This research compared the effectiveness of an interactive video training program with an instructor-led program for teaching working adults the personal computer (PC) application WordPerfect. The objectives of the study were to develop a research methodology and instrumentation in order to determine whether instructor-led training resulted in significantly different reaction, performance, and post-training use than interactive video instruction and to utilize the findings to suggest strategies for teaching working adults PC applications.

The study was based on the need to comparatively evaluate various instructional approaches for teaching PC applications to working adults. There is also an underlying need in computer training is for easily administered, yet comprehensive evaluation methodologies. There were 111 individuals in the original sample. Half were randomly assigned to a interactive video group and half to an instructor-led group. After initial dropouts there were 53 individuals in the instructor-led group and 47 in the interactive video group. Instructional objectives, content and topic sequence were the same for both groups. A pilot study was conducted to confirm the reliability and validity of the instruments and methodology.
A demographic questionnaire was completed at the beginning of an initial training session. At the end of the first training session a performance test and a reaction questionnaire were completed. After two to three weeks a use survey, a knowledge test, and a performance test were completed. Descriptive and analytic statistics were prepared for the dependent variables (reaction, performance, and post-training use) and covariates (age, gender, occupation, organization, education, and prior use). Null hypotheses of no difference were rejected when the significance was less than .05.

Results indicated no significant differences in performance between the groups after either the first training session or after two to three weeks. However, results indicated significant differences \((p = .0004)\) in reaction with the instructor-led group rating the training better overall. The instructor-led group also indicated that the clarity and usefulness of the course materials was better \((p = .035)\). Significant differences were also found in post-training use \((p = .036)\).
A Comparison of Instructor-Led and Interactive Video Training for the Personal Computer Application WordPerfect

by

William D. Carter

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Redacted for Privacy

Professor of Postsecondary and Technological Education in charge of major

Redacted for Privacy

Chairman of the Department of Postsecondary and Technological Education

Redacted for Privacy

Dean of the College of Education

Redacted for Privacy

Dean of the Graduate School

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I. INTRODUCTION

Why are we thrashing around doing all this training if we don’t know whether it works or not, and even if it does "work," whether it has any impact on our companies’ bottom lines? We can’t justify all this activity simply because it is the right thing to do intuitively. (Stein, 1987, p. 4)

Overview

This research compared and contrasted the effectiveness of an interactive video training program with an instructor-led program for teaching working adults the personal computer (PC) application WordPerfect (TM).

Evaluations of two groups of working adults were administered to individuals who completed an instructor-led training program and an interactive video training program. Of primary interest were: (a) whether the instructor-led training produced more favorable end-of-training reactions than the interactive video program, (b) whether students in the instructor-led group scored higher on an end of training performance test on a simulated job task, (c) whether the instructor-led training produced more post-training use of WordPerfect, and (d) whether performance differed significantly after a period of time between the two groups. An evaluation methodology and instruments were developed to collect these data. Literature was reviewed in the areas of interactive
video instruction (IVI) and related technologies as well as in the area of evaluation of professional development training programs.

Subjects for the study were 100 working adults with half of the individuals in the instructor-led training group and half in the interactive video training program. A random selection process was developed to place the sample subjects in either the instructor-led or interactive video group to insure an unbiased sample. Recruitment and selection methods followed typical recruitment processes of organizations devoted to the type of training that this study investigated. Background data on each student including previous computer use, ownership of a personal computer, as well as basic demographic information were collected and correlated. A pilot study was conducted to insure reliability and validity of the instruments and methodology.

**Purpose**

The purpose of this study was to determine whether instructor-led instruction of WordPerfect to working adults resulted in significantly different reaction, performance and post-training use than interactive video instruction. This research will assist instructors and course developers in making better choices in the methods they use to teach working adults personal computer applications.

The major objectives of the study were:

1. Develop a research methodology and instrumentation to determine the relative effectiveness of instructor-led and interactive video training.
2. Determine whether instructor-led training of WordPerfect resulted in significantly different reaction, performance and post-training use than interactive video instruction.
3. Utilize the findings to suggest strategies for training working adults personal computer applications.
Background of the Problem

An important and rapidly expanding area for training and development professionals is office automation training. A few years ago personal computers were often purchased without much concern for how prospective users would learn to use them. Personal computers were introduced into the work environment and individuals were left on their own to develop the skills necessary to apply the technology in a productive manner. Organized training of PC users was the exception rather than the rule (Feil, 1990).

The inclusion of training and staff development activities related to personal computers has only recently become part of the PC acquisition effort of many organizations. Some agencies and companies now budget for user training when they acquire the technology. Seventy percent of the organizations surveyed in Training Magazine (Oberle, 1989) provided training in basic computer skills which suggests that there is at least a recognition of the importance of training as a major component of office automation. The extent and nature of this training is the next important issue. One study indicated that 31% of PC productivity packages (e.g., spreadsheets, desktop publishing packages, word processors) were not being used six months after installation. The study also reported that of the respondents who use such packages regularly, 40% believe they received inadequate training (Pane, 1990).

Training directors as well as individual users of personal computers have the opportunity to choose from many different forms of training. Among their choices are interactive video programs, tutorial disks, audio cassette programs, hands-on workshops and seminars, courses at universities and community colleges and an expanding number of books on a broad variety of personal computer uses and applications. Oberle (1989), in the survey cited above, indicated that organizations with 100 or more employees budgeted for 1989 more than 44.4 billion dollars for direct training expenses. Millions of
these dollars are spent annually on providing office automation training often without significant knowledge of the relative effectiveness of alternative approaches.

The broad question facing training and development professionals is, therefore, how to most effectively provide training to working adults who did not learn to use the technology in school and presently find themselves with a need to either learn basic PC skills or to expand their knowledge and skills related to the technology. This question can be broken into the following subordinate questions:

1. How do we allocate resources to provide the most effective opportunity for these working adults to learn PC applications?
2. Should training dollars be spent on developing classroom facilities and on the development of instructor-led training programs?
3. Are technological methods such as interactive video instruction (IVI) and computer-based training (CBT) more cost effective than other methods?
4. Is the often used "just-thumb-through-the-manual" method just as effective in the long run as more formal and expensive instructional methods?

Each of the above questions needs additional clarification so that appropriate and effective delivery methods of PC training can be made available to working adults. The individuals who make decisions about the training needs of others need greater information in order to commit their training resources to the most effective and beneficial programs.

There is a need to explore computer-based training and interactive video because of the widespread use among professionals of the use of video and computers for instruction and training. A number of software companies have begun to offer interactive disk programs that guide a PC user through a specific application. Other options include training videos, from those that are essentially a classroom lecture on tape to highly interactive programs incorporating the latest personal computer, video, and data storage technologies (Feil, 1990). Although many alternative technologies have emerged or
show promise as training delivery vehicles, interactive video (at all levels of interactivity) is an area of high interest and activity in industry and academia. In an American Society for Training and Development (ASTD) survey of 200 human resource executives in Fortune 500 corporations and privately held firms (ASTD, 1989), 81% reported using CBT technology for training and half reported using interactive video. Most responding executives indicated, however, that they were not sure whether these instructional technologies were cost-effective.

Results of the ASTD survey suggest that CBT use will increase from a current 12% to more than 29%, and IVI will increase from a current 50% use among the responding companies to 71% by 1992. Only 59% of the responding executives said CBT was clearly cost-effective or produced satisfactory benefits, and they were even less certain about interactive video. Only 30% rated IVI as clearly or satisfactorily cost-effective. What this suggests is expanding use of computer-based training and interactive-video instruction even though the executives buying the training have considerable uncertainty about it's effectiveness.

Need for the Study

This research is important for several reasons. There is a need for comparative evaluation of the various instructional methods adult educators use in providing instruction. This is particularly the case in non-academic professional settings where the effort to evaluate is often lost or suppressed in the "crush" of business priorities.

Also, in the area of office automation training, which continues as an important area of professional development and staff training, there is a need to look closely at the tools and methods available to trainers. Millions of dollars are spent annually on various training programs without adequate knowledge regarding the relative effectiveness of these programs. For example, the ASTD survey cited above revealed that only 59% of
the respondents indicated that CBT was clearly effective, and only 30% rated interactive
video instruction as clearly or satisfactorily effective.

Steven Drake in "Does IVI Really Work?" asks:

Is interactive video training truly more effective than computer-based
training, than linear video, than instructor-led seminars? Put another way,
does interactive video really allow students to learn faster, and to better
master skills, than these other media? The answer is -- well, we really
don't know (Drake, 1987, p. 16).

Bruce Mills states that although common training alternatives to classroom train-
ing include interactive videodisc and videotape as well as CBT courses run entirely on
the PC, these courses are not consistently effective and can result in a lot of frustrated
users who subsequently require a great deal of support. (Mills, 1987).

