms of total organizations as well (Senge, 1990).

Three general assumptions were described by Knowles (1980) in the andragogical approach to teaching and learning. It was assumed that: (1) Adults can learn, (2) Learning is an internal process, and (3) There are superior conditions of learning and principles of teaching.

Learning activities are generally thought to be broadly categorized as behaviorist, cognitivist, or humanistic. The humanist paradigm is the predominate paradigm of practice within the literature of North America adult and continuing education. Andragogy epitomizes humanism. Facilitators in the tradition of the humanist paradigm respect the integrity of the learners and grant learners’ interests and demands a great deal of validity. The learning activity is essentially collaborative. The adult education is seen as a democratic, cooperative venture, with facilitators assuming no particular status within a learning group simply by virtue of their knowledge or experience. At the root of the humanistic paradigm is the felt-needs rationale. This rationale holds that good practice in adult education is equated with meeting learners’ felt-needs, that is, with satisfying the educational demands and wants expressed by learners in the manner they prescribe (Brookfield, 1989).
The Andragogical Model and Learning

The andragogical model proposed by Knowles involved seven elements (VanGent, 1996). The first element involved establishing a climate conducive to learning. The second element involved creating a mechanism for mutual planning. The third element involved diagnosing the needs for learning. The fourth and fifth respectively involved formulating program objectives and designing a pattern of learning experiences. The sixth involved conducting these experiences with suitable techniques and materials. The seventh element involved evaluating the learning outcomes and rediagnosing learning needs (Knowles, 1990; VanGent, 1996). Knowles' andragogical approach to adult education assumes that the point at which an individual achieves a self concept of essential self direction is the point at which he/she psychologically becomes an adult (Tennant, 1986).

Carl Rogers emphasized the self-actualization of the learner along with existentialism. Existentialism refers to the concept of emphasizing the person, his/her potentialities, self-realization, and finding meaning in life. Existentialism has a linkage to humanism in that both have tenets of responsibility, involvement, and action plus a belief that an individual is capable of choosing and growing (Greening, 1971). Roger's work reflects humanistic concerns of adult education. Rogers argued throughout his work that the goal of education is a fully functioning person (Jarvis, 1995). Knowles embraced "self" theory espoused by both Rogers and Maslow, who is well-known for his self-actualization theory. Knowles regarded self-directed learning as one of the manifestations
of andragogy. This emphasis on self and the need for self-development and self-direction becomes the common thread among Knowles, Maslow, and Rogers.

Knowles strongly felt that adult learners chose what they wanted to learn based on their desires to solve a problem or meet a perceived need. Because of this, he viewed adult learners as especially ready to learn because they were highly motivated to learn. The essence of the basic andragogical assumptions regarding how adults learn, and introduced by Knowles, were identified as early as the 1920s by Lindeman (1926). The assumptions were supported by later research and came to constitute the foundation of modern humanistic adult learning theory.

Mezirow (1991) delineated ideal learning conditions to exist when those participating in the learning process:

a) have accurate and complete information;
b) are free from coercion and distorting self;
c) are able to weigh evidence and assess arguments as objectively as possible;
d) are open to alternative perspectives;
e) are open to critically reflect upon presuppositions and their consequences;
f) have equal opportunity to participate (including the opportunity to challenge, question, refute, reflect, as well as, hear others do the same thing); and
g) are able to accept an informal, objective, and rational consensus as a legitimate test of validity.

Lindeman did not consider these conditions in his writings; instead he simply assumed that adults were motivated to learn as they experienced needs and interests that
learning would satisfy. For instance, he argued that adults' orientation to learning was life-centered, that experience was the richest resource for adult learning, that adults have a deep need to be self-directing, and that individual differences between people increased with age. Therefore, optimal provisions for differences in style, time, place, and pace of learning must be made.

Knowles’ andragogical model caused Pratt (1993) to declare Knowles to be the most potent adult educator to move away from behaviorism since Lindeman. Findings from studies have been used to show the usefulness for investigating the circumstances in which adults learn.

Studies conducted and reported in 1927 indicated a decline in learning capacity of about 1 percent per year after age twenty five (Thorndike, 1927). However, follow-on studies by Thorndike and Lorge revealed that what declined was really the speed of learning, not intellectual power. Findings showed that even the decline in the speed of learning was likely to be minimized by the continued use of the intellect. Documented research on adult learning clearly indicates that the basic ability to learn remains unimpaired throughout the life span. Therefore, the assumption that adults can learn is research-based (Knowles, 1970).

In his book, Using Learning Contracts (1986;1991), Knowles included a contract learning study guide which focused on learning as an internal process with a locus of control of the process residing in the learner. He purported that this process could be facilitated by outside helpers. Knowles was a proponent of learning contracts because he believed that any learning plan and strategy must be highly individualized. Contract
learning is an alternative way of structuring a learning experience. It was designed to replace a content plan with a process plan (Knowles, 1986; 1991, p.39). Instead of specifying how a body of content will be transmitted (content plan), it specifies how a body of content will be acquired by the learner (process plan). A learning contract typically specifies (1) the knowledge, skills, attitudes, and values to be acquired by the learner (learner objectives); (2) how these objectives are to be accomplished (learning resources and strategies); (3) the target date for their accomplishment; (4) what evidence will be presented to demonstrate that the objectives have been accomplished; and (5) how this evidence will be judged or evaluated. Often a grade is also specified. Learning contracts are used with learner-centered approaches to learning which often suggest self-directed learning. Self-directed learning is closely aligned with the andragogical model.

The Situational Leadership Model

The Situational Leadership Model was developed by Paul Hersey and Kenneth Blanchard (Hersey & Blanchard, 1988). The model places emphasis on providing for the followers, contrasted to leaders, what they cannot provide for themselves. The leader identifies the development level of the followers and selects the leadership style which best suits the situation. Then, the followers contract with the leader for the style which best suits their perceived development needs. Hersey & Blanchard argue that management is situational.

Grow (1991) borrowed key concepts for his Staged Self-Directed Learning Model (SSDL) from the Situational Leadership Model. Grow argued that some features of self-direction are distinctly situational and thought the goal of the educational process should
be to produce self-directed, lifelong learners. He also placed importance on problem-centeredness. When a problem-centeredness focus promotes the transfer of learning currently, it is known as workforce education.

**Andragogy as Related to Workforce Education**

Workforce education is that form of pedagogy that is provided at the prebaccalaureate level by educational institutions, by private business and industry, or by government-sponsored, community-based organizations where the objective is to increase individual opportunity in the labor market or to solve human performance problems in the workplace (Gray & Herr, 1998). Workforce education differs from general education in that the outcome goals of the latter are independent of employment. Learning to read, for example, is general education; learning to read unique technical report manuals is workforce education. Learning how to solve a simple algebraic equation is general education; learning how to use Ohm's law in electrical work is workforce education.

In workforce education, the learning that occurs effectively transfers to the workplace and thereby results in the learner making the transition from one state of occupational effectiveness to a more advanced state. This transition often results in improved performance.

Not totally unlike workforce education, andragogy rests on two implicit principles of learning. Principle number one assumes knowledge to be actively constructed by the learner, not passively received from the environment. Principle number two assumes learning to be an interactive process of interpretation, integration, and transformation of one's own world. There is an emphasis on the consideration of the psychological and
individualistic nature of the learner. The emphasis is placed on the person's self-concept, prior experience, and perceived needs in conjunction with how the learner learns.

Knowles assumed each individual to be autonomous and desiring of self-improvement. The learner is also assumed to have the capacity to be self-directed quite apart from the social structure that might bear on personal characteristics, aspirations, and the learning process. Finally, the individual is believed to be unique, and any individual differences (whether arising from experience, felt needs, or genetic nature) are to be respected and nurtured as the individual learners move toward self-fulfillment (Knowles, 1984; 1990).

Knowles (1984) asserted that the andragogical model assumes that adults become ready to learn when they experience a need to know or do something in order to perform more effectively in some aspect of their lives. Chief sources of readiness include the developmental tasks associated with moving from one stage of development to another.

It was assumed that because adults are motivated to learn after they experience a need in a life situation, they enter an educational activity with a life-centered, task-centered, or problem-centered orientation for learning. For the most part, it is assumed that adults do not learn for the sake of learning. Instead they learn in order to perform a task, solve a problem, or live in a more satisfying manner. Therefore, they can be thought to possess a high degree of readiness-to-learn.

The andragogical model predicates that the more potent motivators for learning are internal. Motivators such as self-esteem, recognition, better quality of life, greater self confidence, and self actualization are more likely to exist to a greater degree in adults than external motivators such as a salary increase or a better job. Knowles argued that when

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the principles of andragogy were translated into a process for planning and operating educational programs, that process turns out to be quite different from the curriculum planning process traditionally employed when teaching children. However, Elias (1979) argued that, except for the planning, teaching adults was essentially the same as teaching children. He concluded that any differences between the two processes were not essential and, therefore, cannot form the basis for a distinction between andragogy and pedagogy. He made the case that experience-centered education was not only possible for children, but that in many instances, it was actually more possible for children than adults.

Closer scrutiny of the five assumptions identified by Knowles for adult education led him to back off his original stance that andragogy characterized only adult learning (Knowles, 1990). He concluded that andragogy provides a set of guidelines for designing instruction with learners who are more self-directed than teacher-directed more so than defining the uniqueness of adult learning. In the final analysis, perhaps guidelines are what are most useful in order to better understand adult learner needs.

Knowles (1984; 1990) purported that the learner is self-directing. Adult learners have a deep psychological need to be perceived by others, and treated by others, as capable of taking responsibility for themselves. Therefore, andragogical learners are generally termed to be more student-centered than teacher-centered. They are more likely to enter into an educational activity with some degree of self-directedness.

**Staged Self-Directed Learning (SSDL) Model**

Self-directed, lifelong adult learning is the single most important outcome of formal education (Grow, 1991). Grow developed a model which describes a learner’s
readiness-to-learn in stages. Staged self-directed learning is based on the Situational Leadership model of Hersey and Blanchard (1988) and is an example of a tool that can be used to help learners to be more self-directed. The model includes four leadership styles presented in four stages that are intended to be matched to the learner’s stage of self-direction. The degree of “learning readiness” in the learner ranges from “not able, not willing or motivated” to do the task at hand, to “able and willing” to do the task at hand.

The first stage addresses the dependent learner who needs explicit directions on what to do, how to do it, and when. The role of the Stage 1 educator is one of authority. Students at Stage 1 require much coaching. Stage 2 addresses the interested learner who responds to motivational techniques. Interested learners are willing to do assignments in which they see a purpose. They will continue to advance along the continuum toward complete self-directedness if they are inspired to learn at this stage. Thus, the role of the educator at Stage 2 becomes one that emphasizes guidance and motivation. Learners have skill and knowledge at Stage 3. They see themselves as participants in their own education. Learning strategies can play a key part in effecting learning at this stage. Therefore, the role of the educator at Stage 3 is seen as one of facilitation. Stage 4 describes learners of the highest self-direction and is used to address learners who set their own goals and standards, with or without help from experts. Learners at this stage are both willing and able to take responsibility for their learning, direction, and productivity. They exercise skills in time management, project management, goal-setting, self-evaluation, peer critique, information gathering, and use of educational resources. The most mature Stage 4 learner can learn from any kind of teacher, but most Stage 4 learners
thrive in an atmosphere of autonomy. Educators and trainers can help adult learners move along this continuum by choosing a mix of interactions with the learner that matches his/her readiness-to-learn so the task at hand can be accomplished. When a match is made, the learner is helped to become more self-directed.

When examining andragogical methods which promote self-directedness, it is clear that the approaches have been applied in both formal and non-formal settings and Knowles’ contributions to adult education are widely recognized in the literature. Thus, Knowles’ contributions have been widely accepted for many purposes (Pratt, 1993).

Grow (1991) defined self-directed learning to mean the opposite of dependent learning. He used the term to refer to the degree of choice that learners have within an instructional situation. Grow’s Staged Self-Directed Learning Model (SSDL) emphasizes learner autonomy or self-directed learning and tends to separate educators and trainers of adults from their counterparts in childhood, secondary, and higher education (Brookfield, 1986). One of the major strengths of the SSDL model is that it helps the educator detect a mismatch between the student’s comfortable learning style and the approach taken to help the student learn by the educator in each of the four learning stages. The educator’s purpose is to match the learner’s stage of self-direction and prepare the learner to advance to a higher stage (Grow, 1991). Figure 1 introduces the four stages of the SSDL model. Fully self-directed learning is not possible in an institutional setting and the SSDL model does not require an institutional setting.
Dependent learners need an authority-figure to give them explicit directions on what to do, how to do it, and when. Learning is teacher-centered for these students. Some learners are dependent in all subjects they are taught while others are dependent only in some subjects. Being a dependent learner is not a defect, but it can be a serious limitation to learning (Grow, 1991). In contrast, self-directed learners set their own goals and standards - with or without help from experts. They use experts, institutions, and other resources to pursue these goals. Learners at Stage 4 are both able and willing to take responsibility for their learning, direction, and productivity.

Learner-centered approaches to learning support students working in teams or small groups. Learner-centered practices emanating from Knowles' concept regarding self-directedness include 1) treating students and clients like dignified, competent human beings, 2) providing a climate and environment more congenial to adults than a
schoolroom atmosphere, 3) basing the content of course offerings on the expressed needs of the students, 4) organizing presentations and courses to actively involve students in their own learning, and 5) having students learn about one another’s strengths and resources so they can use one another as learning resources.

Even though there is not yet agreement on the precise nature of the learning process, there is agreement that learning is an internal process (Crow & Crow, 1996). This process is thought to be controlled by the learner and engaging his/her whole being to include intellectual, emotional, and physiological functions. The central dynamic of the learning process was perceived to be the experience of the learner, with experience defined as the interaction between an individual and his environment. Certain conditions of learning that Knowles (1970) thought were more conducive to growth and development than others were: 1) the learner’s felt need-to-learn; 2) the learning environment being characterized by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences; 3) the learners perceiving the goals of a learning experience to be their goals; 4) the learners accepting a share of the responsibility for planning and operating a learning experience, and therefore have a feeling of commitment toward it; 5) the learners actively participating in the learning process; 6) the learning process being related to and making use of the experience of the learners; and 7) the learners having a sense of progress toward their goals through their learning activities.

**Andragogical Applications in Professional Practices**

Knowles believed that learning and teaching are interrelated and intertwined (Knowles, 1970;1980). Because of rapid changes in technology, individual educators and
trainers must often concurrently assume the role of both one who acquires new learning and one who facilitates new learning in the adult student. Therefore, their learning and teaching frequently become interrelated and intertwined.

Knowles described those who teach adults as ideally possessing a genuine respect for the intrinsic capacity of adults to be self-directing. They should derive their greatest satisfaction from accomplishment through others and they should value the experience of others as a resource for accomplishing both work and learning by themselves and others. They should be willing to take risks that are involved in experimenting with new ideas and new approaches, and failures as things to be learned from (rather than to be defensive about). They should have a deep commitment to and skill in the involvement of people in organizational and educational processes and they should be able to establish warm, empathetic relationships with people of all sorts and be able to see the world through their eyes. They should be good listeners and have a deep faith in the potency of educational processes for contributing to the solution of organizational and societal problems. Finally, they should engage in a process of continuing education for themselves (Knowles, 1970; 1980). Those who deliver education and training to adults could benefit from being as Knowles describes. To effectively employ assumptions of the andragogical model in professional work should produce gratification in seeing students at the various levels of self-directedness move to an even greater degree of self-directedness. Also, it is important to establish a climate conducive for learning in which the students feel encouraged to assume more responsibility for their own learning (Vella, 1994).
In concert with the SSDL model (Grow, 1991), it is important for the educator/trainer to be able to assess the stage of self-directedness at which adult students are most comfortable. A mismatch between the instructor’s teaching style and the learner can lead to problems such as rebellion and boredom for students with a high degree of self-directedness. On the other hand, some guidance and close supervision are needed for those students with lower degrees of self-directedness who lack skills for improving their self-directedness. According to Grow, these students want and need guidance and some close supervision. The goal is to facilitate the student into assuming a greater degree of self-directedness so that the student becomes confident and interested enough to continue learning on his/her own.

Educators and trainers should continually search for, and integrate proven theory into their educational processes. The theory should be generated through the systematic analysis of empirical data and should especially provide a style for research on particular areas of behavior (Glaser & Strauss, 1967). This is often challenging to realize.

Nevertheless, educators and trainers should attempt to take advantage of opportunities to use andragogical applications as they are presented.

**A Critical Analysis of Andragogy**

Experts in the field of adult education have written much about andragogy. This section includes selected critical analyses of andragogy relating to (1) adult learning versus the learning in childhood, (2) teacher-centered learning versus learner-centered learning, and (3) other perspectives relating to andragogy.
Adult Learning versus Learning in Childhood.

The defenders of andragogy have yet to prove that learning in adulthood is different from learning in children (Tennant, 1986). The first assumption of andragogy relates to self-concept. He stated that as a person matures, his self concept moves from one of being a dependent person to one of being a self-directing human being. Few persons would take exception to this assumption. However, the process of becoming independent and autonomous has been shown to begin as early as the age of two and recognized as continuing through childhood and adolescence, so that knowledge dispels the notion that one has to be an adult to experience the process of becoming independent and autonomous (Elias, 1979).

The second assumption of andragogy relates to experience. It has been shown that experience-centered education is possible with children. While prior experience has been recognized as a contributor to new learning for many adults, it is also true that prior learning for many adults work to prevent new learning from occurring. Many highly motivated adult students do not always have experience in the task at hand. But, it is apparent that they do possess something that seems to propel them to invest the time needed to achieve the desired level of proficiency. More research regarding the nature of the individual is needed to more fully understand how adults successfully plan and organize their self-directed learning.

The third assumption of andragogy addresses readiness-to-learn. Readiness-to-learn in children is claimed to be a function of biological development and academic pressure. In adults, readiness-to-learn is claimed to be a function of the need to perform
social roles (Tennant, 1986). The implication that the content of what is learned should be relevant to the learner's needs is probably valid. But, it can be argued that children also have a need to perform social roles and to adjust their behavior to different social settings. Conversely, adults often learn for no apparent reason except for the sake of learning as in exploration and curiosity.

The fourth assumption of andragogy states that as a person matures, his time perspective changes from one of postponed application of knowledge to immediacy of application. Children are claimed to have a conditioned, subject-centered orientation to learning thought to be future-directed. Their learning is not based on need, but rather on what they ought to learn for future consumption. Adults are claimed to have a problem-centered-need orientation to learning which has present time applications. Knowles contended that as a person matures, his orientation toward learning shifts from one of "subject-centeredness" to one of "problem-centeredness." The reality is that while this may be true, problem-centeredness cannot be restricted to adults. Organizing educational activities around problems can be equally applicable to children and adults. It can be seen that here again, the assumption does not lead inevitably to a differential learning process for adults and children (Tennant, 1986).

Motivation to learn is the focus of the fifth assumption of andragogy. The andragogical model predicates that the more potent motivators are internal (Knowles, 1984). The need for recognition, self-confidence, and self-actualization are thought to be internal motivators that are associated with self-esteem. If the more potent motivators are internal how do the external motivators associated with the larger societal need come to
transcend the internal motivators? After all, the readiness to learn in adults can be associated with needs that could be termed external motivators (Tennant, 1986). The distinction between adults and children appears to be from a social context rather than naturally occurring.

Other Perspectives Relating to Andragogy

Many individual interpretations of Knowles’ andragogical assumptions have been made solely because there was so much latitude inherent in them for such interpretations. The interchange regarding andragogy by Knowles (1979), McKenzie (1979), Knudson (1979), and Elias (1979) indicated that different interpretations are going to take place when simple definitions are used because meaning can not be applied to terms like andragogy, pedagogy, or even humanagogy without considering the other intervening variables such as environment (setting) or the intent of the learning episode. Humanology was Knudson’s attempt to coin a term that represented the differences as well as the similarities seeming to exist between all humans (Knudson, 1979). If Knudson’s Human Theory for Learning, “Humanology” were accepted, he argued, then there would be no need for an andragogy-pedagogy debate.

Yonge (1985) argued that there are qualitative differences in the ways adults and children typically learn. But, the differences were not really enough to sustain an andragogy-pedagogy distinction. Yonge’s primary argument was that the differences in teaching adults and children is such that an andragogy-pedagogy distinction is neither necessary nor defensible. It is generally understood that opposition to andragogy stems from adult educators having different philosophical bases.
Incomplete understandings of adults as learners have resulted from attempts to build bodies of knowledge relating to adult education (Flannery, 1994). Some of these misunderstandings have manifested themselves in the prevailing beliefs about adult learners in that they have implicitly and explicitly supported racism and sexism in our society. Racism is defined (Flannery, 1994) as the thoughts, acts, and procedures of a system that bases the power of one group over another on skin color.

Sexism is defined by Flannery as the thoughts, acts, and procedures of a system that bases the power of one group over another on gender. Sexism was further defined as the power of males over females. The presence of racism and sexism is reflected in the literature as it is noted in the society at large.

Flannery questioned whether the ideas and beliefs essential to andragogy and adult learning theory, in general, really represented the values of all people, especially the ways in which female adults learn. It was emphasized that when learning theories are based on individualism and autonomy, in reality, they reflect values and attributes thought to be primarily Western, white, middle-class, and male. She concluded that when we continue to promote learning theories that have individual achievement as a universal goal, we will continue to practice everyday racism in adult education.

Hartree (1984) makes the criticism that andragogy, as a unified theory, lacks coherent discussion of the different dimensions of learning. As a philosophy, it falls short because it does not incorporate epistemology. She emphasized that andragogy and existentialism both focus on the man rather than nature. As a result, both methodologies can be considered strongly individualistic and logically leading to anarchy (Hartree, 1984).
Hartree saw a tendency in adult education for "theories of adult learning" to be philosophical rather than purely psychological in basis. According to her, Knowles' andragogy fit this description. She also saw similarities among Knowles andragogy, Maslow's "self-actualizing" person, and Rogers "fully functioning" person in that all stressed "becoming" rather than "being." Because of this, the key role of the learner's experience was thought to be linked to the existentialist position. She concluded that Knowles was arguing for the authentic learner and the "authenticating" teacher (Hartree, 1984).

Opponents and proponents of andragogy tend to argue their positions from a personal and impressionistic perspective while ignoring the growing body of literature (Davenport & Davenport, 1985). If additional research can confirm that andragogical orientations can be defined, measured, and evaluated, then andragogy may well possess the explanatory and predictive functions generally associated with a fully developed theory.

Since Knowles stopped claiming andragogy to be unique to adults in his later writings (1984; 1990), the adult learning theory categorization of andragogy became more ambiguous than ever. Nonetheless, andragogy has achieved the status of a theory, without having been systematically worked out as one, simply because it reflects the ideological currents of time (Jarvis, 1983). Andragogy appears to fall short of good theory because it is more related to a set of procedures and practices that constitutes a distinctive form of education. In a sense, it is more suited to adults because it acknowledges their needs,
experiences, and self-directed nature. But, since it can apply to children also, andragogy has become a technology of instruction or facilitation of learning (Pratt, 1993).

Mark Tennant (1986) leveled several criticisms at Knowles' andragogical approach to adult education. He identified a growing gap between the fact that the culture does not nurture the development of the abilities required for self-direction and the need to be increasingly self-directing. He also believed that Knowles' interpretation which advised that the andragogical model should be applied selectively, as the situation permits, was at odds with the thrust of his thinking. He further emphasized that the student directs the content and the educator directs the process. Therefore, the assumption that self-directed learners have the capacity to control and plan the content and processes through which they learn simply was not so. He suggested that Knowles supported myths such as (1) the need for self-direction being rooted in our constitutional make-up; (2) that self-development be termed as a process of change towards higher levels of existence; and (3) that adult learning is fundamentally different from learning in childhood. It appears that even the experts in the field cannot agree on the differences between learning in childhood and learning in adulthood.

Concluding Remarks

Andragogy, as proposed by Knowles, has taken on a tone of a doctrine rather than a field of study. It has grown past the stage when its development was mainly determined by the search for its own specific characteristics and the need to emphasize its differences from pedagogy (Krajnc, 1989). The focus is now being directed toward motivation for learning in adults. Yet, disagreement still exists regarding whether andragogy constitutes
a learning theory. While there is much disagreement relating to the question of andragogy fitting the definition of a theory, there is little disagreement that Knowles is regarded in the literature as the father of andragogy in the United States. This agreement comes because he has been credited for the popularization of the term andragogy in the United States, although he did not actually invent it.

Existentialism is mentioned in the literature as a philosophy which influenced self-directedness. Existentialists stress the central role of man as actor and initiator, creator of himself and of meaning in the world. Both existentialism and andragogy are strongly individualistic and reflect a philosophy of the subject rather than the object (Hartree, 1984). Andragogy further emphasizes the autonomy and self-directing nature of the adult and the need for the individual to participate actively in his own learning. Self-directing is the operative characteristic.

Would it then be fair to conclude that self-directedness is necessarily good? Caffarella & O'Donnell (1987) cautioned that assumptions such as 1) self-directed learning is good; 2) people prefer self-directed learning; and 3) adults want and need help in self-directed learning - all are yet to be tested. Based on their position, it can be concluded that more research is also needed in this regard.

The literature shows that andragogy, itself, is not a theory of adult learning nor is it a theory of adult teaching, even though its humanistic perspective might provide some guidelines for an approach to teaching adults. Andragogy includes within it an ideological perspective that is both idealistic and humanistic.
But, andragogy, presented as a true theory, does not fit the Kerlinger (1992) definition which states that "a theory is a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena" (1992, p.9).

As we approach a new millennium, and note that demographic changes indicate the United States is becoming a nation of adults, more emphasis is expected to be placed on how adults learn. Closer examinations of what motivates adults to learn will most probably take place. Few will deny that more empirical research is needed to diminish the andragogy-pedagogy debate, but even so, additional research is not likely to end the debate. The continuing debate suggests that it may be more useful to make a transition of the focus of the debate to learner-centered educational processes versus teacher-centered educational processes rather than pedagogy versus andragogy.

It was noted in the literature that most of this century, the United States' population was numerically dominated by young people. That has changed. Persons in their middle years are predicted to dominate the next decade. This is largely a result of the 'baby boom' after World War II. Thus, the increase in births at that time is now forcing adult educators to reexamine not only what they do to help adults learn, but also how they go about the process. All types of learning will have to be revisited (Cross, 1981). Further research is needed even though the literature suggests that an adult probably does learn best when the learning process is in response to a problem or a need. Additional
research could very well provide more conclusive evidence of how adult students actually learn best. Proof of a comprehensive theory is what is so sorely needed.

In the meantime, so what, if many of the attempts by adult educators to define what is unique about learning in adulthood have been questionable. Their contributions to the learning process have significantly outweighed the lack of uniqueness. Certainly the assumptions of Knowles are considered to be useful in adult learning processes no matter if they are not adult-unique.

Efforts to define what is unique about learning in adulthood will most likely continue to take place. Adult educators and researchers will most probably continue to identify and compare noted differences between learning in adulthood and other learning. The stages of self-direction/development delineated in the SSDL (Grow, 1991; Grow, 1994) appear to be useful in helping adults learn, but, until researchers provide an accepted theory for adult education, Knowles' andragogical assumptions are going to continue to be embraced by educators and trainers who are searching for anything closely resembling a theory relating to how adults learn. Not surprisingly, amidst all of the debate regarding conditions for learning, the andragogical model still emerges as one of the most important contributions to learning in adulthood primarily because of the assumptions of andragogy and the efforts of Knowles.
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Research Design

The design of this study is descriptive-correlational. Descriptive research involves collecting data to answer questions concerning the current status, prevailing conditions, practices, and attitudes relating to the subject of the study (Gay, 1996). Correlational research involves collecting data in order to determine the degree to which a relationship exists between two or more variables (Fraenkel & Wallen, 1993).