Jane Stein, Editor of Data Training, conducted an investigation to find out if there
were any controlled studies that compared interactive video's instructional effectiveness
to any other delivery method. Stein suggests that, in looking for controlled studies on
interactive video's effectiveness, that there was not much to be found (Stein, 1987).
Stein puts the need for research on the topic directly to her audience. She states:

How about it? Has anybody got any figures that say that good, formal
spreadsheet training makes any difference against time-honored just-
thumb-through-the-manual-when-you-get-into-trouble method? Do
programmers write more and better code if you send them to class to learn
the new Cobol, or do they do just as well with a stack of reference
material? How do you measure programmer productivity anyway? Or
effective middle manager use of 1-2-3? We not only haven't done the
studies, we haven't put much effort into figuring out what we'd study if we
had the energy (Stein, 1987, p. 4).

Deciding what to study and how to measure effectiveness of various training op-
tions are key issues. Reduction of training time has often been considered a key criteria
of effective training. Drake suggests that, although reduction of training time is gener-
ally thought to be a benefit of interactive video, it may be an invalid measure. He states
that it is not just the time "it takes someone to get through the training, but the level of the skills retained, mastered and transferred to the job" that is the true measure of effectiveness (Drake, 1987, p. 16) (emphasis provided). The purpose of this study is to compare two instructional approaches, instructor-led training and interactive video instruction, to address questions of skill retention and transfer.

The Research Problem

The central problem of this study was to compare and contrast the reactions, performance and post-training use of working adults who were taught a personal computer application by an instructor with those taught by interactive video.

The evaluation methodology included: (a) an examination of participant reactions; (b) an end of training performance test to clarify the extent to which the material was understood and learned; (c) a measurement of the post-training use of WordPerfect; and (d) a performance test administered after a period of two to three weeks of use of WordPerfect.

The personal computer application WordPerfect was chosen for the study because it has had a lead position among PC software products for several years. This market position provides a large installed base of users and a high degree of interest in the methods most appropriate for learning to use WordPerfect. These factors assisted in providing the researcher with a large potential population from which to draw a sample.

Table 1.1 shows the percentage of individuals attending PC Training at Northwest Computer Learning Center (NWCLC) during the first calendar quarter of 1991. Of the
Table 1.1  Personal Computer Students by Gender- NWCLC (Jan. - Mar. 1991)

<table>
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<th>Product Category</th>
<th>Percent Male</th>
<th>Percent Female</th>
<th>Percent Total</th>
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<tr>
<td>General</td>
<td>32.4</td>
<td>67.6</td>
<td>23.6</td>
</tr>
<tr>
<td>Wordprocessing</td>
<td>16.2</td>
<td>83.8</td>
<td>36.5</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>37.5</td>
<td>62.5</td>
<td>11.1</td>
</tr>
<tr>
<td>Database</td>
<td>46.2</td>
<td>53.8</td>
<td>22.6</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>5.6</td>
<td>94.4</td>
<td>6.3</td>
</tr>
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</table>

Percent of Total 28.5 71.5 100.0

categories listed, wordprocessing accounts for 36.5% of all training provided on PC applications (NWCLC, 1991).

This study focused on working adults because little comparative research was available on working adults which explored the effectiveness of alternative instructional delivery methods, particularly in the area interactive video instruction.

**Hypotheses**

The following null hypotheses were tested for significance at the .05 level:

**Hypothesis 1**

There is no significant difference in reaction to the training between the interactive video trained group and the instructor-led group.

**Hypothesis 2**

There is no significant difference in performance between the interactive video trained group and the instructor-led group.

**Hypothesis 3**

There is no significant difference in post-training use between the interactive video trained group and the instructor-led group.

**Hypothesis 4**

There is no significant difference in performance after two to three weeks between the interactive video trained group and the instructor-led group.
Delimitations

This study was delimited to:

1. Working adults recruited to learn WordPerfect from Oregon Department of Revenue, Oregon Department of Corrections, and Oregon State Marine Board.
2. Two modes of instruction -- instructor-led and interactive video.
3. A single interactive video program chosen as representative of the products available. The program selected was chosen from a group of candidate products by selected members of the Oregon Executive Department Technology Learning Center (TLC) Advisory Group and additional training coordinators appointed to the review panel.
4. Evaluation of reaction, performance and amount of post-training use as defined below.

Limitations

Random assignment into the instructor-led group or the IVI group eliminated the effect of any limitations.

Definitions of Terms

Effectiveness: Whether or not the training: (1) had a favorable reaction from participants; (2) provided a basis for the sought after learning (as measured by a performance test); and (3) produced expected behavioral changes in participants (increased amount of use).

Instructor-led training: Instructor provided personal guidance for a group by preparing, demonstrating, dictating, reinforcing, lecturing or by conducting other teacher centered activities (Hauger, 1986).

Interactive Video Instruction (IVI): A video program intentionally designed in segments, in which viewer responses to structured opportunities (menus, questions, timed
responses) influence the sequence, size, and shape of the program (Schwier, 1987). Interactive-video instruction usually includes the presence of a laboratory assistant to answer questions about machine operation or other non-substantive procedures.

**Performance test**: A determination whether or not a student or job candidate has the knowledge and skills required for job performance or successful completion of a training or education program in relation to a specified domain of knowledge and skills (Priestly, 1982).

**Personal computer**: A computer that is under the direct control of the end user to begin, end, interrupt and otherwise direct the operation. It is inclusive of the terms desktop computer, PC, Macintosh, and related generic and brand names.

**Post-training use**: The amount of use participants report they give the product on which they attended training as measured two to three weeks after the training is completed.

**Reaction**: The attitudes, opinions, feelings or responses immediately after the completion, whether subjective or not, of a learner to a training program or learning situation. The distinguishing feature of this type of evaluation is that it relies, to a large degree, on the subjective reports of the participants (Philips, 1983).

**Working adults**: Individuals that have a vocation and are attending training to acquire additional skills for their current profession and are not individuals who are developing primary vocational skills that will assist in initial qualification for an occupation.

**Implications of the Study**

This study was concerned with a comparison of instructor-led training and interactive video instruction for teaching working adults a personal computer application. Findings of the study, if significant, can expanded and the methodology replicated for:

1. comparison of other instructional methods;
2. for other product areas, such as
spreadsheets, graphics, or data management; and (3) for other populations. In addition, the sample used for this research could continue through a progression of follow-up studies in order to generate data for a longitudinal study.
II. REVIEW OF THE LITERATURE

The bottom line is that training is the most neglected area of computer buying. Who hasn't heard the horror stories of huge PC investments going to waste because businesses failed to properly train their employees? (Feil, 1990, p. 98).

Introduction

This chapter presents an exploration of the development of instructional technologies related to personal computers and a discussion of the need for evaluation of training related to personal computers applications.

The literature review was conducted electronically by searching data bases accessible through the Library Information Retrieval Service (LIRS) including Educational Resources Information Center (ERIC), Business Periodicals Index, Business Education Index, and Dissertations Abstracts International. A search strategy was developed and conducted with the assistance of a Kerr Library search consultant. This search identified over 700 pertinent abstracts which were reviewed for substantive and methodological relevance to this research.

There were no dissertations found in the literature search that directly addressed the research problem. However, a recently completed dissertation compared instructor-led training to manual or text-based training on a PC application as it related to learner preferences and cognitive style (Kluge, 1988). Another dissertation compared computer-assisted instruction (CAI) and teacher directed instruction for teaching sixth graders keyboarding (Hauger, 1986).
Technological Change and the Need for Continuing Professional Training

The search for enhanced productivity is a principal factor in the development of technology. Improved productivity is the intended outcome of technologies such as personal computer applications software. Word processing, spreadsheets, database management programs and other applications are intended to facilitate decision-making and record keeping--hopefully making work easier and enabling individuals to use their time in more productive ways. Computer usage is part of the daily routine of many individuals who are interested in utilizing the computer as a tool to facilitate their work and activities (Paxton & Turner, 1984).

Learning to use PC and related software is a key to applying the technology productively. The learning curve is typically longer than anticipated. One researcher writes:

Knowledge about computers and skills in using them does not come about naturally as does hair on the human head. This is a fact of life. And the learning process involved in acquiring knowledge and skill in the computer domain is, contemporarily at least, a very difficult one. (Carroll, 1984, p. 125).

In business and industry it is estimated that 12 to 15 million workers, or one-eighth of employed Americans, currently use a computer at work. Although millions of these people are being trained in the operation of computer systems, little scientific research has been conducted to investigate such training and the variables which impact upon its effectiveness (Kluge, 1988). As computing resources become more accessible, their use becomes feasible for a large population of non-specialists with little technical knowledge (Auld et al., 1981).

Training for the use of PC's and applications software has typically not been a part of the process of office automation, but there is an increasing recognition of the importance of PC training. Feil (1990, p. 98) suggests that: "In this era where people buy computer solutions instead of computer systems, relatively few realize that an adequate
training program is the solution to a host of productivity problems." In a 1989 survey of American businesses, basic computer skills ranked behind management skills, supervisory skills, technical skills, and communication skills in a ranking of training topics. However, some PC applications training was provided by 49.6 percent of the responding organizations (Geber, 1989).