Population

The target population for this study was comprised of all full-time faculty who teach/train in the areas of business and education in Ohio colleges and universities. The census population comprised the frame for the study. The frame included those full-time faculty who teach or train within: a) the Departments of Business and Education at Cedarville College, Cedarville, Ohio; b) the Colleges of Education and Business & Industry at Central State University, Wilberforce, Ohio; and c) the College of Business & Administration and the College of Education & Human Services at Wright State University, Fairborn, Ohio. Population, by institution, is shown in Table 1. Cedarville College is a private, Baptist-affiliated institution; it enrolls 2,664 predominately Caucasian students. Central State University is a state-supported institution. It enrolls
predominantly Black students; it has a total student enrollment of 1,050. Wright State University is a predominately Caucasian, state-supported institution; it has a full-time student enrollment of 15,697 (Rodenhouse, 1998).

The following table summarizes the full-time faculty employed in the colleges/departments of Business and Education at the three participating institutions comprising the census population:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Type</th>
<th>Population</th>
<th>Total Faculty in Business and Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Business</td>
<td>Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Cedarville College</td>
<td>Private</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Central State University</td>
<td>Public</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Wright State University</td>
<td>Public</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>89</strong></td>
<td><strong>71</strong></td>
</tr>
</tbody>
</table>

Table 1: Faculty Census Population by Institution.

Letters of invitation were mailed to 160 university professors asking them to participate in this census study. Copies of both the letter and a follow-up letter are found in Appendix E. Professors/trainers were identified from personnel lists obtained from Cedarville College, Cedarville, Ohio; Central State University, Wilberforce, Ohio; and Wright State University, Fairborn, Ohio. The lists identified the full-time faculty members
working in the Departments or Colleges of Business and Education at the respective institutions for the 1998-1999 academic year.

Instrumentation

This study was conducted using a seven-part survey instrument. A copy of the survey instrument is found in Appendix A. The survey instrument was developed from research questions established for this study and a review of human resource development and adult education literature. The participants were asked questions that were used to assess the extent to which they use multimedia presentation software in educating adult students.

A five-point, Likert-type scale was used in Part I (For what purpose and frequency is multimedia presentation software used in the delivery of education or training to adults) to rate statements which related to purposes for which educators/trainers used multimedia presentation software. The five-point Likert-type scale, 0 - 4, was used to indicate frequency in usage of multimedia presentation software for various educational/training purposes; never use = 0, rarely use = 1, occasional use = 2, frequent use = 3, and very frequent use = 4.

In Part II, educators/trainers were asked to use a five-point Likert-type scale, 0-4, to indicate their level of usage of specified types of multimedia presentation software; never use = 0, rarely use = 1, occasional use = 2, frequent use = 3, and very frequent use = 4. Level of use scores for each selected type of software were tallied and rank ordered for both the business and the education populations at each educational institution included in survey. A mean score for each selected type of software was computed in
order to determine which multimedia presentation software was used most often by the 
educators/trainers.

In Part III, educators/trainers were asked to rank four statements, using 1, 2, 3, 
and 4, to describe how they learned to use multimedia presentation software. If the 
educator/trainer did not use multimedia presentation software, he/she was asked to place a 
check mark on the line provided and skip to Part VI. The four statements included do 
not use, by formal training session, by formal educational course, by on-the-job training, 
and by self-taught options which included self-study, practice, manual and video. A '1' 
indicated the most significant method, a '2' indicated the second most significant method, a 
'3' indicated the third most significant method, and a '4' indicated the least significant 
method.

In Part IV, educators/trainers were asked to use a four-point Likert-type scale, (0-3), to 
indicate how valuable they believe the use of multimedia presentation software is in 
performing five selected activities which could be included in performing their jobs. The 
activities are a) teaching adults in a formal classroom setting, b) conducting training 
sessions in a business/industry setting, c) making informational presentations to 
colleagues, d) developing instructional materials, and e) accessing materials on the 
Internet. Not at all valuable = 0, very limited value = 1, somewhat valuable = 2, and very 
valuable = 3.

In Part V, twelve barriers/problems encountered when using multimedia 
presentation software are addressed. Educators/trainers were asked to use a five-point 
Likert-type scale to indicate the frequency in which they encountered specified problems
or barriers when using multimedia presentation software. The scale is interpreted 0 = never a barrier/problem, 1 = seldom a barrier/problem, 2 = sometimes a barrier/problem, 3 = often a barrier/problem, and 4 = always a barrier/problem. The data were tallied and analyzed as ordinal data.

Demographic characteristics are addressed in Part VI. Educators/trainers were asked to indicate (1) their highest educational degree, (2) the year the highest degree was earned, (3) the year the educator/trainer participated in a formal training session to learn how to use multimedia presentation software, (4) whether the employer paid for the formal training, (5) whether the educator/trainer uses the software for which he/she was trained, (6) sex, (7) age, (8) present position, (9) how many years of teaching at the university/college level, (10) how many years has educator/trainer been conducting training sessions in a business/industry setting, and (11) how many years has educator/trainer used multimedia presentation software. Differences, if any, between the faculty employed in education and the faculty employed in business at each selected educational institution were noted.

Analyses were made to determine if relationships exist among the three groups of educators and trainers at the three institutions included in the study in terms of, their sex, their age, their position title, and their area of employment (education or business). These nominal data and interval usage data were used together to describe any differences in usage of multimedia presentation software. Differences, if any, in age and multimedia presentation software level of use were noted.
In Part VII, educators and trainers were given the opportunity to provide comments and suggestions they may have had relating to the study. The comments and suggestions can be found in Appendix F.

The instrument used in this study was assessed for non-random error (both face and content validity) by using a panel of six university professors or trainers with experience in developing instruction using multimedia methods and by also conducting a field test. The panel of experts ascertained that the self-evaluative responses would indeed produce appropriate measures for the questions asked in the instrument. Clarity, thoroughness, ease-of-use, appropriateness of the survey instrument, and the overall suitability of the survey instrument were the focus of the comments from the panel of experts. The comments from the participants in the panel of experts were used to establish both face and content validity of the survey instrument. The letter to the panel of experts participants, a guide for them to use in accessing the survey instrument, and a list of the panel of experts participants can be found in Appendix B. A field test was conducted following the panel of experts review. The field test involved six university professors/trainers who were asked to comment on the appropriateness of the items in the instrument and the construction of the instrument. A copy of the letter to the field test participants can be found in Appendix C.

A pilot test (study) was conducted prior to the census survey to serve as a small-scale trial of the census survey. The purpose was to detect any problems with the questionnaire before the study proper was conducted. A test/retest method was used to determine the extent to which scores from the survey instrument were reliable over time.
by correlating the scores from the first mailing with the scores from the second mailing of
the same instrument to the same individuals. Results from the pilot test yielded a
correlation coefficient of “r” = .98. The results were used to determine the measure of
reliability for the survey instrument.

To determine participants in the pilot test, names of 25 persons were drawn from
the lists of full-time faculty members employed at Antioch University, Yellow Springs,
Ohio; Otterbein College, Westerville, Ohio; Wittenberg University, Springfield, Ohio; and
Capital University, Columbus, Ohio. The faculty members who participated in the pilot
test were employed in the areas of business or education and were not involved in the
census study in any other capacity. Letters were sent to the persons whose names were
drawn to participate in the pilot test. Copies of the letters to the pilot test participants can
be found in Appendix D.

Test/retest is a method for estimating reliability. The test/retest coefficient of
stability was used for all items in the survey instrument. The instrument was administered
to the pilot test group and then following a ten-day period, the same instrument was
administered to the group again (r = .98). The results were analyzed for revision or
elimination of items with low percentages. Minor changes were made, but no items were
eliminated. For the summated items, Cronbach’s alpha was used to estimate reliability as
the coefficient of internal consistency. The correlation of internal consistency was
Cronbach’s alpha = .75 for the first mailing and Cronbach’s alpha = .67 for the second
mailing. The measures of reliability were interpreted as a correlation coefficient with
“good” reliability being represented by a number as close to “+1.00” as possible.
No attempt was made to generalize the results to any other population or situation because the extent to which judgment from the census population relied on in this study cannot be equated to a typical sample.

**Data Collection**

Survey instrument packets were hand delivered or mailed to each participant using regular U.S. mail. Dillman’s Total Design Method (TDM) was used as a control strategy for getting back as many usable questionnaires as possible (controlling for non-response error). The packet included an instrument, an individually addressed cover letter, a self-addressed, stamped return envelope, and one serving of herbal tea. The self-addressed, stamped return envelope was included to satisfy the need to minimize the costs for responding. The herbal tea was included as a token of appreciation for responding. The reward was maximized by expressions of both verbal and written appreciation. The cover letter thanked the educators/trainers for participating, provided instructions for completing the instrument, and included a date to respond. A copy of the study results was offered to all participants desiring one. An attempt to establish trust was made by having the study identified with the Center on Education and Training for Employment (CETE) at The Ohio State University.

The response dates were five working days from the receipt date of each instrument. The initial distribution resulted in a 38% (n = 61) response rate. Follow-up letters were mailed or hand-delivered to all non-respondents two weeks following the first mailing. The follow-up distribution resulted in an additional 8% (n = 13) increase in response rate. Telephone calls were then made to all remaining non-respondents. The
response rate increased another 14% (n = 22) following the telephone follow-up calls. This resulted in an overall response rate of 60% (n = 96). A final letter expressing thanks, along with a summary of the results, was sent to all participants.

Non-responders were sent follow-up letters and also contacted by telephone. Control for non-response error was accomplished by a double-dip response effort. The non-respondents were listed and numbered. A 20% random sample was then drawn from the list. Attempts were then made to get responses for five survey items by telephone from the 20% of non-responders drawn. The five items were usage indicator, type of software used, highest degree earned, gender, and number of years teaching. Statistics from the respondent and the non-respondent pools were compared via cross-tabulations or t-tests to determine statistically significant differences between respondents and non-respondents. No statistically significant differences were noted for four of the five variables. The only statistically significant difference noted was regarding the level of usage for Microsoft PowerPoint software. Mean usage of the software by respondents was 2.75 (S.D. = 1.36) out of a possible 4.0; the mean usage by non-respondents (n = 13) was stated as 4.0 (S.D. = .00).

Data Analysis

Descriptive statistics were calculated on the collected data. The computer program, Statistical Program for the Social Sciences (SPSS) was used for data analysis. Frequency counts, percentages, modes, medians, means, and standard deviations were included in the reporting of results.
In Part I, *For what purpose and frequency is multimedia presentation software used in the delivery of education or training to adults* variable was described as a continuous variable. The data were ranked for frequency of use by purpose, and a mean rating for each purpose was calculated. The calculated means were used to describe the frequency of multimedia software usage, by purpose. The variability of the data was described by standard deviations.

In Part II, the variable, *Level and types of multimedia presentation software used*, was described as a continuous variable in terms of each type of selected software. *Level of use*, by software type, and a mean rating for usage of each software type was calculated. The variability of the nominal data was described by percentages of each type of multimedia presentation software used. The variability of *level of use* was described by standard deviations.

In Part III, the data related to the variable, *How multimedia presentation software package was learned*, was treated as nominal multichotomous and the mode was calculated for each descriptive item. Variability of the data was described by percent of cases in each category. *Learning preference* scores were tallied for both the business and the education populations at each educational institution included in the survey.

In Part IV, the variable, *Multimedia presentation software value*, was created by the summation of the mean scores of five items included in the survey instrument. The measure of central tendency for the interval data was by statistical mean. Variability of the data was described by standard deviations. The usage statements were described according to their perceived value to the educator/trainer.
In Part V, the variable, *Barriers/problems experienced when using multimedia presentation software*, was created by the summation of the mean scores of eleven items included in the survey instrument. The measure of central tendency for the interval data was by statistical mean. The variability of the data was described by standard deviations. The calculated means were used to describe the frequency in which the barrier/problem is encountered when using multimedia presentation software.

In Part VI, the *Highest educational degree* was tallied for education and business, by institution, and analyzed using percentages to show frequency of each degree within each category. The variable, *Year degree earned*, was analyzed as a continuous variable and the results stated as number of years since degree was earned. The variable, *Year of participation in a formal training course to learn how to use multimedia presentation software*, was analyzed as a continuous variable and the results stated as number of years since participation in a formal training course to learn how to use multimedia presentation software. The variable, *Employer-paid training*, was analyzed as nominal data using percentages to describe the results. The variables, *Software usage for which you were trained* and *Gender*, were analyzed as nominal data using percentages to describe the results.

The variable, *Age*, was analyzed as a continuous variable and used with the *Extent of multimedia presentation software use* variable to determine if differences in usage existed based on the age of the educator/trainer. The *Present position title* variable was analyzed as nominal data using percentages.
The variables, *Number of years of teaching experience at a university/college*, *Number of years of training experience in a business/industry setting*, and *Number of years of experience using multimedia presentation software* were all analyzed as continuous variables. The data were described using the median and range. Any relationship between each demographic characteristic of the adult educator/trainer and the frequency of use of the selected multimedia presentation software packages was noted. Responses to the open-ended question was analyzed through content analysis. Responses were reported in narrative description.
CHAPTER 4

FINDINGS

Overview

This study was conducted to determine the extent to which selected educators and trainers were using multimedia presentation software to deliver education and/or training to adults. Existing relationships among the software usage and selected demographic characteristics of respondents were also investigated. Barriers and problems encountered while using the software were identified.

Chapter 4 presents the results of the various analyses performed from the data collected in response to the research questions posed. The findings are summarized in seven sections. Purpose and frequency of multimedia presentation software usage are included in section one; level and types of multimedia presentation software are included in section two; how the software application was learned is delineated in section three; the perceived value of multimedia presentation software is included in section four; and barriers/problems encountered when using multimedia presentation software are included in section five. A description of the demographic data regarding the educators/trainers is summarized in section six, and other comments are summarized in section seven.

A survey questionnaire was sent to 160 full-time educators/trainers employed in the areas of business and education at the three selected institutions included in the target
population. The selected institutions were a private Baptist college in Cedarville, Ohio; a state-supported, predominately minority-student university in Wilberforce, Ohio; and a state-supported, predominately majority-student university in Fairborn, Ohio.

Return rates on mailed educational survey instruments are frequently in the 40% to 60% range (Gay, 1996). The results of this survey were determined from 60% (n = 96) of the survey population. All surveys returned were usable.

Following the initial mailing, responses from 61 (38%) of the 160 questionnaires were returned during the first two weeks of the survey period. Follow-up letters were then mailed to all non-respondents. During the next two weeks, an additional 13 (8%) of all surveys distributed were received. Telephone follow-up calls were then made to all who had still not responded (n = 86). Voice-mail messages were left whenever no direct contact was made. Twenty-two responses (14% of all surveys distributed) were received during the two-week period following the telephone follow-up calls. A non-respondent survey, which resulted in selected data being collected from 14 non-respondents, was then conducted. Data collected from non-respondents were limited to five variables: usage indicator, type of multimedia presentation software used, highest degree earned, gender, and number of years teaching at the college/university level. Differences in non-response data and data from respondents were investigated through the use of t-tests. No significant differences were noted for four of the five variables. The one difference noted was in the level of use of Microsoft PowerPoint noted as “very frequently” used (mean = 4.00) by all non-respondents surveyed by telephone. The level of usage of Microsoft
PowerPoint by respondents was 2.75 out of a possible 4.00. Overall response rate for the survey was 60% (n = 96). Survey distribution and return rates are summarized in Table 2.

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>% of total</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveys Distributed</td>
<td>160 (total)</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Early Respondents: before Second Letter</td>
<td>61 (sub-total) (returned)</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Late Respondents: after Second Letter but before Telephone Follow-up calls</td>
<td>13 (sub-total) (returned)</td>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>Respondents after Telephone Follow-up calls</td>
<td>22 (sub-total) (returned)</td>
<td>14</td>
<td>60</td>
</tr>
<tr>
<td>Total Surveys Returned</td>
<td>96</td>
<td>60 %</td>
<td>60%</td>
</tr>
</tbody>
</table>

Table 2: Survey Mailing and Follow-up Response Rates.

Purpose and Frequency

Research Question #1. For what purpose and frequency is multimedia presentation software used in the delivery of education or training to adults?

Respondents were asked to indicate levels of usage for selected purposes as follows; "0" for never used, "1" for rarely used, "2" for occasionally used, "3" for frequently used, and "4" for very frequently used.
More respondents indicated they never used multimedia presentation software to assist them in the development of professional articles (n = 45) than any other usage. More used the software to deliver education in a classroom setting than for any other purpose.

Frequencies for usage by specified purpose are shown in Figure 2.

Number of Respondents

From left to right, each bar in chart is a category rating V1, V2, V3, V4, and V5.

Legend: V1 (variable 1) to conduct training sessions.
V2 (variable 2) to deliver education.
V3 (variable 3) to assist in developing instruction.
V4 (variable 4) to generate independent assignments, and
V5 (variable 5) to assist in developing articles.

Figure 2: Usage and Frequency of Multimedia Presentation Software by Purpose
Of the 96 respondents, 25% (n = 24) indicated they had never used multimedia presentation software and 75% (n = 72) indicated they had used at least one multimedia software application program. The two highest frequencies of mean use were in the delivery of education (mean = 2.50) and in assisting in the development of instruction (mean = 1.76). The least frequent use was for assisting in the development of professional articles targeted toward adult use of the software. Table 3 shows the mean score ranking by purpose. A mean between: a) 0 - 1.5 indicates no to rare usage; b) 1.51 - 2.5 indicates occasional usage; c) 2.51 - 3.5 indicates frequent usage; and d) 3.51 - 4.0 indicates very frequent usage.

The highest mean usage by respondents was “occasional” when delivering education.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>To deliver education:</td>
<td>72</td>
<td>2.50</td>
<td>1.40</td>
</tr>
<tr>
<td>To assist in the development of instruction:</td>
<td>72</td>
<td>1.76</td>
<td>1.47</td>
</tr>
<tr>
<td>To generate on-line, web-based assignments</td>
<td>72</td>
<td>1.26</td>
<td>1.48</td>
</tr>
<tr>
<td>To conduct training sessions:</td>
<td>72</td>
<td>1.25</td>
<td>1.48</td>
</tr>
<tr>
<td>To assist in the development of professional articles:</td>
<td>70</td>
<td>.84</td>
<td>1.30</td>
</tr>
</tbody>
</table>

Table 3: Multimedia Presentation Software Usage by Purpose.
Fourteen respondents indicated they used multimedia presentation software for other purposes than those listed in Table 3. The other purposes were stated to be for research, student projects, and professional presentations. Table 4 shows the occasional, frequent, and very frequent usage of multimedia presentation software by purpose. A "2" denotes occasional usage; a "3" denotes frequent usage, and a "4" denotes very frequent usage.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>N</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>To deliver education</td>
<td>63</td>
<td>18</td>
<td>29</td>
<td>16</td>
<td>25</td>
<td>24</td>
<td>38</td>
</tr>
<tr>
<td>To assist in the development of instruction</td>
<td>34</td>
<td>11</td>
<td>32</td>
<td>15</td>
<td>44</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>To generate on-line, web-based assignments</td>
<td>34</td>
<td>7</td>
<td>21</td>
<td>12</td>
<td>35</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>To conduct training sessions</td>
<td>45</td>
<td>11</td>
<td>24</td>
<td>13</td>
<td>29</td>
<td>14</td>
<td>31</td>
</tr>
<tr>
<td>To assist in the development of professional articles</td>
<td>25</td>
<td>6</td>
<td>24</td>
<td>8</td>
<td>32</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 4: Frequency of Multimedia Presentation Software Usage by Purpose.

**Level and Types**

Research Question #2. What level and types of selected multimedia presentation software are being used to deliver education/training to adults?
Levels of usage indicators were: "0" for never used, "1" for rarely used, "2" for occasionally used, "3" for frequently used, and "4" for very frequently used. *Microsoft PowerPoint* (n = 72) was by far the software package most often used by educators/trainers who responded to the level and types of usage question from the sample population. Twenty-eight responders indicated they used *Microsoft PowerPoint* very frequently ("4") and 18 indicated they used it frequently ("3"). *Astound* was the next most often used multimedia presentation software package with 23 respondents indicating use. None of the 72 users of multimedia presentation software indicated having used *Dreamweaver*, *Flash*, or *Quest*. Otherwise, Shockwave had the lowest usage (n = 4) of the selected types listed in questionnaire.

Table 5 reflects rank order of mean usage by specified types of software.

Seven other types of software, not included in Table 5, were reflected in item 15, "Other." None of the written-in types were mentioned more than two times except for *Corel Presentations®,* which was indicated five times. The other types included *Apple Works®, Front Page®, Hyper Studio®, Photo Shop®, Hot Dog®,* and special purpose software. Each software package listed in Table 5 could have had a mean ranging from 0 - 4. No use was indicated by a "0" and very frequent use was indicated by a "4".
<table>
<thead>
<tr>
<th>Software Package</th>
<th>Never Used</th>
<th>(Usage)</th>
<th>Very Frequently Used</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>1. <em>Microsoft PowerPoint</em></td>
<td>9</td>
<td>5</td>
<td>12</td>
<td>18</td>
<td>28</td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>2. <em>Astound</em></td>
<td>41</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.32</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>3. <em>Topclass</em></td>
<td>51</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>4. <em>Quicktime</em></td>
<td>50</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>.52</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1.16</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>5. <em>Toolbook</em></td>
<td>50</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>6. <em>Real Media</em></td>
<td>54</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>.35</td>
</tr>
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<td></td>
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<td></td>
<td></td>
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<td>.92</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>7. <em>Podium</em></td>
<td>58</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>.28</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>.95</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>8. <em>Web CT</em></td>
<td>56</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>.29</td>
</tr>
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<td>.89</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>9. <em>Authorware Professional</em></td>
<td>57</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>.22</td>
</tr>
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<td></td>
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<td></td>
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<td>.68</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>10. <em>Lotus Learning Space</em></td>
<td>59</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>.63</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>11. <em>Shockwave</em></td>
<td>58</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>.15</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>.60</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>12. <em>Dreamweaver</em></td>
<td>62</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.00</td>
</tr>
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<td></td>
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<td>.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>13. <em>Flash</em></td>
<td>62</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.00</td>
</tr>
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<td></td>
<td>.00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>14. <em>Quest</em></td>
<td>62</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>.00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>61</td>
</tr>
</tbody>
</table>

Table 5: Level and Types of Multimedia Presentation Software Usage

Note: Mean scores are based on five-point Likert-type scale, 0 - 4, with "0" indicating no usage, "1" = rarely use, "2" = occasional use, "3" = frequent use, and "4" indicating very frequent usage.

How Software Was Learned

Research Question #3. How did the educator/trainer learn to use multimedia presentation software?
Four methods for learning multimedia presentation software were provided as choices to respondents when answering this research question. The methods were (a) attended one or more formal training sessions, (b) took a formal course at an institution of higher learning, (c) participated in on-the-job training, and (d) taught self. Respondents were asked to rank methods by using "1" for the most significant method used, and if applicable, "2" for next most significant method used, "3" for next to the least significant method used, and "4" for the least significant method used.

Of the 72 respondents who indicated they used multimedia presentation software, most of the educator/trainers indicated their most frequent method for learning multimedia presentation software by entering a "1" for "taught self via self-study, practice, manual, CBT (CD-ROM), or video" (n = 62). The next most frequent method for learning the software by respondents was indicated by entering a "2" by the method. The next most frequent method was through "attending one or more formal training sessions designed to help users learn the software" (n = 56). The lowest ranked method for learning the software was "took a formal course" (n = 44). The ranking for the methods 1, 2, and 3 used are shown in Table 6. As indicated in the table, the most frequently mentioned method for learning how to use the software was "taught themselves."
### Table 6. Method for Learning Software

<table>
<thead>
<tr>
<th>Method for Learning Software (Ranked from 1 to 4)</th>
<th>N</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Taught themselves</td>
<td>62</td>
<td>37</td>
<td>60</td>
<td>10</td>
<td>16</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>2. Took formal training classes</td>
<td>56</td>
<td>19</td>
<td>34</td>
<td>17</td>
<td>30</td>
<td>15</td>
<td>27</td>
</tr>
<tr>
<td>3. Participated in on-the-job training</td>
<td>49</td>
<td>6</td>
<td>12</td>
<td>23</td>
<td>47</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>1. Took a formal course</td>
<td>44</td>
<td>5</td>
<td>11</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>14</td>
</tr>
</tbody>
</table>

**How Valuable Software is to Respondent**

Research Question #4. How valuable is the use of multimedia presentation software when delivering education/training to adult learners, as perceived by adult educators/trainers?

Respondents were asked to indicate how valuable the software was to them in performing specified aspects of their job. The selected purposes were: a) teaching adult learners in a formal classroom setting, b) conducting training sessions in a business or industry setting, c) making professional presentations, d) developing instruction, and e) accessing materials on the Internet. Respondents were asked to indicate the value for selected purposes as
follows; "0" for not at all valuable, "1" for very limited value, "2" for somewhat valuable, and "3" for very valuable. Of the 72 respondents who indicated they used multimedia presentation software, most respondents considered the use of multimedia presentation software to be the most valuable for making professional presentations. The next most valuable usage was indicated as teaching adult learners in a formal classroom setting. The least valuable usage was considered to be in conducting training sessions. Table 7 shows the frequency of perceived value of multimedia presentation software usage for the selected purposes listed.

<table>
<thead>
<tr>
<th>Purposes</th>
<th>Not at all Valuable</th>
<th>Very Limited Value</th>
<th>Somewhat Valuable</th>
<th>Very Valuable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>freq %</td>
<td>freq %</td>
<td>freq %</td>
<td>freq %</td>
</tr>
<tr>
<td>Making Professional Presentations</td>
<td>9 13</td>
<td>3 4</td>
<td>16 22</td>
<td>44 61</td>
</tr>
<tr>
<td>Teaching Adult Learners in a Formal Classroom Setting</td>
<td>6 8</td>
<td>7 10</td>
<td>25 35</td>
<td>34 47</td>
</tr>
<tr>
<td>Developing Instruction</td>
<td>6 8</td>
<td>8 11</td>
<td>24 33</td>
<td>33 46</td>
</tr>
<tr>
<td>Accessing Materials on Internet</td>
<td>39 41</td>
<td>13 14</td>
<td>17 25</td>
<td>27 28</td>
</tr>
<tr>
<td>Conducting Training Sessions in a Business/Industry Setting</td>
<td>20 28</td>
<td>8 11</td>
<td>14 19</td>
<td>23 40</td>
</tr>
</tbody>
</table>

Table 7. Value of Software to Educators/Trainers by Selected Purpose
Barriers and Problems

Research Question #5. What barriers/problems are encountered by educators and trainers when using multimedia presentation software?

Eleven barriers/problems encountered when using multimedia presentation software were provided as choices to respondents when answering this research question. The choices were (a) technology not available in classroom or training room, (b) hardware malfunction, (c) software not working properly, (d) server down-time, (e) system timed out, (f) computer response too slow, (g) equipment already in use by someone else, (h) equipment not available in classroom, (i) set-up time too lengthy, (k) lack of knowledge of hardware, and (l) lack of resources. Respondents were asked to circle the appropriate number on a scale of 0 - 4 for each barrier/problem presented. A "0" indicated the selected barrier/problem was never a barrier or problem during their usage of multimedia presentation software; "1" = seldom a barrier; "2" = sometimes a barrier; "3" = often a barrier; and "4" = always a barrier.

The barriers/problems considered to be deterrents to more frequent usage of multimedia presentation software can be seen in Table 8. "Technology not available in the classroom" (mean = 2.11) was the barrier/problem most often encountered by respondents. Respondents considered "system timed-out" (mean = 1.21) the barrier least often encountered which deterred respondents from using multimedia presentation software more often.

Table 8 shows the means by rank order, standard deviations and number of respondents for each barrier/problem. A mean of "0" would indicate the item was never a
barrier/problem and a mean of "4" indicated the item was always a barrier/problem. The top three barriers or problems most often encountered by respondents when using multimedia presentation software were: (1) technology not available in room, (2) hardware malfunction, and (3) equipment not available in room.