Literature related to office automation and computing suggests a clear need for PC training. Unlike the original system programmer, today's typical user has little technical computer knowledge, and is unwilling to undergo extensive training prior to using the computer (James, 1981). Today's computer users are interested in using the PC immediately to improve productivity or accomplish a task. They are also not interested in learning programming. Using applications such as wordprocessors, desktop publishing, data base management systems and spreadsheets are their primary interest. Software developers are attempting to shorten the learning curve for PC users by developing applications that operate in what is known as a "graphical user interface" (GUI). These applications are often referred to as "Windows applications." When compared to DOS-based applications, Windows applications take less time to teach a person with little or no computer experience (Graggs, 1991).

The total dollars budgeted for formal training in 1989 by U.S. organizations of 100 or more employees was 44.4 billion dollars, a 12% increase over 1988. Nearly 80% of the amount of money destined for training budgets pays for training staff salaries (31.2 billion) and facilities and overhead (3.82 billion). The balance is committed to outside expenditures including seminars, conferences, outside services, hardware, custom materials, and off-the-self materials (Gordon, 1989).

Gordon (1989) estimated that since the survey concerned only organizations of 100 or more employees, and because it referred primarily to money specifically included in training budgets, that the total dollars actually spent on training may be 25% or more greater than the survey suggested. A figure for the amount of money spent specifically
on PC training could not be found in the literature. However, from the above data on the total amount spent on training, and knowledge that PC training was among the top six topics rated by the executives in the Gerber article it is fair to conclude that millions of dollars (if not billions) are spent annually on PC training.

Gordon states that it is not so much the amount of money we spend on training as the way we spend it that must be addressed. The question that matters, according to Gordon is, "Are you training your people effectively?" (Gordon, 1989, p. 39). This study is an inquiry into the comparative effectiveness of just two PC instructional methods, instructor led and interactive video training.

**PC Training Issues**

The need for continuing training caused by the pace of technological change is particularly evident in the arena of personal computer applications. Not only are there a plethora of computer programs available but many programs, particularly the market leaders, are frequently offering updated versions to their user base. Lotus 1-2-3 is an excellent example. Lotus Development Corporation has released Version 1 and 2 and recently Version 3. In addition each version had minor releases - Version 2.1 for example. WordPerfect has also had several releases during the last three or four years. Each release typically adds features that make it more competitive with other leading word processors.

With its leading position among PC applications, WordPerfect provides the researcher with an ample population of working adults. In addition, successful research in this area can be duplicated with parallel products in the areas of spreadsheets, database management, graphics, desktop publishing and other PC product areas.

According to Mills (1989), three major problem areas unique to the personal computer industry exist. First, there are a bewildering number of software products available for almost every business purpose. This often results in an unmanageable array
of products within a company for which users demand quality training and support. Second, most of these products, particularly the market leaders in each respective category, are updated with new versions frequently which often requires the continuous updating of courses used to teach them. Finally, both users and managers often have the unrealistic expectation that individuals can become experts after only a half-day of training while users with more experience complain about the basic nature and slow pace of training.

Hughes (1986) identified four additional questions regarding PC training. First, what type of training is best suited for training specific groups of users? Second, how long should the training program be? Third, do employees and managers at different levels of the organization require different types of training? Fourth, do employees and managers actually transfer the training they receive to their job environment?

This research explores the first and last of Hughes' questions. Other PC training issues include whether or not management supports and encourages training, fear of computers, gender of PC users, age of users, prior use of computers and access to equipment.

Management Outlook

How management views the need for PC training has an important effect on the entire process of automation in an organization. In a survey of 70 managers in business who use computers on the job, Hughes (1986) found that 56% indicated that the training they have received was inadequate, and 55% indicated that the computer training received was worse than training they had received in other areas. Twenty percent of the managers received no formal training. With such attitudes it is not surprising that managers often conclude incorrectly that users can become proficient and productive without intensive training.
One report estimated that formal training programs versus self-managed learning from manuals could result in a training cost reduction of over 50% (Churbuck, 1986). The savings results primarily from the reduction of training time between self-managed instruction and formal training (Kluge, 1988). Inadequate training or unsuccessful attempts at training can invalidate the investment into office automation (Scharer, 1983).

Fear

Fear of computers among working adults is another PC training issue. "Computerphobia," or the fear of computers, manifests itself by a reluctance to use computer equipment. Typically this anxiety is caused by a lack of facts about the capabilities of computers, a prior lack of success in training related to computers, and a lack of success in accomplishing practical tasks (Bloom, 1985).

Common fears associated with computers were identified in research (Bloom, 1985; Zuboff, 1982; Weinberg, 1971). These included:

- Breaking the computer;
- Making costly errors;
- Looking stupid;
- Receiving "beeps" and error messages;
- The computer being smarter;
- Inability to understand written documentation;
- Losing control;
- Lack of time to learn;
- Disappointment;
- Futility;
- Decision-making being taken over by machines;
- Conceptual skills replacing direct experience;
Computer rules replacing personal judgement;
Computer decisions being beyond challenge;
Loss of contact with colleagues;
Computer taking away part of job;
Computer replacing employees;
Computer threatening expertise or prestige;
Embarrassment by having to ask basic questions.

Little (1985) stated that initial success in training exercises, knowledge that safeguards exist to prevent accidental erasure of programs or data, and, for self-paced learning, the presence of someone knowledgeable are important factors in initial training of computer users.

Age

Research on the effect of age on learning to use a computer has produced inconsistent results. One study produced a positive relationship between age and execution time as well as age and first time errors (Gomez, Egan & Bowers, 1986). Another study demonstrated no age effect (Egan & Gomez, 1985).

Malcolm Knowles (1983), who is considered to be a leading expert on adult learning, found learning to use a computer frustrating. He suggested that providing a rationale for learning is necessary before adults will expend energy to learn about PC's. Knowles also suggested that learning activities be flexible for adult learners because of their various backgrounds and prior knowledge regarding computers.

Novice Users

The training of novice users of computers is also addressed in the literature with mixed results (Allwood, 1986; Paxton & Turner, 1984; Nowaczyk, 1984; Jagodzinski, 1983; Mayer, 1981; Eason, 1976; Eason & Damodaran, 1981). One study failed to establish any significant correlation between prior experience and success in learning to
use a text editor (Gomez, Egan & Bowers, 1985). Other studies (Nowaczyk, 1984; Rosson, 1984, 1985) found a correlation between prior experience and learning to use a computer.

Gender

The evidence is inconclusive as to whether men or women learn to use computers more effectively. There are studies (Fennema & Sherman, 1977; Zanca, 1979; Winkle & Mathews, 1982) that imply that mathematical subject matter is a male domain and that this attitude spills over into other "quantitative" areas, including computers. The results, however, are generally thought to be a reflection of cultural bias.

Hauger (1986) found in a comparison of computer-assisted instruction and teacher-directed instruction that females achieved higher keyboarding speeds than males and that females were more accurate than males, but that there was no difference in technique between females and males.

Kluge (1988) concluded that:

While anecdotal evidence on computer use, and empirical findings related to mathematics imply there to be a sex difference in computer attitudes and aptitudes, such evidence is inconclusive. Further empirical research in a variety of situations is needed to further investigate this relationship. (p. 61).

It is evident from the literature that, although considerable research has been done regarding computer training in the areas of gender, novice users, age, fear, and management outlook, there is a general lack of conclusiveness in the literature related to teaching working adults how to use personal computers.

Delivering PC Training

How to deliver PC training is the subject of much discussion in the literature. Some trainers prefer only teacher-directed instruction. Others argue that using computer technology itself to deliver training is more effective and considerably cheaper.
Personal Computer training methods can be grouped into two major categories: group-paced and self-paced. Group-paced methods include lectures, conferences, workshops, videotapes, panel discussions. Self-paced methods include manuals (text), programmed instruction, disk tutorials, computer-aided instruction, computer games, videotaped modules, audiotape with supplements, and slides or slide/tape programs (Feil, 1990).

Self-Paced Instruction

Self-paced methods have as a predominant characteristic the control by the student of the pace of instruction. Typically students interact with previously prepared modules which require mastery before the student proceeds (Bailey, 1982). Group-paced instructional methods, on the other hand, are characterized by the formation of students into a single group that moves through the material together and at a common pace.

Mixed results have been obtained when programmed instruction has been compared to conventional lecture. In 20 studies which compared programmed instruction to conventional lecture in an industrial setting, seven showed at least a 10% higher rate of learning with programmed instruction, and the remaining showed no practical difference. Training time was less with programmed instruction in 18 of the studies. The authors of the study conclude that although programmed instruction is an effective technique, the results have been mixed (Nash et al, 1971).

In 1986 lectures were the most common vehicle for delivering training barely edging out videotapes. In 1987 the two switched positions, and videotape instruction has held a narrow edge in the succeeding two years (Geber, 1989).

In a 1989 survey of training professionals, 11.4% of the respondents used interactive video to deliver training to employees (Oberle, 1989). Interestingly, as the size of the organization drops (from 100 or greater employees to 50 or more) the
proportion using interactive video for training increases. On the other hand, of U.S. organizations with 10,000 or more employees, 34% used interactive video for training.

Programmed instruction was rated most effective and lecture ranked as least effective for acquisition of knowledge and record retention of nine methods. However, lecture methods have been found more effective for acquiring knowledge and for participant acceptance (Carroll et al., 1972). Printed manuals are the medium of choice among traditional data processing professionals and software companies (Kazlaukas & McCrady, 1985; Churbuck, 1986; Scharer, 1983).

Self-paced courses are useful either for experienced users who understand the language of PC's or for beginners who intend to use them as an introduction and preparation for other training. Unfortunately, the quality of self-paced courses ranges from acceptable to terrible, and they need careful evaluation. Also, vendors of self-paced courses face the same problem as end users of trying to remain current with new software and with updated versions of the older programs (Mills, 1987). Video courses provide another alternative. Most videotape courses have the students watch a video and stop it at various points to do exercises on the PC.

Videodisc is a more recent development. Some videotape courses attach to a PC and provide interaction between the use of the PC and the information presented by the videotape. Videodisc requires a large initial investment for equipment, and there are only a limited number of courses available (Mills, 1987). As a consequence, video disk is not widely used, with the possible exception of very large organizations.

In a study of two different methods of teaching typing to elementary students, Sorensen (1971) concluded that students in a videotape program grew tired of learning on their own with no external motivation by the teacher and that they also probably did not do the amount of keyboard practice they were supposed to do. Another study comparing self-directed learning to teacher-directed instruction showed no significant differences between groups (Kline, 1971).
Interactive video can exist at many levels of interactivity and quality. The most common form of interactive video is linear video that is integrated with a text based training program. Nearly all schools as well as most homes and businesses have video tape playback capability. The technology of interacitve video disk (IVD), although not extensively installed in industry, offers even greater capability for training customized for the individual watching it. Interactive video disk is effective as a training tool because of its ability to simulate situations and possible results (Lee, 1991). When combined with computer-assisted instruction the training takes on qualities of an "intelligent" system.

Several studies have reported benefits of interactive video and computer-based training. Kearsley and Hillelsohn (1984) reported that respondents listed improved job performance, reduced training time and cost, increased control and standardization, and decentralization of training as expected benefits of CBT. Dalton (1988) reported that a side benefit of interactive video disk was increased cooperative learning among students. Blatnik (1988) reported that although IVD required more teacher preparation time there was significantly more student comprehension than textbook instruction.

Self-paced computer training can take many forms. Most of it is interactive to some degree. The broadest definition of interactive means that the user is actually working through an exercise while the training is taking place.

**Group-Paced Instruction**

Instructor-based training offers flexibility, adaptability and responsiveness, and many trainers believe that no other method is as effective. (Pepper, 1986). Live demonstrations and personal interaction are the most useful elements of instructor-led training (Scharer, 1983). Callaghan (1989) suggested that complex instructions are more effectively presented through demonstration than as written text. Instructor-based training can be affective as well as cognitively beneficial for students (Kazlauskas &
McCrady, 1985). Cognitive learning in this context would be the learning of computer tasks, while affective learning relates to attitudes and fears users might have regarding computers. As noted above, fear of computers is a major issue of new PC users.

The principal disadvantages of instructor-led training focus on the differences in teaching ability and personality characteristics of the instructor, on the quality and consistency of delivery, on the logistics of scheduling and location, and on the variety of interests, backgrounds, prior experience and other student criteria. Content and timing of training sessions often fails to coincide with the learning needs of employees when using an instructor-led approach (Hall, 1985).

Classroom instruction accompanied with laboratory exercises is another common method of delivering PC training. Classrooms, however, require a large investment in facilities, equipment, software, and course development (Mills, 1987).

The literature suggests there is a need for additional research. In many cases training professionals have little idea which methods are effective (Hauger, 1986; Kluge, 1988; Feil, 1990).

Comparing Instructional Effectiveness

This research evaluates reaction, performance, and post-training use of study subjects. Reaction was determined by surveying the attitudes, opinions, feelings and other responses immediately after the completion of training. Post-training use was measured in this study by the number of hours per week the subject used the product for which they received training. Performance indicators specify the measurable evidence necessary to prove that a planned effort has achieved the desired result.

Reaction was obtained through the use of a short questionnaire after completion of the training. Post-training use was obtained through the use of a survey when subjects returned for followup training. Performance was obtained through the administration of a performance test on a simulated job task.
Performance measures have two uses: one proactive--to identify what should be accomplished--and the other retrospective--to provide criteria for determining success or failure. A training objective that contains a performance indicator should include (Kaufman, 1988):

(a) a clear, unambiguous statement of required results;
(b) precise criteria to measure actual results;
(c) who or what will demonstrate the intended results;
(d) the conditions under which the results or performance will be observed.

Two types of performance indicators exist: (a) results-oriented indicators identify measurable performance and results including individual contributions as well as organizational results and consequences; (b) implementation-oriented indicators identify fidelity of activity and compliance in the application of methods, resources, and approaches (Kaufman, 1988).

Bailey (1982) suggested that performance is often confused with behavior. Performance, however, is a result while the actions leading to the result are behavior. Two common standards of performance are quality and quantity. Bailey identified four aspects of performance evaluation: skill development time (training time), task completion time, accuracy, and user satisfaction. Skill development and task completion are quantitative measures while accuracy is a qualitative measure. Satisfaction is usually measured through interviews or questionnaires.

**Linking Technology and Training with Productivity**

Productivity has been a buzzword of the 1980's and in all probability will continue in popularity throughout the next decade. Given the rapidity of technological change and the decreasing "half-life" of professional knowledge and skills, professional education and training will play a key role in the quest for improved productivity.
Computing is being adopted as a basic subject in primary, secondary, and post-secondary education and has great popularity in professional training. Coombs and Alty state that the demand for instruction is occurring at a time when little is known either about the nature of computing skills, or about effective methods of teaching them. They conclude that there is therefore an urgent need for a substantial research effort in this area (Combs & Alty, 1981).

More recently, Hauger (1986) investigated the keyboarding performance of sixth graders resulting from two different teaching methods -- computer-assisted instruction and teacher-directed instruction. Hauger found the research inconclusive as to whether computer-assisted instruction was effective. She concludes that CAI does not appear to be equally effective with all populations. Being more effective at the elementary level, less so at the secondary level, and least effective in higher education. No data were found on working adults as a research population.

In four of nine comparative studies on the topic the subjects were college students. In one other the subjects were military students. In nearly all of these studies the number of student subjects was eight to 10 times greater than in the studies of working adults. For example, studies that had students as subjects had sample sizes of 300, 326, 286 and 155. In the other studies there were 33 adult women, 41 adult women, 12 secretaries, and 122 computer users (Kluge, 1988). Hauger's (1986) subjects were 132 sixth graders in a middle school.

This study sought to expand the research in PC instructional methods by examining subject performance in the personal computer application area of wordprocessing by using an evaluation methodology that included reaction, performance and post-training use and by using a working adult population.
III. METHODOLOGY

Introduction

This chapter presents the procedures that were employed in order to determine:
(a) whether an instructor-led training program produced more favorable end-of-training
reactions than an interactive video program, (b) whether students in an instructor-led
group scored higher on end of training and follow-up performance tests, and (c) whether
the instructor-led training produced more post-training use of WordPerfect than the
interactive video program.

This research is based on the following:

1. That there is a need to comparatively evaluate various instructional approaches
   for teaching PC applications in order to determine the most effective methods.

2. That such evaluation needs to be based on more comprehensive evaluative
   models such as those proposed by Brinkerhoff (1987), Phillips (1983) and
   Bushnell (1990). These approaches include reaction, learning and behavioral
   changes as evaluation elements.

3. That comparative evaluation is particularly important in areas where the
   individuals receiving the training are working professionals because most of
   the research in this area to date has been done with subjects from traditional
   academic populations.

4. That research regarding technological delivery of instruction is especially
   important because of its contemporary popularity, its rapidly expanding use,
   and the present lack of a clear understanding of its effectiveness.
Hypotheses

The following null hypotheses were tested for significance at the .05 level:

Hypothesis 1

There is no significant difference in reaction to the training between the interactive video trained group and the instructor-led group.

Hypothesis 2

There is no significant difference in end of training performance between the interactive video trained group and the instructor-led group.

Hypothesis 3

There is no significant difference in post-training use between the interactive video trained group and the instructor-led group.

Hypothesis 4

There is no significant difference in performance after two to three weeks between the interactive video trained group and the instructor-led group.

Research Design

Evaluations of two groups of working adults were administered to students after completion of the instructor-led and the interactive video programs. The control group received instructor-led training and the experimental group received interactive video instruction.

Control Group

Subjects in the control group were given introductory training in how to use the PC application WordPerfect. The instructor-led training was conducted in groups of eight to 10 students. This represents a typical class size for this type of training and the recommended class size for an Authorized Training Center (ATC) by software publishers such as Microsoft. The length of the training was approximately five and one-half hours. The instructor-led group performed all exercises as a group, although the instructor
occasionally gave individual assistance to a student when necessary. The instructor-led training was conducted by an instructor experienced in the use of PC's and WordPerfect.