<table>
<thead>
<tr>
<th>Barrier/Problem</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology not Available in Classroom</td>
<td>70</td>
<td>2.11</td>
<td>1.15</td>
</tr>
<tr>
<td>2. Hardware Malfunction</td>
<td>70</td>
<td>1.96</td>
<td>.88</td>
</tr>
<tr>
<td>3. Equipment not Available in Room</td>
<td>69</td>
<td>1.93</td>
<td>1.24</td>
</tr>
<tr>
<td>4. Computer Response too Slow</td>
<td>71</td>
<td>1.79</td>
<td>1.17</td>
</tr>
<tr>
<td>5. Software not Working Properly</td>
<td>70</td>
<td>1.74</td>
<td>.96</td>
</tr>
<tr>
<td>6. Lack of Resources</td>
<td>68</td>
<td>1.69</td>
<td>1.28</td>
</tr>
<tr>
<td>7. Set-up Time Too Lengthy</td>
<td>71</td>
<td>1.62</td>
<td>1.21</td>
</tr>
<tr>
<td>8. Server Down-time</td>
<td>69</td>
<td>1.62</td>
<td>1.10</td>
</tr>
<tr>
<td>9. Equipment Already in Use</td>
<td>69</td>
<td>1.38</td>
<td>1.16</td>
</tr>
<tr>
<td>10. Lack of Knowledge of Hardware</td>
<td>71</td>
<td>1.34</td>
<td>1.21</td>
</tr>
<tr>
<td>11. System Timed-out</td>
<td>67</td>
<td>1.21</td>
<td>1.09</td>
</tr>
</tbody>
</table>

Table 8: Barriers and Problems when Using Multimedia Presentation Software

Note: Mean scores are based on a scale of 0 - 4 with "0" = never a barrier, "1" = seldom a barrier, "2" = sometimes a barrier, and "3" = often a barrier, and "4" = always a barrier.
Other barriers and problems which prevented responders from using multimedia presentation software more often were identified under item 12 "Other." The "other" barriers and problems included: (a) too much material to learn to become proficient in using the software, (b) lack of professional training to stay current with the newer versions of software, (c) poor projection from equipment currently in classroom, (d) and multimedia presentation software programs are too complex.

**Demographic Data**

Research Question #6. What are the demographic characteristics of the adult educator/trainer in terms of (a) highest degree earned, (b) year degree was earned, (c) year of participation in a formal training course/session to learn how to use multimedia presentation software, (d) whether or not employer paid for the training, (e) whether educator/trainer uses the software for which he/she was trained, (f) gender, (g) age, (h) position title, number of years educator/trainer has teaching at a university/college, (i) number of years educator/trainer has conducted training sessions in a business/industry setting, and (k) number of years of experience educator/trainer has using multimedia presentation software? Demographic data were collected in terms of highest degree earned, year highest degree was earned, year of last participation in a formal training session, funding of training by employer, current use of the software, gender, age, position title ranking, number of years in teaching profession, number of training sessions conducted during the last two years, and number of years using multimedia presentation software.
Of the 96 respondents, 27% (n = 26) indicated the Master’s degree as their highest degree held; 66% (n = 63) held Ph.D. degrees, and 7% (n = 7) held professional degrees. Fifty percent (n = 10) of the respondents at Cedarville College held Ph.D. degrees; 55% (n = 16) of the respondents at Central State University held Ph.D. degrees; and 78% (n = 37) of the respondents at Wright State University held Ph.D. degrees. The range of years for earning the highest degree was from 1964 to 1999. Table 9 shows the degrees held by respondents at each of the institutions in the population. The “n” in Table 9 indicates the respondent population within institutions.

<table>
<thead>
<tr>
<th>Institution</th>
<th>n</th>
<th>Master’s Degree</th>
<th>Ph.D.</th>
<th>Professional Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedarville College</td>
<td>20</td>
<td>7</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Central State University</td>
<td>29</td>
<td>11</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Wright State University</td>
<td>47</td>
<td>8</td>
<td>37</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>26</td>
<td>63</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 9: Educational Degrees of Respondents by Institution

Of the 96 respondents, 36 indicated they had never participated in a formal multimedia presentation software training course, and 60 indicated they had received training. Of the 60 receiving training, 15% (n = 9) participated in a formal training course
to learn how to use multimedia software in 1999; 37% \( (n = 22) \) in 1998; 13% \( (n = 8) \) in 1997; and 35% \( (n = 21) \) participated in the training in 1996 or earlier.

Most employers paid for training received by respondents. Of the 60 receiving training, 83% \( (n = 50) \) indicated that their employer had paid the full cost of the training; an additional 10% \( (n = 6) \) indicated that their employer had paid part of the cost of the training; and 7% \( (n = 4) \) indicated that their employer did not pay any of the cost of the training.

Of the 60 individuals receiving training, 30% \( (n = 18) \) indicated they do not use the software for which they were trained. Seventy percent \( (n = 42) \) use the software for which they were trained.

Table 10 shows that of the 96 respondents, 60% \( (n = 58) \) were male and 40% \( (n = 38) \) were female, also. Percentages of males and females of the entire population for each institution are also shown in Table 10.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Male n</th>
<th>% of School</th>
<th>Female n</th>
<th>% of School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedarville College</td>
<td>12</td>
<td>60</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Central State University</td>
<td>19</td>
<td>58</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Wright State University</td>
<td>27</td>
<td>57</td>
<td>20</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10: Gender of Respondents
Of the 96 respondents, the youngest indicated he/she was 34 years old and the oldest indicated he/she was 74 years old. The mean age was 52 years.

Most (34%) of the educator/trainers held the title of Assistant Professor (n = 32). Two percent (n = 2) were Instructors; 31% (n = 30) were Associate Professors; 26% (n = 25) were Professors; and 7% (n = 7) indicated Lecturer or a professional title as their position title. For the purpose of presenting the data, respondents reporting the title of Lecturer, Instructor, or a professional title were grouped together with the Assistant Professors and shown as entry-level educators (n = 41). Associate Professors and Full Professors were grouped together and shown as professors (n = 55). Results of an Anova “F” test showed no statistically significant difference between the two groups. Table 11 shows there were more users (n = 43 + 29) of multimedia presentation software usage among respondents than non-users (n = 15 + 9).

<table>
<thead>
<tr>
<th></th>
<th>Professors Users</th>
<th>Non-Users</th>
<th>Entry-Level Educators Users</th>
<th>Non-Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedarville College</td>
<td>11</td>
<td>1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Central State University</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Wright State University</td>
<td>21</td>
<td>6</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>15</td>
<td>29</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 11: Multimedia Presentation Software Usage within Institution
The maximum number of years of teaching experience by one educator/trainer was 45; the minimum number was one. The mean number of years is 10.8. Table 12 is a tabulation of the number of years of teaching experience each respondent has at the university/college level.

<table>
<thead>
<tr>
<th>Number of Years Teaching</th>
<th>Educator/Trainer n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>14</td>
</tr>
<tr>
<td>6 - 10</td>
<td>20</td>
</tr>
<tr>
<td>11 - 15</td>
<td>13</td>
</tr>
<tr>
<td>16 - 20</td>
<td>14</td>
</tr>
<tr>
<td>21 - 25</td>
<td>10</td>
</tr>
<tr>
<td>26 - 30</td>
<td>10</td>
</tr>
<tr>
<td>31 - 35</td>
<td>3</td>
</tr>
<tr>
<td>36 or more</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 12: Years of teaching.
Mean = 10.8  S.D. = 9.56  Min = 1  Max = 45

Of the 96 respondents, 63% (n = 60) do not conduct training sessions. Of the 37% (n = 36) who conduct training sessions, the highest number conducted by one educator/trainer during the past two years was 60 sessions. The least number conducted
was one. More educators/trainers conducted between one to ten sessions during the last two years. Table 13 shows the number of training sessions conducted by respondents.

<table>
<thead>
<tr>
<th>Number of Training Sessions Conducted</th>
<th>Educator/Trainers n</th>
<th>Educator/Trainers %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (no training session)</td>
<td>60</td>
<td>63</td>
</tr>
<tr>
<td>1 - 10</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>11 - 20</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>21 - 30</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>31 or more</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 13. Frequency of training sessions conducted during last two years.

Twenty-five percent (n = 24) of the educator/trainers indicated they had no years of experience using multimedia presentation software. Of those who use the software (n = 72), 57% (n = 41) had between one and three years of experience. Only two users had more than 10 years of experience using multimedia software. The mean years of usage was 8.32, the median was 4.60, and the mode was 3 years. Most respondents had between one to three years of experience using the software. Table 14 shows the years of experience respondents indicated for using multimedia presentation software.
Table 14. Years of experience using multimedia presentation software (N = 96)

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Educators/Trainers n</th>
<th>Educators/Trainers % of users</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (no experience)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>1 - 3</td>
<td>41</td>
<td>57</td>
</tr>
<tr>
<td>4 - 6</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>7 - 9</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>10 or more</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td></td>
</tr>
</tbody>
</table>

Relationships

Research Question #7. Do relationships exist between any of the demographic characteristics of the adult educators/trainers and the frequency of selected multimedia presentation software usage? A mean overall multimedia presentation software usage score of 8.15 was calculated and compared using data from variables “age,” “gender,” “position title,” “area of employment,” and “participation in formal training.” The range for overall usage was 0 - 24. A total of six usage items was included. No usage was indicated by a “0” and very frequent usage was indicated by a “4”. When correlating age,
the resulting negative association \( r = -0.80, p = .001 \) for the population of 96 respondents suggests that the older the educator, the less likely he or she is to use multimedia presentation software.

The overall percentage of usage by female respondents exceeded the overall usage by males. The mean for male users was 6.60 with a standard deviation of 5.56. The mean for female users was 9.97 with a standard deviation of 5.58. Analysis of variance results \( (F = 5.09, p = .03) \) showed a significant difference between male and female users of multimedia presentation software. These findings indicate that females within the survey population are more likely to use multimedia presentation software than males. Table 15 shows the overall usage of multimedia presentation software by gender.

Cross-tabulations or correlations were run on the variables “overall usage of multimedia presentation software” and “position title.” In the entire population \( (n = 96) \), nine individuals indicated they were Instructors, Juris Doctorates, or Lecturers. For the purpose of presenting the data, the respondents reporting these titles and who also used the software, were grouped together with the Assistant Professors \( (n = 32) \) and shown as Entry-level Educators. The Associate Professors and Full Professors were grouped together and shown as Professors \( (n = 40) \). Grouped in this manner, the Entry-level Educators \( (n = 32) \) had a higher mean usage of multimedia presentation software \( (\text{mean} = 8.63) \) than the Professors \( (\text{mean} = 7.39) \) who outnumbered the Entry-level Educators (Instructors, Juris Doctorates, Lecturers, and Assistant Professors). No significant statistical differences were noted between means based on the “F” test. Means and standard deviations for Entry-level Educators and Professors are shown in Table 15.
An analysis of the respondents who indicated use of multimedia presentation software \( (n = 72) \) within the areas of education and business was accomplished. The data reflected a statistical difference in usage of the software by those working in the area of Education \( (n = 37, \text{mean} = 9.57) \) compared to those respondents working in the area of Business \( (n = 35, \text{mean} = 6.27) \). The means and standard deviations for overall multimedia presentation software usage within area of employment are shown in Table 15.

Of the 72 users of multimedia presentation software, more respondents participated in formal training \( (n = 52) \) compared to those not receiving formal training \( (n = 19) \). One of the 72 users did not enter a response for this question, as a result, a frequency total of 71 is reflected in Table 15 for formal training. The Anova “F” test \( (F = 5.36, p = .03) \) showed a statistical difference between those respondents who used multimedia presentation software, and also received formal training on the software, and those who used multimedia presentation software but did not receive formal training on the software.

The means and standard deviations of overall multimedia presentation software usage for those respondents who received formal training on how to use the software are reflected in Table 15. Mean scores relating to overall usage could range from 0 to 24.

Overall mean usage of: 5 - 9 indicates rare usage, 10 - 14 indicates occasional usage, 15 - 19 indicates frequent usage, and 20 - 24 indicates very frequent usage. Mean usage in all categories included in Table 15 were 9.97 or lower which indicates that even though educators/trainers are using multimedia presentation software, the level of usage is rare to occasional.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>mean</th>
<th>SD</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender:</td>
<td>Males</td>
<td>44</td>
<td>6.60</td>
<td>5.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>29</td>
<td>9.97</td>
<td>5.58</td>
<td>5.09</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position Title:</td>
<td>Professors</td>
<td>40</td>
<td>7.39</td>
<td>5.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Entry-level) Educators</td>
<td>32</td>
<td>8.63</td>
<td>6.21</td>
<td>1.50</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of Employment:</td>
<td>Business</td>
<td>35</td>
<td>6.27</td>
<td>4.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>37</td>
<td>9.57</td>
<td>6.73</td>
<td>8.76</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Formal Training:</td>
<td>Yes</td>
<td>52</td>
<td>9.09</td>
<td>5.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19</td>
<td>5.58</td>
<td>5.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>71</td>
<td></td>
<td></td>
<td>5.36</td>
<td>.03</td>
</tr>
</tbody>
</table>

Table 15: Overall Use of Multimedia Presentation Software by Educator/Trainers

Note: Mean scores could range from 0 to 24, with a higher score indicating a higher level of overall usage of the software.
Correlations were accomplished using the "number of years teaching" and "number of training sessions conducted" with "overall usage of the software". No meaningful correlations were found even though significant differences in level of usage were noted. The findings suggest that although differences in levels of usage were greater for individual purposes, no relationships between the items being correlated and overall usage were found.