**Experimental Group**

Subjects in the experimental group were trained to use WordPerfect through the use of an interactive video program. The length of the training was between three and five hours, depending on the pace of each student.

A laboratory assistant was present at IVI sessions as it is common practice and a practical necessity to have someone familiar with operational procedures of video equipment, computers and printers to assist the students. The laboratory assistant did not direct the instruction, but was available to answer questions on procedures, machine operations, and to monitor student performance.

**Population, Subjects and Recruitment**

**Population**

The population for the study consisted of working professionals interested in learning to use WordPerfect. Individuals working full or part-time were considered working professionals. Full-time students were not considered working professionals and were not part of the population from which the sample was drawn.

**Subjects**

There were 111 individuals in the original sample of which half were randomly assigned to each group. There were 11 individuals who subsequently dropped out before the first training session. Subjects for the study were 100 working adults with 53 of the individuals in the instructor-led training group and 47 in the interactive video training group. The original sample consisted of 17 men and 94 women. Of the 11 that dropped out, eight were men and three were women. Thus of the original 17 men, or 47.1%, dropped out of the study before the first training while only three out of 94, or 3.2%, of the women dropped out. On the surface, it might appear that the sample was too heavily
weighted toward women. However, examination of quarterly reports of Northwest Computer Learning Center (NWCLC, 1991) indicated that 71% of all clients trained by the organization were women and 83.8% were women in the wordprocessing category (Table 1.1). Thus, the sample as drawn, does not appear to be skewed excessively toward women in relationship to the probable population for such training from which the sample was drawn.

Recruitment

Subjects were recruited by using promotional strategies such as direct mail brochures and solicitation of subjects through direct contact with training departments. The researcher had access through Northwest Computer Learning Center to public and private agencies that have attended PC related training or have expressed an interest in PC related training. Agreement to participate in the study was reached with staff at Oregon Executive Department, Oregon Department of Corrections, Oregon State Marine Board, and Oregon Department of Revenue. A letter describing the training was mailed to agency managers and is attached as Appendix H. Training was conducted at Northwest Computer Learning Center facilities in Salem and Portland.

The research design was submitted to the Board for the Protection of Human Subjects at Oregon State University for approval. Approval was granted to conduct the research as proposed (Appendix G).

Materials and Instrumentation

The following instruments were used in collecting the data for this study:

1. Demographic Questionnaire;
2. Training Reaction Questionnaire;
3. Performance Tests A and B;
4. Follow-up Questionnaire.
Demographic Questionnaire

Prior to beginning the training each subject was asked to complete a questionnaire to collect demographic information and data regarding skills and knowledges pertinent to the use of WordPerfect such as prior use of other word processing programs. The demographic questionnaire is attached as Appendix A. This questionnaire is modeled after a questionnaire designed by Zemke (1985) in *Computer-Literacy Needs Assessment*.

Training Reaction Questionnaire

Reaction is the attitudes, opinions, feelings and other responses immediately after the training. An evaluation (reaction) sheet was given to each student at the conclusion of their training to assess their immediate response to the content, delivery and other aspects of the training. Implicit in this instrument was an attempt to gather subjective responses. The Workshop Evaluation (reaction) is attached as Appendix B. This instrument is modeled after an evaluation instrument developed by the Training Department at Microsoft Corporation.

Performance Test

Performance for both the groups was measured by having subjects complete a series of typical tasks pertinent to WordPerfect. These tasks are:

1. Starting the program;
2. Using the menus;
3. Using special keys;
4. Entering text;
5. Editing text;
6. Formatting text;
7. Saving a document;
8. Recalling a file;
9. Printing a document; and
10. Exiting the program.
The performance test was designed according to standards recommended by Priestley (1982) in *Performance Assessment in Education & Training: Alternative Techniques*. The style of test chosen to measure performance was a "work-sample" test. This style of performance test was chosen because selection tests for typist, stenographers, and keypunchers most often require work-samples. According to Priestly (1982, p. 71), "the key to the usefulness of work-sample tests . . . . is the facility with which actual job skills required can be identified and assessed in an efficient manner."

According to Priestly, work-sample tests: (a) measure actual performance in realistic settings, thus exhibiting high face validity; (b) measure skills not readily measurable by any other method; and (c) provide for direct observation of performance.

Priestly (1982) suggested the following steps in the development of a work-sample test:

1. Specify performances by giving a domain of performance skills and state each one as a performance objective or task statement.
2. Analyze the task. Break the task into measurable identifiable components required for its completion.
3. Construct an assessment form such as a checklist or rating scale, listing each step or characteristic and a numerical scale for scoring it.
4. Develop instructions for the examinee in order to standardize the procedures.
5. Specify conditions, equipment, and materials. Tests given under varying conditions will not produce comparable results.

The performance tests administered in this research consisted of the students creating a basic business letter at the completion of initial training and a basic business memorandum when they returned for follow-up training. This is a task pertinent to actual job skills of working adults interested in using WordPerfect. The performance test was scored by the examinee based on a self-assessment of the difficulty of each competency.
The second performance test was administered at the beginning of a follow-up training session conducted about two to three weeks after the initial training. The second performance test was similar in content and difficulty to the first. These performance tests are attached as Appendix C and D.

Follow-up Questionnaire

Post-training use was determined through the use of a follow-up survey administered at the beginning of the second training session. Each subject who returned for the second training session completed the Follow-up Questionnaire to assess the amount and nature of use of WordPerfect. The follow-up questionnaire also had several questions about WordPerfect functions (knowledge test) designed to assess retention of concepts from the first training session. The Follow-up Questionnaire is included as Appendix E.

Instructional Materials

The interactive video program used in the research was chosen by selected members of the Executive Department Technology Learning Center (TLC) Advisory Group and additional appointed training directors. The panel evaluated a recommended IVI program to insure that it adhered to standards of interactive video design as recommended by Iuppa (1984) in A Practical Guide to Interactive Video Design and that the IVI program represented the type of programs that are typically available to working professionals interested in learning WordPerfect. The program that was selected for use in the study was Volume 1 and 2 of WordPerfect 5.1 by Anderson Soft-Teach. Agreement to provide the video programs and to cooperate in the research was granted by Anderson SoftTeach (See Appendix G). The coordinator for the interactive video training was instructed to inform participants of their participation in a research project and to show participants how to operate the video and computer equipment. The
coordinator was also instructed to answer participant questions when asked in order to insure that participants completed the program.

Instructional material including student handouts and an instructor's guide were developed for the instructor-led group. Classroom materials were modeled after the IVI program in the areas of course objectives, topics, exercises and sequence in order to insure consistency of content with the IVI program. A copy of the instructor-led training material is available from the researcher. The classroom instructor was directed to inform participants of their involvement in a research project, to proceed through the material in sequence as indicated in the handouts, and to direct the exercises as necessary to insure the group completed the training.

**Pilot Study**

**Design**

A pilot study was conducted with a group of 12 subjects to determine the internal consistency and reliability of the performance test and questionnaires. The instruments and procedures were determined reliable in that they individually and collectively appeared to provide a consistent and accurate measure of the reactions, performance and post-training use relative to the training.

**Purpose**

The purpose of the pilot study was to confirm that the data-gathering effort of the research would be valid and reliable and that the data would be usable. Validity means that the tests measure what they purport to measure. Reliability suggests that equivalent scores would be obtained on repeated administrations. Usability means that the instruments can quickly and easily be administered.
The following questions, according to Bushnell (1990), need to be addressed as a result of the pilot study:

1. Is the information collected needed?
2. Is the information collected answering the key questions raised?
3. Are any of the evaluation procedures disruptive to the education activities?
4. Are the analytic procedures appropriate?

As a result of the pilot study a question was added to the demographic survey regarding an individual's classification as union represented or unrepresented. This was done at the request of the training coordinators in an attempt to study differences between individuals with these classifications. Also, when discussions began with coordinators from the agencies that were interested in participating in the study it was indicated to the researcher that most of the individuals in the sample would be receiving their copy of WordPerfect about the time the first training session commenced. At the time of the pilot study it was apparent that many of these individuals did not yet have WordPerfect installed on their PCs. A question was therefore added to the instruments that queried participants' expected use of WordPerfect.

**Technical Services**

Technical services of the Oregon State University Statistics Department, Consulting Services section, and the Survey Research Center were consulted. In addition, a statistician at Oregon State University has provided technical advice to the researcher on questions regarding validity and reliability of the research instruments and on statistical procedures.

**Variables**

A. The independent variables in this study are the two instructional approaches.

B. The dependent variables are reaction, level of performance, and amount of post-training use.
C. Variables selected for analysis between the two groups are age, gender, occupational group, level of education, type of organization and prior use of a PC.

**Statistical Analysis**

Statistical analysis for this research was performed on a personal computer using the Statistical Package for the Social Sciences, PC Version (SPSS/PC+). Descriptive statistics were prepared for the dependent variables (reaction, performance, and post-training use) and covariates (age, gender, occupation, education, organization and prior use). Frequency distributions were compiled for the results of the questionnaires.

Differences between instructor and video trained groups with respect to reaction, performance and post-training use were measured with t-tests. Critical interval was .05 (t < .05).