Comments

Of the 96 respondents, 31% (n = 30) provided a wide range of comments relating to usage of multimedia presentation software. Many of them gave information relating to why they did not use multimedia presentation software to a greater extent. Other comments were suggestions on how to better use the software. The remaining comments were of a general nature. One of the recurring themes was the lack of resources for increased usage of the software. Based on the nature of the comments, it seems that some educators/trainers do not believe the benefits of using multimedia presentation software actually outweigh the costs. In cases where the educators/trainers believe that using multimedia presentation software has sufficient merit, there are too many non-learning tasks competing for their time and attention which prevent the educators/trainers from using multimedia presentation software too a greater extent. The actual comments are included in Appendix F.
CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this descriptive-correlational study was to investigate and describe the types and levels of use of selected multimedia presentation software among educators/trainers employed in the areas of business and education at Cedarville College, Cedarville, Ohio; Central State University, Wilberforce, Ohio; and Wright State University, Fairborn, Ohio. In the literature review, there was evidence that multimedia presentation software usage could:

a) increase audience retention of information from one to 38%,
b) reduce a meeting’s time by up to 40%,
c) enrich training and educational programs,
d) introduce students to technology which could be helpful to them after entering the workforce, and
e) engender a new approach and attitude among students and workers which could help them to become more responsible and more autonomous learners rather than simply seekers of traditional knowledge from lecturers.

When educators/trainers become aware of these potential benefits, it seems plausible that more of them would want to interweave multimedia presentation software
usage into their education and training processes. Yet, it seems that their becoming aware of the benefits does not necessarily cause them to act on their knowing. That could be because they are not fully convinced that the benefits outweigh the costs. It could also be because the educators/trainers have too many other non-learning tasks competing for their time and attention. As a result, significant gains in the level of multimedia presentation software usage are not readily apparent within educational processes.

Some non-usage of the software can be explained by the barriers and problems encountered when using the software. Barriers/problems encountered by respondent educators/trainers when using multimedia software to deliver education or training to adult learners were also examined in this study. A mail survey was conducted to answer the following research questions:

1. For what purpose and frequency is multimedia presentation software being used in the delivery of education or training to adults?
2. What level and types of selected multimedia presentation software are being used to deliver education/training to adults?
3. How did the educator/trainer learn to use multimedia presentation software?
4. How valuable is the use of multimedia presentation software when delivering education/training to adult learners, as perceived by adult educators/trainers?
5. What barriers/problems are encountered by educators and trainers when using multimedia presentation software?
6. What are the demographic characteristics of the adult educator/trainer in terms of (a) highest degree earned, (b) the year degree was earned, (c) the year of
participation in a formal training course to learn how to use multimedia presentation software, (d) whether employer paid for the training, (e) whether educator/trainer uses the software for which he/she was trained, (f) gender, (g) age, (h) position title, (i) number of years educator/trainer has teaching at a university/college, (j) number of years educator/trainer has conducted training sessions in a business/industry setting, and (k) number of years of experience educator/trainer has using multimedia presentation software?

7. Do relationships exist between any of the demographic characteristics of the adult educators/trainers and the frequency of selected multimedia presentation software?

Chapter 5 presents the results of the various analyses performed on the responses to the research questions from the data collected during the mail survey. The findings are summarized in four sections. A summary of the study is located in Section 1; a summary of the findings is included in Section 2; conclusions and recommendations are included in Section 3; and selected items with a need for further study are included in Section 4.

Summary of Study

The instrument used in the mail survey was evaluated and validated by a panel of experts, three of the panel members were experts in the use of multimedia presentation software technology; two were experts in delivering education and/or training to adults; and one was an expert in conducting surveys. The instrument was also field tested to further establish validity and to evaluate clarity, wording, format, and ease-of-use. The field test was conducted using six faculty members at other institutions who were similar
to the target population. Instructions were provided to the field test participants to first
review the survey questionnaire, then provide a response to the questions on the
instrument. A meeting was held to discuss possible modifications to the instrument
following the completion of the six instruments. Only minor editorial changes were
suggested by the expert panel and field test group. The questionnaire was modified using
the feedback obtained from the participants in both the expert panel and field test.

A pilot test was next conducted to establish reliability of the instrument. Twenty-
five faculty members, similar to the target population and not participating in any other
phase of the data collection, were invited to participate in the pilot test. Of the 25 who
were invited to participate, 17 completed and returned the first test questionnaire. Of the
17 who returned the first test questionnaire, 15 returned the retest questionnaire, resulting
in a 60% response rate (r = .98, p < .05). As a result, no additional changes were made
to the survey instrument.

The census survey was conducted by mail (n = 160). The survey resulted in 96
respondents, once all follow-up contacts had been made. A non-respondent survey was
conducted by telephone (n = 13) and correlated with five data variables collected from
respondents. Data collected from the non-responders were: a) usage of multimedia
presentation software indicator, b) type of multimedia presentation software used, c)
highest degree earned, d) gender, and e) number of years teaching at the college/university
level. Non-respondents indicated a more frequent level of usage of Microsoft PowerPoint
than did the respondents from the regular survey. Except for this difference in usage,
there were no other statistically significant differences in responses from respondents in
the regular survey and respondents in the non-respondent survey relating to the five
selected variables at the .05 level. The interpretation is that non-respondents, surveyed by
telephone, indicated they used *Microsoft PowerPoint* very frequently compared to
respondent usage which ranged from occasional to frequent usage.

**Summary of Findings**

Data collected during the survey showed that 75% of the educators/trainers
(n = 72) in the survey population were using multimedia presentation software. The
frequency of the software usage varied by specified purpose. The data showed that of
those who were using the software, most were using it to deliver education. Most
educators/trainers were also using the software to assist them in developing instruction,
even though the level of usage was low. Forty-eight percent (n = 46) of the respondents
conducted training sessions. Of those who conducted training sessions, most indicated
they used multimedia presentation software during the conduct of the sessions. Study
findings indicated that educators/trainers were using multimedia presentation software the
least for assisting in the development of professional articles.

Of the respondents who used multimedia presentation software, most indicated
occasional, frequent, or very frequent use of *Microsoft PowerPoint* (mean usage = 2.75).
The more frequent use of *Microsoft PowerPoint* could have been because it has been a
part of *Microsoft Office* in the past. Typically, *Microsoft Office* was pre-loaded on
personal computers used by educators in the survey population. Therefore, it was
probably more convenient to access than other packages which were only rarely used.
Other selected software package choices in descending order of “rare” usage included:
Astound, Topclass, Quicktime, Toolbook, Real Media, Podium, Web CT, Authorware Professional, Lotus Learning Space, and Shockwave. None of the respondents indicated use of Dreamweaver, Flash or Quest. Corel Presentations was the most often used package entered as “other” multimedia presentation software used.

Sixty-five percent (n = 62) of the survey respondents taught themselves how to use multimedia presentation software. This could be because educators/trainers frequently need to present very content-specific presentations, so it becomes necessary to learn how to tailor general knowledge and skills relating to the use of a software package to specific usage through ‘trial and error’ methods on one’s own. Nearly as many (n = 56) participated in a formal training session designed to help users learn the software. Training courses are generally meant to serve as vehicles for introducing the use of a software package and are not intended to necessarily provide the recipient of the training with sufficient knowledge and skills to move him/her to a comfortable level of usage. It seems fair to say that some amount of self teaching would be an expected follow-on method after receiving training on a software package. Taking a course at an institution of higher learning was the least mentioned method for learning the software. This could be because educators tend to share knowledge and skills among each other in informal user groups without enrolling in formal courses. This provision decreases the need to actually enroll in a formal class.

Of the respondents who use multimedia presentation software, most thought the software was the most valuable to them when using it to make professional presentations. The next most valuable usages were teaching adult learners in a formal classroom setting
and developing instruction. The least valuable purpose was for conducting training
sessions in a business or industry setting. It is often difficult to accurately access the
environment in which training sessions are to be conducted. The lighting may not be
conducive for using multimedia presentation software with a projector or the room may
not be barrier-free in terms of the barriers most often encountered when using multimedia
presentation software. This may partially explain why educators/trainers in the survey
population did not consider the use of multimedia presentation software very valuable to
them. They may have been reluctant to use multimedia presentation software for training
purposes simply because they did not want to be faced with surprises when conducting
training sessions in unfamiliar environments.

In descending order, technology not available in classroom, hardware malfunction,
equipment not available in room, computer response too slow, and software not working
properly were the barriers and problems most often encountered that impeded greater use
of multimedia presentation software by respondents. Lack of resources, lengthy set-up
time, server down-time, lack of knowledge of hardware, equipment already in use, and
system timed-out were perceived to be barriers/problems less often encountered. It seems
reasonable to expect less usage of multimedia presentation software when routinely faced
with these barriers.

Regarding the demographic data of the respondents, 66% of the respondents
(n = 63) held doctorate degrees. Thirty-six percent (n = 35) of the respondents had never
participated in a formal training course designed for learning how to use multimedia
presentation software. Of the 64% (n = 61) who did participate in a training course, 84%
(n = 51) indicated that their employer had paid the full cost of the training. Seventy-five percent (n = 46) of the respondents who participated in a training course currently use the software for which they were trained. The majority of the respondents who participated in a training course, but did not use the software for which they were trained were not new to the profession. They were all experienced educators/trainers.

The gender of the respondents was 60% male (n = 58) and 40% (n = 38) female. In the survey population (n = 160), 60% were male and 40% were female, also. Multimedia presentation software usage by females exceeded usage by males. This could be because more females were newer to teaching at the college or university level than males. As such, they may have had more exposure to tools such as multimedia in courses taken more recently than males.

The age of the respondents ranged from 34 to 74 years old. The mean age was 51.72. There was a negative association between the age of the respondent and his/her level of overall multimedia presentation software usage (r = -0.80, p = .001). This could be because younger respondents were more likely to be exposed to multimedia presentation software usage as part of their course work than older respondents.

Thirty-four percent (n = 32) of the respondents held the title of Assistant Professor. Thirty-one percent (n = 30) held the title of Associate Professor and 26% (n = 25) held the title of Professor. The fewest percentage (7%) held titles not listed; such as Lecturer and professional titles.

The mean number of years of teaching experience at the university/college level was 10.8 for respondents. Sixty percent of the respondents had not conducted a training
session during the last two years. Of the 40% who had conducted training sessions, the fewest number conducted was one and the most conducted was 60. Two trainers indicated they conducted more than 30 sessions during the last two years.

One user of multimedia presentation software had more than 10 years of experience using the software. Fifty-nine percent of the users had between one and three years of experience. The mean years of usage was 8.32.

Conclusions and Recommendations

Based on the literature, adult learning theory recognizes that adults tend to center their learning around tasks they deem important and may not show much interest in investing their time or energies on matters that seem to be non-essential. Could it be that educators/trainers would investigate the benefits of using multimedia presentation software to a greater degree if they were convinced that it’s usage really reduced a meeting’s time by up to 40% and had the potential to increase audience retention of information by as much as 38% (Keyes, 1994)? Perhaps more attention should be placed on educating educators/trainers regarding what benefits are derived from the usage of multimedia presentation software.

The survey findings suggest that educators and trainers are using multimedia presentation software at a low level in the conduct of their jobs. However, not much documentation in the literature can be found to support these results. The results of this study provide human resource professionals additional information for planning for and enhancing training effectiveness. The results also provide educators information for enhancing their delivery of education. Information for planning future training
interventions and workshops is provided for use by individuals involved in faculty development, as well. Researchers should gather additional data on those who impact and are impacted by the use of multimedia presentation software.

A number of recommendations can be made based upon the results of this study. These recommendations can provide direction for educators, trainers, and researchers to enhance their usage of multimedia presentation software. They include recommendations to: a) conduct further investigations regarding the extent multimedia presentation software usage influences specific student learning, b) explore gender and race usage more fully, and c) collect more data that provides evidence that multimedia presentation software usage impacts teaching and learning environments in a positive manner.

Analyses within their respective workplaces need to be conducted to specifically determine how multimedia presentation software can be more useful to educators and trainers. Following the analyses, more attention needs to be given to overcoming barriers that impede multimedia presentation software usage. More financial resources need to be allotted for providing hardware and software that support increased usage of multimedia presentation software in the classroom and in the training room. Based on comments from respondents, there is also a need for more technical support. This support is especially needed in the set-up and operation of equipment in the classroom and/or training room.

It is recommended that the scope of this study be expanded. Educators and trainers should become more involved in an assessment process that results in a better understanding and appreciation for using tools which appeal to more than one learning modality. Once the resulting analyses have been accomplished, more effective training
interventions can then be scheduled for those who deliver education and training to adults.

When these kinds of analyses are considered, organizations and individuals can make better decisions regarding how to improve their delivery of education and training to adults. If the known barriers and problems which impede greater usage of multimedia presentation software are effectively reduced or eliminated, multimedia presentation software usage could play an even more important role in addressing training and educational challenges during the new millennium.

Need for Further Study

The results of this study of learning could provide the basis for further research in institutions where the use of multimedia presentation software in the classroom or training room is a requirement. Because of growing concerns relating to diversity and learning, there is a need to explore more about how race and gender could/could not impact the usage of multimedia presentation software. More research is needed regarding how multimedia presentation software usage can enrich the overall teaching/learning process and how the use of multimedia presentation software specifically contributes to autonomous learning among adults. This study needs to be replicated to a larger population to learn if the level of multimedia presentation software usage is consistent in other environments. Clearly, more data are needed to be used as a base for developing a better understanding of a) when multimedia presentation software usage has the potential for producing maximum benefits for learners and b) how educators/trainers can facilitate the increase of audience retention of information and thus, increase learning by adults.
APPENDIX A

SURVEY INSTRUMENT
MULTIMEDIA PRESENTATION SOFTWARE USAGE
IN
THE DELIVERY OF EDUCATION AND TRAINING
TO
ADULT LEARNERS

Research
by
Reva Hutchins, Ph.D. Candidate
Center on Education and Training for Employment
The Ohio State University
Columbus, Ohio
Dear Educator,

The purpose of this study is to describe the level of use for selected types of multimedia presentation software among educators and trainers employed at Cedarville College, Cedarville, Ohio; Central State University, Wilberforce, Ohio; and Wright State University, Fairborn, Ohio. The study will answer research questions relating to the extent multimedia presentation software is used by educators/trainers in the delivery of education or training to adults.

For the purpose of this study, *multimedia presentation software is defined as a computer application that has the capability to produce an electronic slide presentation which may include any combination of text, sound, video, graphics, and animation*. An adult learner is defined as an individual who is either 1) participating in post-secondary education at a college or university to gain knowledge or skills, or 2) participating in formal training for the purpose of improving performance on a job currently held.

You have been selected as a respondent because you are employed as a full-time educator or trainer in either business or education at one of the three selected educational institutions. Your input will contribute significantly to the usefulness of this study, therefore your participation is very important and will be greatly appreciated. The entire questionnaire can be completed in about 15 minutes.

Please complete and return the survey in the enclosed envelope within five (5) working days. The questionnaire is divided into seven parts. Each part has a brief statement(s) regarding the method of response expected for that part. Please read the instructions carefully before entering your response.

Thank you
PART I. For what purpose and frequency is multimedia presentation software used in the delivery of education or training to adults?

Instructions: Multimedia presentation software is defined as a computer application that has the capability to produce an electronic slide presentation which may include any combination of text, sound, video, graphics, and animation. Please indicate, by circling the appropriate number, the purpose for which you believe the following statements describe how you use multimedia presentation software. If you do not use multimedia presentation software, check here and skip to PART VI.

**KEY**

0 = I Never Use Multimedia Presentation Software for this purpose
1 = I Rarely Ever Use Multimedia Presentation Software for this purpose
2 = I Occasionally Use Multimedia Presentation Software for this purpose
3 = I Frequently Use Multimedia Presentation Software for this purpose
4 = I Very Frequently Use Multimedia Presentation Software for this purpose

I use multimedia presentation software: (Please circle the appropriate response)

Never | Very Frequently
--- | ---
0 | 1 | 2 | 3 | 4

1. to conduct training sessions for employees of an organization (for the purpose of enhancing their on-the-job performance)

2. to deliver education to adult learners in a formal classroom setting (wherein the course being taught is listed in the official course catalog for the university or college)

3. to assist in the development of instruction for adult learners

4. to generate on-line, web-based, independent learning assignments for adult learners

5. to assist in the development of professional articles on using multimedia by adults

6. for some other purpose: ________________

96
PART II. Level and types of selected multimedia presentation software being used. Please indicate, by circling the appropriate number, your level of usage of the following types of multimedia presentation software packages.

<table>
<thead>
<tr>
<th>KEY</th>
<th>0 = I Never Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 = I Rarely Use</td>
</tr>
<tr>
<td></td>
<td>2 = I Occasionally Use</td>
</tr>
<tr>
<td></td>
<td>3 = I Frequently Use</td>
</tr>
<tr>
<td></td>
<td>4 = I Very Frequently Use</td>
</tr>
</tbody>
</table>

Circle the appropriate number associated with the use of the following types of multimedia presentation software packages.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Astound</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Authorware Professional</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Dreamweaver</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Flash</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Lotus Learning Space</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Microsoft Power Point</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Podium</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Quest</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Quicktime</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Real Media</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Shockwave</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Toolbook</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Topclass</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Web CT</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
PART III. How did you learn to use multimedia presentation software?
Instructions: If you use multimedia presentation software for any purpose, please rank the following statements, using 1, 2, 3, and 4 on the appropriate lines, to describe how you learned to use the software. A '1' would indicate that the statement represents the most significant method for learning the software; a '4' would indicate that the statement represents the least significant method.

__________ 1. I attended one or more formal training session designed to help users learn the software

__________ 2. I took a formal course at an institution of higher learning

__________ 3. I participated in on-the-job training

__________ 4. I taught myself via self-study, practice, manual, CBT (CD-ROM), or video

PART IV. How valuable is the use of multimedia presentation software to you in performing the aspects of your job listed below? Use the following scale of 0 - 3 with 0 = Not at All Valuable, 1 = Very Limited Value, 2 = Somewhat Valuable, and 3 = Very Valuable.

(Please circle one per line item)

<table>
<thead>
<tr>
<th></th>
<th>Not at all Valuable</th>
<th>Very Limited Value</th>
<th>Somewhat Valuable</th>
<th>Very Valuable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching adult learners in a formal classroom setting</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Conducting training sessions in a business or industry setting</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Making professional presentations</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Developing instruction</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Accessing materials on the Internet</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
**PART V. Barriers/problems encountered when using multimedia presentation software.**

Instructions: Please indicate, by circling the appropriate number, the degree to which you believe the following statements describe the barriers/problems you encountered when using multimedia presentation software.

How frequently do the following factors limit the frequency with which you use multimedia software to deliver education or training to adult learners? Use the following scale of 0-4 with 0 = never a barrier, 1 = seldom a barrier, 2 = sometimes a barrier, 3 = often a barrier, and 4 = always a barrier.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Never a Barrier</th>
<th>Seldom a Barrier</th>
<th>Sometimes a Barrier</th>
<th>Often a Barrier</th>
<th>Always a Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology not available in classroom or training room</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Hardware malfunction</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Software not working properly</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Server down-time</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. System timed out</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Computer response too slow</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Equipment already in use by somebody else</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Equipment not available in classroom</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Setup time too lengthy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Lack of knowledge of hardware</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Lack of resources</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Other: ___________________________________________________________</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
PART VI. DEMOGRAPHIC CHARACTERISTICS

1. What is your highest educational degree? (Please check)
   _____ Master's degree
   _____ Ph.D. degree
   _____ Other: ________________

2. In what year did you earn your highest degree?
   19 _____

3. In what year did you last participate in a formal training course to learn how to use multimedia presentation software?
   19 _____
   _____ I have never participated in a multimedia presentation formal training course. (If checked, skip to item 6 of Demographic Characteristics)

4. Did your employer pay for the training?
   _____ Yes, in full
   _____ Yes, in part
   _____ No

5. Do you currently use the software for which you were trained?
   _____ Yes
   _____ No
6. What is your gender?:

___ male
___ female

7. In what year were you born?

19 ___

8. What is your present position title: (Please check only one)

___ Instructor
___ Assistant Professor
___ Associate Professor
___ Professor
___ Other: _________________

9. How many years have you been teaching at the university/college level?

______ years

10. How many times have you conducted training sessions in a business/industry setting during the past two years?

______ times    ______ not applicable

11. How many years of experience do you have using multimedia presentation software?

______ years
PART VII. OTHER COMMENTS.

Instructions: Please use this area to state any additional comments or suggestions you may have regarding the use of multimedia presentation software. (If you care to share information that would help eliminate a barrier/problem when using multimedia presentation software or, in some way, increase the effectiveness of its use, please use this area to tell your story.)

THANK YOU!

Thank you very much for completing this survey. Please place the completed survey in the stamped, self-addressed envelope provided for your convenience in returning the survey to me. Your survey will be tracked for a response, but your individual answers will be absolutely kept strictly confidential.

Reva Hutchins, Ph.D. Candidate
Center on Education and Training for Employment (CETE)
The Ohio State University
Columbus, Ohio 43210
APPENDIX B

PANEL OF EXPERTS

- Letter
- GUIDE
- List
December 8, 1998

To Panel of Experts Members: Mr. Brian Beverly Dr. Janet Henderson
Dr. A. J. Miller Dr. Anthony Olinzock
Dr. Ray Ryan Jr. Dr. James Seaman

Dear Panel of Experts Members,

Thank you for agreeing to serve as a member of my Panel of Experts Committee. Each of you is perceived as an expert in the educational arena, so, I really appreciate your willingness to serve. As I explained during our telephone conversation, I really need your assistance in helping me to establish both face validity and content validity for the survey instrument, Multimedia Presentation Software Usage in the Delivery of Education and Training to Adult Learners, included as Attachment 1. I plan to use the instrument as part of my dissertation research.

The purpose of the study I plan to conduct is to describe the level of use for selected types of multimedia presentation software among educators and trainers employed at Cedarville College, Cedarville, Ohio; Central State University, Wilberforce, Ohio; and Wright State University, Fairborn, Ohio. The study will provide data which will answer research questions relating to the extent is used by educators/training to adults. Educators are defined as those individuals, primarily college/university professors, who deliver education or other instruction to adults in an educational setting. Trainers are defined as those individuals who deliver training to adults in a business/occupational setting for the purpose of increasing the job performance of the person being trained.

Responses to Part I will determine for what purpose and frequently multimedia presentation software packages are being used by educators/trainers. Part II will determine what level and types of selected software are being used; Part III will indicate how the educator/trainer learned how to use the software; Part IV will show how valuable the software usage is perceived to be regarding five selected usages; Part V will determine the barriers and problems the educators/trainers encountered when using the software; and Part VI will provide demographic data about the respondents in the study. I am requesting that each of your review the questionnaire to determine whether the instrument looks like it will measure what it is supposed to measure and will, in fact, measure what it is supposed to measure (face and content validity). A Guide for Panel of Experts is included as Attachment 2. A census population of 160 college and university professors, employed full-time in the areas of education and business, will comprise the frame for the study.

Thank you again for your contribution to my research effort. Please return your response to me in the attached stamped, self-addressed envelope within ten days. If you have questions, I may be contacted at e-mail address hutchins.28@OSU.edu.

Sincerely,

Reva Hutchins. Researcher
Ph.D. Candidate

3 Attachments: 1) Instrument
2) Guide for Experts
3) Return Envelope
GUIDE for Panel of Experts

Please look at each task statement for: 1. Clarity, 2. Wording, 3. Thoroughness, 4. Ease-to-Use, and 5. Appropriateness

Please use this form to rate degree of fit for each of the above items; then indicate for item 0-5.

(Circle Response)

| PART I: For What Purpose and Frequency is Multimedia Presentation Software Used In the Delivery of Education or Training to Adults? |
|---|---|---|---|---|---|
| 1. To Conduct Training Sessions | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. To Deliver Education to Adults | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. For Instructional Development Purposes | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. To Generate On-line, Web-based Assignments | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. To Assist in Writing Professional Articles about Using Multimedia | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. For Some Other Purpose | 0 | 1 | 2 | 3 | 4 | 5 |

| PART II: Level and Types of Selected Multimedia Presentation Software Used by Educators/Trainers |
|---|---|---|---|---|---|
| 1. Astound | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. Authorware Professional | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. Dreamweaver | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. Flash | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. Lotus Learning Space | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. Microsoft Power Point | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. Podium | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. Quest | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. Quicktime | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. Real Media | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. Shockwave | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. Toolbook | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. Topclass | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. Web CT | 0 | 1 | 2 | 3 | 4 | 5 |
PART III: How did you learn to use Multimedia Presentation Software?

<table>
<thead>
<tr>
<th>No Fit</th>
<th>Best Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Attended a formal training session</td>
<td>0</td>
</tr>
<tr>
<td>2. Took a formal course at an institution of higher learning</td>
<td>0</td>
</tr>
<tr>
<td>3. Participated in on-the-job training</td>
<td>0</td>
</tr>
<tr>
<td>4. Self-taught via self-study, practice, manual, CBT (CD-ROM, or video)</td>
<td>0</td>
</tr>
</tbody>
</table>

PART IV: How Valuable is the Use of Multimedia Presentation Software to you when:

<table>
<thead>
<tr>
<th>No Fit</th>
<th>Best Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Teaching adults in a formal classroom setting</td>
<td>0</td>
</tr>
<tr>
<td>2. Conducting training sessions in a business or industry setting</td>
<td>0</td>
</tr>
<tr>
<td>3. Making professional presentations</td>
<td>0</td>
</tr>
<tr>
<td>4. Developing instruction</td>
<td>0</td>
</tr>
<tr>
<td>5. Accessing materials on the Internet</td>
<td>0</td>
</tr>
</tbody>
</table>

PART V: Barriers and problems experienced when using Multimedia Presentation Software

<table>
<thead>
<tr>
<th>No Fit</th>
<th>Best Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Technology not available in classroom or training room</td>
<td>0</td>
</tr>
<tr>
<td>2. Hardware malfunction</td>
<td>0</td>
</tr>
<tr>
<td>3. Software not working properly</td>
<td>0</td>
</tr>
<tr>
<td>4. Server down-time</td>
<td>0</td>
</tr>
<tr>
<td>5. System timed out</td>
<td>0</td>
</tr>
<tr>
<td>6. Computer response too slow</td>
<td>0</td>
</tr>
<tr>
<td>7. Equipment already in use by somebody else</td>
<td>0</td>
</tr>
<tr>
<td>8. Equipment not available in classroom</td>
<td>0</td>
</tr>
<tr>
<td>9. Setup time too lengthy</td>
<td>0</td>
</tr>
<tr>
<td>10. Lack of knowledge</td>
<td>0</td>
</tr>
<tr>
<td>11. Lack of resources</td>
<td>0</td>
</tr>
<tr>
<td>12. Other: _________________________</td>
<td>0</td>
</tr>
</tbody>
</table>
PART VI: Demographic Characteristics

1. What is your highest educational degree? 0 1 2 3 4 5
2. What year did you earn your highest degree? 0 1 2 3 4 5
3. In what year did you participate in a formal training course? 0 1 2 3 4 5
4. Did your employer pay for the training? 0 1 2 3 4 5
5. Do you currently use the software for which you were trained? 0 1 2 3 4 5
6. What is your sex? 0 1 2 3 4 5
7. In what year were you born? 0 1 2 3 4 5
8. What is your present position title? 0 1 2 3 4 5
9. How many years have you been teaching at the college level? 0 1 2 3 4 5
10. How many years have you been conducting training sessions in a business or industry setting? 0 1 2 3 4 5
11. How many years have you used multimedia presentation software? 0 1 2 3 4 5

PART VII: Other Comments

Note: This guide has been provided as a convenience for your assessment of the items as listed on the enclosed survey instrument. The clarity, wording, thoroughness, ease-to-use, and appropriateness of the corresponding items on the instrument are what I am asking you to assess.

You are not being asked to complete the instrument.