Tests for relationships between independent variables and dependent variables were performed using Chi-square analysis. Critical interval was .05 (p < .05).
IV. FINDINGS

Summary

The purpose of this study was to determine whether instructor-led training of WordPerfect to working adults results in significantly different reaction, performance and post-training use than interactive video training. The purpose of this chapter is to report the results of the methodology that was developed and executed to explore these questions. Included in this chapter are summary descriptive data for the entire sample as well as comparative data for the instructor-led and interactive video trained groups.

Most importantly, this chapter includes results of statistical analyses performed regarding Hypotheses One, Two, Three, and Four. Findings are presented in the order the instruments were administered.

Demographic Survey Results

There were 100 individuals in the entire sample for the first training session. Fifty-three were randomly assigned to the instructor-led group and forty-seven were randomly assigned to the interactive video trained group. Two individuals in the video group did not complete the training and are reported as "missing." The demographic survey is attached as Appendix A.

Company Type

Ninety-four percent of the total sample indicated that they were from government agencies, one percent from non-profit organizations, three percent from legal organizations and two percent did not complete the question. Comparison of the instructor-led group and the interactive video trained group indicate that the company type distribution was comparable between the groups with 94.3% of the instructor-led
group and 97.8% of the video trained group indicating they were from government agencies.

**Position**

Sixty-eight percent of the sample indicated that their position was secretarial, administrative assistant or support staff. Comparison of the two groups indicated that 62.3% of the instructor-led group were secretarial, administrative assistant or support staff and that 77.8% of the interactive video group choose this response. Eighteen percent of the entire sample answered the question on position as professional, six percent as technical, and four percent as management.

<table>
<thead>
<tr>
<th>Table 4.1 Position - Entire Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Secretary/Admin. Asst.</td>
</tr>
<tr>
<td>Professional</td>
</tr>
<tr>
<td>Technical</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>Supervisory</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>(Missing)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Number of Employees**

Fifty percent of the sample indicated that they were from organizations of 100 or more employees while 30% indicated that they were from organizations of fewer than 25 employees.
Table 4.2 Organizational Size - Entire Sample

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-25 Employees</td>
<td>30</td>
<td>30.0</td>
<td>31.3</td>
<td>31.3</td>
</tr>
<tr>
<td>26-50 Employees</td>
<td>12</td>
<td>12.0</td>
<td>12.5</td>
<td>43.8</td>
</tr>
<tr>
<td>51-100 Employees</td>
<td>4</td>
<td>4.0</td>
<td>4.2</td>
<td>47.9</td>
</tr>
<tr>
<td>100+ Employees</td>
<td>50</td>
<td>50.0</td>
<td>52.1</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 96  Missing Cases 4

Crosstabulation by number of employees is illustrated in Table 4.3. There were no apparent trends in the data regarding company size. No significant differences between the groups were found.

Table 4.3 Crosstabulation by Group and Number of Employees in Organization

<table>
<thead>
<tr>
<th>Number of Employees in Organization</th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>1-25</td>
<td>32.7</td>
<td>29.5</td>
</tr>
<tr>
<td>26-50</td>
<td>7.7</td>
<td>18.2</td>
</tr>
<tr>
<td>51-100</td>
<td>3.8</td>
<td>4.6</td>
</tr>
<tr>
<td>100+</td>
<td>55.8</td>
<td>47.7</td>
</tr>
<tr>
<td>Column Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 4

Gender

Of those individuals answering the question on gender, 90.8% were female and 9.2% male. Crosstabulation results are shown in Table 4.4.

Table 4.4 Crosstabulation by Group and Sex

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Male</td>
<td>9.4</td>
<td>8.9</td>
</tr>
<tr>
<td>Female</td>
<td>90.6</td>
<td>91.1</td>
</tr>
</tbody>
</table>

Percent of Entire Sample

Number of Missing Observations = 2
Since the ratio of men to women was so heavily oriented toward women data were collected from a professional training organization and compared to the sample. Table 4.5 shows the percentage breakdown by product category for individuals attending regularly scheduled classes of Northwest Computer Learning Center (NWCLC).

Table 4.5 PC Students by Gender at NWCLC

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>32.4</td>
<td>67.6</td>
<td>23.6</td>
</tr>
<tr>
<td>Word processing</td>
<td>16.2</td>
<td>83.8</td>
<td>36.5</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>37.5</td>
<td>62.5</td>
<td>11.1</td>
</tr>
<tr>
<td>Database</td>
<td>46.2</td>
<td>53.8</td>
<td>22.6</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>5.6</td>
<td>94.4</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Percent of Total</strong></td>
<td>28.5</td>
<td>71.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Seventy-one percent of the total number of people attending workshops at NWCLC during the first quarter of 1991 were women. In the word processing category the distribution was even more heavily weighted toward women with 83.8% attending being female. In the original sample for this research project (before dropouts) 94 out of 111, or 84.7% of the individuals were women. Thus, the sample for the research is not necessarily unrealistically skewed toward women given the distribution by gender that occurs normally in professional practice.

**Education**

Table 4.6 shows the distribution of responses on education level attained.

Table 4.6 Education - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Graduate</td>
<td>28</td>
<td>28.0</td>
<td>28.6</td>
<td>28.6</td>
</tr>
<tr>
<td>Some College</td>
<td>31</td>
<td>31.0</td>
<td>31.6</td>
<td>60.2</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>13</td>
<td>13.0</td>
<td>13.3</td>
<td>73.5</td>
</tr>
<tr>
<td>4 Year Degree</td>
<td>18</td>
<td>18.0</td>
<td>18.4</td>
<td>91.8</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>8.0</td>
<td>8.2</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 98
Nearly 70% of the entire sample had more than a high school education.

**Age**

There were no significant differences found between the instructor-led and the video group regarding age (Table 4.7) (Chi Square = 2.79, df = 4, p = .5922).

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or Under</td>
<td>4.7</td>
<td>7.7</td>
</tr>
<tr>
<td>26 to 35</td>
<td>27.8</td>
<td>28.1</td>
</tr>
<tr>
<td>36 to 45</td>
<td>46.5</td>
<td>30.8</td>
</tr>
<tr>
<td>46 to 55</td>
<td>14.0</td>
<td>23.1</td>
</tr>
<tr>
<td>56 to 65</td>
<td>7.0</td>
<td>10.3</td>
</tr>
<tr>
<td>Over 65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent of Entire Sample

Number of Missing Observations = 16

**Prior Use of a Personal Computer**

Regarding prior use of a personal computer only 20.4% reported none or very little prior use while 79.5% reported some or extensive prior use (Table 4.8).

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>8</td>
<td>8.0</td>
<td>8.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Very Little</td>
<td>12</td>
<td>12.0</td>
<td>12.2</td>
<td>20.4</td>
</tr>
<tr>
<td>Some</td>
<td>56</td>
<td>56.0</td>
<td>57.1</td>
<td>77.6</td>
</tr>
<tr>
<td>Extensive</td>
<td>22</td>
<td>22.0</td>
<td>22.4</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total 100 100.0 100.0

Valid Cases 98

**Acquaintance with Word Processing**

Of the entire sample, 50.5% reported that they were capable of producing documents on a word processor and an additional 17.5% indicated that the felt they were quite skilled at word processing (Table 4.9).
Table 4.9 Acquaintance with Word Processing - Entire Sample

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>11</td>
<td>11.0</td>
<td>11.3</td>
</tr>
<tr>
<td>Know what it is</td>
<td>7</td>
<td>7.0</td>
<td>7.2</td>
</tr>
<tr>
<td>Used it before</td>
<td>13</td>
<td>13.0</td>
<td>13.4</td>
</tr>
<tr>
<td>Can produce documents</td>
<td>49</td>
<td>49.0</td>
<td>50.5</td>
</tr>
<tr>
<td>Quite skilled</td>
<td>17</td>
<td>17.0</td>
<td>17.5</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Valid Cases 97 Missing Cases 3

Expected Use of WordPerfect

Students in the two groups were asked four times throughout the study to complete a question regarding expected use of WordPerfect. Regarding their expectation of future use of WordPerfect, 43.8% of those people responding to the question from the entire sample thought they would use it frequently and nearly one-fourth felt that their use would be extensive (Table 4.10).