THANK YOU!
Panel of Experts List

Mr. Brian Beverly
Center for Teaching and Learning/Multimedia Lab
054 Rike Hall/ Wright State University
3640 Colonel Glenn Highway
Fairborn, OH  45435

Dr. A. J. Miller
5603 Villa Gates Dr.
Hilliard, OH 43026

Dr. Ray D. Ryan
1080 Kirk Ave.
Worthington, OH 43085

Dr. Janet Henderson
4540 Zeller Road
Columbus, OH 43214-2253

Dr. Anthony Olinzock
2828 Edgewood Rd.
Columbus, OH 43220

Dr. James Seaman
2035 Firebird Dr.
Bellbrook, OH  45305
APPENDIX C

LETTER TO FIELD TEST PARTICIPANTS
May 3, 1999

Dear Professor,

You have been selected to participate in a field test as part of a research study. You were selected because you are an educator who teaches or trains adults in the areas of business or education at a college or university in the State of Ohio. The purpose of the study is to collect data that will be used to describe the level of use of selected multimedia presentation software when delivering education and/or training to adults. Educators are defined as those individuals, primarily college/university professors, who deliver education or other instruction to adults in an educational setting. Trainers are defined as those individuals who deliver training to adults in a business/occupational setting for the purpose of increasing the job performance of the person being trained.

Please take the time to complete the enclosed questionnaire and return it to Professor Thomas W. Ferratt's office at 4 Anderson Center no later than Monday, May 10, 1999. The questionnaire can be completed in approximately 15 minutes. The questionnaire has an identification number for distribution and tracking purposes only. However, your responses will not be reported in any manner that would breach confidentiality.

A meeting will be held in Professor Ferratt's office at 2:00 p.m. on May 10, 1999 for all participants who care to participate in the discussion of the questionnaire. In addition to discussing the questionnaire, two questions will be discussed at the meeting: 1) Is the questionnaire ready to be mailed to the pilot test participants? ___ Yes ___ No, and 2) Are three new one dollar bills considered an appropriate incentive for returning the questionnaire? ___ Yes ___ No. If you will not be attending the meeting, please check your opinions on these two questions and return this letter with your questionnaire in the envelope provided. If your mailing address is incomplete or incorrect, please make those corrections, also.

Thank you very much for your time and participation. Your responses regarding this issue will be highly valued.

Sincerely,

Reva Hutchins, Researcher
Ph.D. Candidate

Cc: Dr. Ray Ryan, Graduate Advisor

2 Attachments: 1) Questionnaire
               2) Return envelope
May 10, 1999

Dear Educator,

You have been selected to participate in a pilot test because you are an educator who teaches or trains adults in the areas of business or education at a college or university in the State of Ohio. The purpose of the study is to collect data that will be used to describe the level of use of selected multimedia presentation software when delivering education and/or training to adults. Educators are defined as those individuals, primarily college/university professors, who deliver education or other instruction to adults in an educational setting. Trainers are defined as those individuals who deliver training to adults in a business/occupational setting for the purpose of increasing the job performance of the person being trained.

Please take the time to complete the enclosed questionnaire and return it to me within five days after receipt. The questionnaire can be completed in approximately 15 minutes. You may be assured of complete confidentiality. The questionnaire has an identification number for distribution and tracking purposes only. Your responses will not be reported in any manner that would breach confidentiality.

After completing the questionnaire, kindly place it in the stamped, self-addressed envelope, provided for your convenience in returning the questionnaire, and drop in the mail. Please accept the enclosed serving of tea as a token of my gratitude for returning the questionnaire by May 15, 1999.

Thank you very much for your time and participation. Your responses regarding this issue will be highly valued.

Sincerely,

___________________________________________  _______________________________________
Reva Hutchins, Researcher                Ray D. Ryan
Ph.D. Candidate                        Associate Professor
                                      Graduate Advisor

112
May 17, 1999

Dear Educator,

Earlier this month, you were sent a questionnaire and letter which explained that you had been selected to participate in a pilot test. You were selected because you are an educator who teaches or trains adults in the areas of business or education at a college or university in the State of Ohio. The purpose of the study is to collect data that can be used to describe the level of use of selected multimedia presentation software when delivering education and/or training to adults. The purpose of this mailing is to collect data that will be used as part of the test-retest method for establishing reliability of the questionnaire and test data. The test-retest method will be useful in determining the stability of the scores between the testing and retesting. It is essential!

Again, I am asking you to please take the time to complete the enclosed questionnaire and return it to me within five days after receipt. The questionnaire can be completed in approximately 15 minutes. Complete confidentiality is assured. The questionnaire has an identification number for distribution and tracking purposes only. Your responses will not be reported in any manner that would breach confidentiality.

A stamped, self-addressed return envelope is provided for your convenience in returning your questionnaire. After completing the questionnaire, please place it in the envelope and drop in the mail. The goal is to receive all retest responses before May 25, 1999.

Thank you very much for your time and participation. Your responses regarding this issue are very important to the success of this study and will be highly valued.

Sincerely,

Reva Hutchins, Researcher
Ph.D. Candidate

Ray D. Ryan
Associate Professor
Graduate Advisor

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APPENDIX E

LETTERS TO SURVEY PARTICIPANTS
May 25, 1999

Dear Educator,

You have been selected to participate in a study because you are an educator who teaches or trains adults in the areas of business or education at a college or university in the State of Ohio. The purpose of the study is to collect data that will be used to describe the level of use of selected multimedia presentation software when delivering education and/or training to adults. Educators are defined as those individuals, primarily college/university professors, who deliver education or other instruction to adults in an educational setting. Trainers are defined as those individuals who deliver training to adults in a business/occupational setting for the purpose of increasing the job performance of the person being trained.

Please take the time to complete the enclosed questionnaire and return it to me within five days after receipt. The questionnaire can be completed in approximately 15 minutes. You may be assured of complete confidentiality. The questionnaire has an identification number for distribution and tracking purposes only. Your responses will not be reported in any manner that would breach confidentiality.

A self-addressed return envelope is provided for your convenience in returning your questionnaire. After completing the questionnaire, please place it in the envelope and drop in the mail. Please accept the enclosed serving of tea as a token of my appreciation for returning your response by June 4, 1999.

Thank you very much for your time and participation. Your responses regarding this issue will be highly valued.

Sincerely,

Reva Hutchins, Researcher
Ph.D. Candidate

Ray D. Ryan
Professor
Graduate Advisor
June 8, 1999

Dear Educator,

Last month you were selected to participate in a study. Your response has not yet been received. This letter is to inform you that it is not too late to complete and return the questionnaire. As explained earlier, you were selected because you are an educator who teaches or trains students in higher education in the areas of business or education at a college or university in the State of Ohio. The purpose of the study is to collect data that can be used to describe the level of use of selected multimedia presentation software when delivering education and/or training to adults. Educators are defined as those individuals, primarily college/university professors, who deliver education or other instruction to adults in an educational setting. Trainers are defined as those individuals who deliver training to adults in a business/industry setting for the purpose of increasing job performance of the person being trained. Adult learner is defined on page 1 of the questionnaire.

We are appealing to you to please take the time to complete the questionnaire and return it within five days after receipt of this letter. The questionnaire can be completed in approximately 15 minutes. The questionnaire has an identification number for distribution and tracking purposes only. Your responses will not be reported in any manner that would breach confidentiality.

After completing the questionnaire, kindly place it in the stamped, self-addressed envelope which was provided and drop in the mail. The study cannot be successful without a minimum number of responses.

Thank you very much for your time and participation. Your responses regarding this issue are extremely important to the success of this study and will be highly valued.

Sincerely,

Reva Hutchins, Researcher
Ph.D. Candidate

Ray D. Ryan Jr., Graduate Advisor
Associate Professor
APPENDIX F

COMMENTS from Participants
Comments from respondents disclosed perceptions and feelings held toward the usage of multimedia presentation software (MPS). The comments were grouped into four categories which included 1) Constraints to MPS Usage, 2) Training to use MPS, 3) Suggestions for enhancing usage of MPS, and 4) General Comments. The following comments regarding MPS usage, and the study in general, were submitted by respondents:

1) **Constraints to MPS Usage**

"I am interested in using because multimedia presentation software; it is the way to go. However, my schedule is horrendous. I would welcome an opportunity to develop expertise to assist with the effectiveness of my instruction."

"My approach to teaching is inquiry-based mathematics; therefore, multimedia presentations are usually inappropriate."

"Multimedia is a great tool for creating overhead transparency masters and the corresponding handouts for students. But, I cannot teach math and statistics on a fully automated slide-show. It is too inflexible of a technology for backing up/side trips and other excursions necessary to explain a mathematical concept."

"Problem with this new technology is too much information. It is overwhelming."

"I do not use multimedia presentations because I have not had the time nor the work space to learn how to create them."

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“Until now, the tools available made them more toys than tools (dim image from a cumbersome device sitting on top of an overhead projector). Now, the technology almost seems to be catching up with the old-fashioned overhead.”

“Developing a multimedia application depends, to a large extent, on the availability of reliable and speedy hardware. Small institutions have a hard time securing such hardware for its faculty. Most of the hardware and software I use came as a result of a personal project supported by external agency/industry. The continuation of the efforts depends on the availability of funds for workers and system updates. The situation may improve if institutions see the advantage of using multimedia courseware and actively support it. Also, if some mandate like a certain percentage of the class be delivered via multimedia presentation, faculty would engage more in such development. Training faculty is also a barrier for the wide-spread use of multimedia in classrooms.”

“I do not use multimedia presentations because I have viewed or watched colleagues present these and they never work well because the equipment goes down or does not work and they are unable to get the equipment to work. Also, every professor I know who uses computerized presentations also creates a back-up of overheads - to me, this is twice the work.”

“I would use multimedia presentation software more if the campus network was such that it was always up and working.”
“Specific barriers for me include a lack of scanners being available; lack of audio/video hardware and software to integrate materials for preparation and delivery; lack of adequate training in multimedia software; and a lack of preparation time.”

“One problem is that equipment and software is often updated in the classroom (Media Services Unit) without regard to compatibility with faculty equipment and software, i.e., upgrading out of synch.”

“Our institution does not have the funds available to support multimedia technology, and we also have a problem keeping a sufficient number of educators. Multimedia was not available to me when I taught in public high schools either.”

“I can imagine users for this software. But our institution lacks the resources to acquire it, and I have not had the training to use it. This kind of multimedia software would be very useful to me. However, we do have a web site where students may use multimedia.”

“During the 1999 Annual Meeting of the Mid-Western Educational Research Association (October, 1999 - Chicago), I will attempt to address related barriers/hurdles in my presentation, How Should Technology be Integrated in the Pre-Service Science Teacher Curriculum?”

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2) Training to Use MPS

"I received training in 1998 on the use of multimedia, but the training was superficial. Still, I plan to begin using multimedia software in a graduate class I will be teaching in the fall."

"Here at our university, we get short 1-2 hour training sessions in software such as Astound, which is never enough to feel comfortable with the software. The biggest problem is that the images projected on the screen are of such poor quality that the brightness contrast is not sufficient to overcome normal lighting conditions."

"I am a relatively new user of multimedia presentation software, but I’m hooked! I taught myself (because it was more efficient to solve problems right now). I’ve often had questions and wish I could be taught the most effective way to solve the problem - right then. It’s much easier to be taught than to teach oneself!"

"I would like to use multimedia presentation software. If a workshop on using the software was available on campus, and if I had access to the software on my computer, I would be more inclined to use it. Presently, it is too convenient to consider my other academic duties priority over learning the software on my own."

"I plan to get formal training on the use of multimedia presentation software in the near future. I hope to begin using multimedia after such time."
"I would like to use multimedia presentation software. If a workshop on using the software was available on campus, and if I had access to the software on my computer, I would be more inclined to use it. Presently, it is too convenient to consider my other academic duties priority over learning the software on my own."

"When the technology becomes better than the old-fashioned overheads, it becomes a real tool rather than a curiosity. I would like to look for a training course."

"I plan to enroll in classes to learn more about using technology effectively."

3) Suggestions for Enhancing Usage of MPS

"Handouts should be appropriately designed to supplement a presentation. They are vital when seeking to augment instruction or to inform about a detailed process or procedure."

"Assistance from a non-professional who will do the "grunt" work is very helpful for the older faculty who have reluctance to commit the necessary time."

"Increase the percentage of classrooms equipped for multimedia presentation on state college campuses."
“a) Font size must be keyed to presentation screen - with 25” TV - use 24” or greater. With a large projection screen - maybe as small as 14 “BOLD” helps. Avoid all caps - difficult to read.”

“b) I once used too many scrolling effects on TV and had some attendees feeling seasick. A little is good.”

“c) Too many different media have the audience looking for “What’s Next,” not in content but presentation style.”

“Also, practice before the session and have someone run the software if possible. I keep old workshop materials either in part or whole mix.” “A knowledge of layout, design, and typography is also helpful in accomplishing objectives.”

“Integrate into teacher licensing, a requirement which demonstrates multimedia software proficiency.”

4) General Comments

“As a statistician, I must point out that the question regarding how multimedia was learned has the possibility of more than one answer. Thus, I would have to question any conclusions drawn because all respondents are not answering the question from the same point of view.”

“Our student body is not graduate nor adult learners working in industry. We have Internet access in all classrooms used for business. All students and professors have PowerPoint, Corel presentations, and WWW contact through PCs in their offices/dorms.”
“Good questions. Please make results available to faculty, if possible.”

“Students in my classes are routinely required to use PowerPoint for class assignments. However, ironically, I have never had time to learn it.”

“It would be nice if faculty members who try new things such as multimedia software were given up-to-date hardware and software and financially compensated for being innovative.”

“Response time for this survey questionnaire was not reasonable. The only reason I completed it was due to its brevity, for which I was thankful.”

“Change language in cover letter so it doesn’t say “you have been selected.” I get several of these weekly - I recognize that so do many. This is asking us to devote time we do not have - with time/energy sacrifice. I felt patronized.”

“To understand my responses, I teach in an off-campus graduate program for educators.”

“Multimedia is great if used appropriately. I find it is an expensive “fad” at times. I see faculty with a $3,000.00 laptop, $1,000.00 worth of software, and a $2,000.00 projector. They are basically showing $6,000.00 overheads, which is not multimedia.
“It took two years to get the college/department to purchase a projector for which I have complete control. Now that I have it, a lot of problems have disappeared.”

“Since I teach effectively without multimedia software and have little spare time to learn it, I have little interest in learning how to use the software.”

“My current position has little involvement with the business community.”

“Just took training this year on PowerPoint and Top Class. I plan to use both next year.”
BIBLIOGRAPHY