Table 4.10 Expectation of Use - Entire Sample

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Little</td>
<td>2</td>
<td>2.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Some</td>
<td>29</td>
<td>29.0</td>
<td>30.2</td>
</tr>
<tr>
<td>Frequently</td>
<td>42</td>
<td>42.0</td>
<td>43.8</td>
</tr>
<tr>
<td>Extensively</td>
<td>23</td>
<td>23.0</td>
<td>24.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Valid Cases 96 Missing Cases 4

Access to a PC

Over three-fourths of the individuals in the entire sample responding to the question on access to a computer indicated that they had a PC on their desk at work. Another five percent indicated that they owned their own PC, and only four percent indicated that they currently did not have access to a PC (Table 4.11).
### Table 4.11 Access to a PC - Entire Sample

<table>
<thead>
<tr>
<th>Access to a PC</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access to a PC</td>
<td>4</td>
<td>4.0</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Own my own PC</td>
<td>5</td>
<td>5.0</td>
<td>5.1</td>
<td>9.2</td>
</tr>
<tr>
<td>PC on my desk at work</td>
<td>74</td>
<td>74.0</td>
<td>75.5</td>
<td>84.7</td>
</tr>
<tr>
<td>Plan to purchase a PC soon</td>
<td>2</td>
<td>2.0</td>
<td>2.0</td>
<td>86.7</td>
</tr>
<tr>
<td>No response</td>
<td>13</td>
<td>13.0</td>
<td>13.3</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 98

### Demographic Survey Summary

Table 4.12 below shows the result of a comparison of the instructor-led group and the interactive video trained group on the items on the demographic survey. All items were non-significant (p > .05).

### Table 4.12 Demographic Survey Chi-Square Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Chi-Square</th>
<th>D.F.</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Company type</td>
<td>1.07</td>
<td>2</td>
<td>.59</td>
</tr>
<tr>
<td>2. Position</td>
<td>8.01</td>
<td>5</td>
<td>.16</td>
</tr>
<tr>
<td>3. Number of employees</td>
<td>2.49</td>
<td>3</td>
<td>.48</td>
</tr>
<tr>
<td>4. Sex</td>
<td>.00</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>5. Education</td>
<td>4.55</td>
<td>4</td>
<td>.34</td>
</tr>
<tr>
<td>6. Age</td>
<td>2.79</td>
<td>4</td>
<td>.59</td>
</tr>
<tr>
<td>7. Prior use</td>
<td>1.90</td>
<td>3</td>
<td>.59</td>
</tr>
<tr>
<td>8. Acquaintance with word processing</td>
<td>7.70</td>
<td>4</td>
<td>.10</td>
</tr>
<tr>
<td>9. Expectation for using WP</td>
<td>1.88</td>
<td>3</td>
<td>.59</td>
</tr>
<tr>
<td>10. Access to a computer</td>
<td>.45</td>
<td>4</td>
<td>.98</td>
</tr>
<tr>
<td>11. Position Classification</td>
<td>.40</td>
<td>2</td>
<td>.82</td>
</tr>
</tbody>
</table>

*Significance where p < .05

The lack of significant differences on the demographic survey suggests that the random assignment process was successful and that interactive video trained group and that the instructor-led group were comparable.
Performance Test One Results

There were 10 components on the performance test given at the end of the first training session (Appendix C). Table 4.13 shows the distribution of scores.

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Completed Easily</th>
<th>Completed Struggled</th>
<th>Struggled Somewhat</th>
<th>Asked for Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start WordPerfect</td>
<td>46.8</td>
<td>24.5</td>
<td>13.8</td>
<td>14.9</td>
</tr>
<tr>
<td>2. Enter and position date</td>
<td>53.8</td>
<td>29.0</td>
<td>7.5</td>
<td>9.7</td>
</tr>
<tr>
<td>3. Enter inside address</td>
<td>82.6</td>
<td>12.0</td>
<td>3.3</td>
<td>2.2</td>
</tr>
<tr>
<td>4. Edit inside address</td>
<td>69.6</td>
<td>19.6</td>
<td>8.7</td>
<td>2.2</td>
</tr>
<tr>
<td>5. Type text</td>
<td>77.2</td>
<td>13.0</td>
<td>6.5</td>
<td>3.3</td>
</tr>
<tr>
<td>6. Save document</td>
<td>60.2</td>
<td>21.5</td>
<td>9.7</td>
<td>8.6</td>
</tr>
<tr>
<td>7. Exit WordPerfect</td>
<td>64.5</td>
<td>23.7</td>
<td>8.6</td>
<td>3.2</td>
</tr>
<tr>
<td>8. Start WordPerfect and retrieve</td>
<td>64.8</td>
<td>17.6</td>
<td>9.9</td>
<td>7.7</td>
</tr>
<tr>
<td>9. Print</td>
<td>65.2</td>
<td>21.3</td>
<td>7.9</td>
<td>5.6</td>
</tr>
<tr>
<td>10. Exit the program</td>
<td>63.3</td>
<td>24.4</td>
<td>5.6</td>
<td>6.7</td>
</tr>
</tbody>
</table>

The table above shows that most of the sample completed or completed easily the various aspects of the performance test. Table 4.14 below shows the results of a comparison of the video group and instructor-led groups on Performance Test One.

<table>
<thead>
<tr>
<th>Item</th>
<th>Chi-Square</th>
<th>D.F.</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start WordPerfect</td>
<td>2.02</td>
<td>3</td>
<td>.56</td>
</tr>
<tr>
<td>2. Enter date</td>
<td>3.09</td>
<td>3</td>
<td>.37</td>
</tr>
<tr>
<td>3. Enter inside address and salutation</td>
<td>1.31</td>
<td>3</td>
<td>.72</td>
</tr>
<tr>
<td>4. Type the text of letter</td>
<td>4.02</td>
<td>3</td>
<td>.25</td>
</tr>
<tr>
<td>5. Edit the inside address</td>
<td>2.31</td>
<td>3</td>
<td>.50</td>
</tr>
<tr>
<td>6. Save the document</td>
<td>2.50</td>
<td>3</td>
<td>.47</td>
</tr>
<tr>
<td>7. Exit the program</td>
<td>3.91</td>
<td>3</td>
<td>.27</td>
</tr>
<tr>
<td>8. Restart the program and retrieve</td>
<td>.40</td>
<td>3</td>
<td>.93</td>
</tr>
<tr>
<td>9. Print the document</td>
<td>2.26</td>
<td>3</td>
<td>.51</td>
</tr>
<tr>
<td>10. Exit the program and shutdown the PC</td>
<td>2.03</td>
<td>3</td>
<td>.56</td>
</tr>
</tbody>
</table>

*Significance where p < .05

Both groups rated all items on Performance Test One similarly.
Reaction to the First Training Session

Individuals participating in the study were asked to complete an evaluation of the training at the conclusion of the first session (Appendix B). This instrument was designed to collect data regarding their reaction to the training. Over 60% of the entire sample indicated they felt the training was "excellent." An additional 38% indicated they felt the training was "good." Only one individual indicated that the training was fair and there were no respondents rating the training as poor. These responses indicate that a high value was placed on the training by the entire sample.

Table 4.15 Overall Rating of Training Session One - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>59</td>
<td>59.0</td>
<td>60.8</td>
<td>60.8</td>
</tr>
<tr>
<td>Good</td>
<td>37</td>
<td>37.0</td>
<td>38.1</td>
<td>99.0</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
<td>1.0</td>
<td>1.0</td>
<td>100.0</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 97  Missing Cases 3

When the results of this instrument are crosstabulated by instructor-led and interactive video groups highly significant differences in overall rating of the training are apparent. Seventy-eight percent of the instructor-led group rated the training as excellent while only 40% of the video group indicated an excellent rating. Table 4.16 shows the distribution of scores on the overall rating question of the reaction sheet to the first training session (Chi Square = 15.62, df = 2, p = .0004).

Table 4.16 Overall Rating of Training by Group by Percent

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Excellent</td>
<td>78.8</td>
<td>40.0</td>
</tr>
<tr>
<td>Good</td>
<td>21.2</td>
<td>57.8</td>
</tr>
<tr>
<td>Fair</td>
<td>0.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Percent of Entire Sample 53.6  46.4

Number of Missing Observations = 3
Similarly, on the second question on this instrument, nearly 95% of the entire sample felt that the clarity and usefulness of the course materials was "good" or "excellent." However, 55% of the instructor-led group rated the clarity and usefulness of the course as excellent compared to 42% of the interactive video group (Chi Square = 6.70, df = 2, p = .035). Table 4.17 shows the responses for the entire sample. Table 4.18 shows a comparison of the ratings of the two groups to the question on clarity and usefulness of course materials.

Table 4.17 Clarity and Usefulness of Course Materials

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>48</td>
<td>48.0</td>
<td>49.5</td>
<td>42.9</td>
</tr>
<tr>
<td>Good</td>
<td>44</td>
<td>44.0</td>
<td>45.4</td>
<td>95.9</td>
</tr>
<tr>
<td>Fair</td>
<td>5</td>
<td>5.0</td>
<td>5.2</td>
<td>100.0</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Missing)</td>
<td>1</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Valid Cases 97  Missing Cases 3

Table 4.18 Clarity and Usefulness of Course Materials by Percent

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Excellent</td>
<td>55.8</td>
<td>42.2</td>
</tr>
<tr>
<td>Good</td>
<td>44.2</td>
<td>46.7</td>
</tr>
<tr>
<td>Fair</td>
<td>0.0</td>
<td>11.1</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Percent of Entire Sample 53.6  46.4

The p value resulting from the Chi-Square analysis was .035 indicating a significant difference between the two groups regarding their rating of course materials.

Additional questions on the reaction questionnaire indicated that 43% of the entire sample felt that the usefulness of the exercises was excellent and additional 52% felt they were good. Ninety-nine percent of the entire sample felt that the training met the objectives in a satisfactory manner. One hundred percent indicated they felt the
course examples were valuable, and 96% felt that the material presented was relevant to their jobs.

**Level of Course**

Table 4.19 shows that 87% of the entire sample thought that the level of the course was just right while about 6.5% felt it was too elementary and 6.5% felt it was too advanced.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too elementary</td>
<td>6</td>
<td>6.0</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Just right</td>
<td>81</td>
<td>81.0</td>
<td>87.1</td>
<td>93.5</td>
</tr>
<tr>
<td>Too advanced</td>
<td>6</td>
<td>6.0</td>
<td>6.5</td>
<td>100.0</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Missing)</td>
<td>5</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Valid Cases** 93  **Missing Cases** 7

**Expected Use of WordPerfect II**

Table 4.20 shows that while over a third of the sample felt that they expected to use WordPerfect more than 10 hours per week, 63% indicated that they would use it less than 10 hours per week. Three percent indicated that they did not think they would use WordPerfect at all.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>3</td>
<td>3.0</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Less than two hours</td>
<td>19</td>
<td>19.0</td>
<td>20.4</td>
<td>23.7</td>
</tr>
<tr>
<td>Two to five hours</td>
<td>26</td>
<td>26.0</td>
<td>28.0</td>
<td>51.6</td>
</tr>
<tr>
<td>Five to ten hours</td>
<td>11</td>
<td>11.0</td>
<td>11.8</td>
<td>63.4</td>
</tr>
<tr>
<td>More than ten hours</td>
<td>34</td>
<td>34.0</td>
<td>36.6</td>
<td>100.0</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Missing)</td>
<td>5</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Valid Cases** 93  **Missing Cases** 7
Reaction Sheet for Session One - Summary

The \( p \) value as illustrated in Question One in Table 4.21 was .0004 indicating a highly significant difference regarding overall reaction to the training. The \( p \) value for the second question was .035 indicating a significant difference between the two groups in their rating of the clarity and usefulness of course materials. The remainder of the questions on the first reaction sheet did not show significant differences in responses between the two groups.

Table 4.21 Reaction to Session One - Chi-Square Results

<table>
<thead>
<tr>
<th>Item</th>
<th>D.F.</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall rating</td>
<td>2</td>
<td>.0004 **</td>
</tr>
<tr>
<td>2. Clarity and usefulness of materials</td>
<td>2</td>
<td>.0350 *</td>
</tr>
<tr>
<td>3. Usefulness of exercises</td>
<td>2</td>
<td>.3752</td>
</tr>
<tr>
<td>4. Were course objectives presented</td>
<td>1</td>
<td>.9104</td>
</tr>
<tr>
<td>5. Were course objectives met</td>
<td>1</td>
<td>.9420</td>
</tr>
<tr>
<td>6. Were course examples valuable</td>
<td>7</td>
<td>.7197</td>
</tr>
<tr>
<td>7. Was material relevant to job</td>
<td>1</td>
<td>.7471</td>
</tr>
<tr>
<td>8. Level of course</td>
<td>2</td>
<td>.7239</td>
</tr>
<tr>
<td>9. Expect to use WordPerfect</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

** High Significance where \( p < .01 \)  
* Significance where \( p < .05 \)

The results indicate a significant difference in reaction to the training between the two groups: the instructor-led group rated the training higher overall and in the clarity and usefulness of material than the interactive video group.

Session Two Survey

Eighty-six percent of the original sample returned for the second training session. When individuals returned for the second training session they were asked to complete a survey (Appendix E). The purpose of the survey was to collect data on current use and expected use of WordPerfect, learning preferences, and to ask several questions about WordPerfect operations in order to test retention from the first training session.
Current Use

Of the individuals that returned for the second session, 57% indicated that they were not currently using WordPerfect (Table 4.22). Interviews with training coordinators indicated that the lack of use was generally applicable to the fact that the software had not yet arrived for a substantial number of the participants and was therefore not yet installed on their PC's.

Table 4.22 Current Use of WordPerfect - Entire Sample

<table>
<thead>
<tr>
<th>Current Use</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>49</td>
<td>50.0</td>
<td>57.0</td>
<td>57.0</td>
</tr>
<tr>
<td>Very little</td>
<td>14</td>
<td>14.3</td>
<td>16.3</td>
<td>73.3</td>
</tr>
<tr>
<td>Some</td>
<td>11</td>
<td>11.2</td>
<td>12.8</td>
<td>86.0</td>
</tr>
<tr>
<td>Frequently</td>
<td>8</td>
<td>8.2</td>
<td>9.3</td>
<td>95.3</td>
</tr>
<tr>
<td>Extensively</td>
<td>4</td>
<td>12.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Missing)</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 86

The p statistic was .0360 indicating a significant difference in current use between the groups. Table 4.23 shows that a higher percentage of the video group were not currently using WordPerfect and in the remaining categories of use the instructor-led group had higher percentages of use.

Table 4.23 Current Use of WordPerfect by Group

<table>
<thead>
<tr>
<th>Current Use</th>
<th>Instructor-Led Group Percent</th>
<th>Interactive Video Group Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>50.0</td>
<td>65.0</td>
</tr>
<tr>
<td>Very little</td>
<td>19.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Some</td>
<td>15.2</td>
<td>10.0</td>
</tr>
<tr>
<td>Frequently</td>
<td>15.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Extensively</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>Column Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 12
Expected Use of WordPerfect III

The question on expected future use of WordPerfect was asked a third time in the Session Two Survey. Table 4.24 indicates that contrary to the results on current use only two percent expected to not use WordPerfect at all. Over 90% indicated that they expected to use WordPerfect "some," "frequently," or "extensively."

<table>
<thead>
<tr>
<th>Expected Use</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>2</td>
<td>2.0</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Very little</td>
<td>6</td>
<td>6.1</td>
<td>7.1</td>
<td>9.5</td>
</tr>
<tr>
<td>Some</td>
<td>25</td>
<td>25.5</td>
<td>29.8</td>
<td>39.3</td>
</tr>
<tr>
<td>Frequently</td>
<td>31</td>
<td>31.6</td>
<td>36.9</td>
<td>76.2</td>
</tr>
<tr>
<td>Extensively</td>
<td>20</td>
<td>20.4</td>
<td>23.8</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>14</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Valid Cases</strong></td>
<td><strong>84</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When expected use is compared by group significant differences are found. The \( p \) statistic here was .0401(Chi Square = 10.02, df = 4). Unfortunately, no pattern is apparent in view of the higher percentage of video students indicating some or extensive expected use and higher percentage of instructor-led students indicating frequent expected use.

<table>
<thead>
<tr>
<th>Expected Use</th>
<th>Instructor-Led Group Percent</th>
<th>Interactive Video Group Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>4.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Very little</td>
<td>6.5</td>
<td>7.9</td>
</tr>
<tr>
<td>Some</td>
<td>28.4</td>
<td>31.6</td>
</tr>
<tr>
<td>Frequently</td>
<td>47.8</td>
<td>23.7</td>
</tr>
<tr>
<td>Extensively</td>
<td>13.0</td>
<td>36.8</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td><strong>Number of Missing Observations</strong></td>
<td><strong>14</strong></td>
<td></td>
</tr>
</tbody>
</table>
Learning Preference I

Two questions were asked on the Session Two Survey regarding learning preferences. The first question asked whether the student preferred to learn alone or as part of a group. About 60% indicated that their preference was to learn as part of a group. Table 4.26 below shows this distribution.

Table 4.26 Learning Preference I - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>On my own</td>
<td>32</td>
<td>32.7</td>
<td>39.5</td>
<td>39.5</td>
</tr>
<tr>
<td>In a Group</td>
<td>49</td>
<td>50.0</td>
<td>60.5</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>17</td>
<td>17.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td><strong>Valid Cases</strong></td>
<td><strong>81</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When results of this question are looked at by group, as in Table 4.27, it is apparent that the individuals generally prefer the type of training to which they were randomly assigned, although the preferential direction is stronger in the instructor-led group with 72.7% of the instructor-led group preferring to learn in a group while 54.1% of the video group preferred learning on their own. The results indicate a difference between the instructor-led and video groups on learning preference (Chi Square = 4.96, df = 1, p = .0259).

Table 4.27 Learning Preference I - Comparison by Group

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>On my own</td>
<td>27.3</td>
<td>54.1</td>
</tr>
<tr>
<td>In a group</td>
<td>72.7</td>
<td>45.9</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 17

Learning Preference II

Learning preference was asked again with more choices oriented toward self-directed instruction. As in the first question on learning preference, there was a majority
of the sample indicating a preference for classroom/instructor led training (Table 4.28). The percentage increased from 60.5 to 62.8 regarding group/classroom instruction preference although the choices available for self-direction were expanded to include audio/visual; books, manuals, and literature; as well as self-directed exploration.

Table 4.28 Learning Preference II - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom/Instructor</td>
<td>49</td>
<td>50.0</td>
<td>62.8</td>
<td>62.8</td>
</tr>
<tr>
<td>Audio Visual</td>
<td>17</td>
<td>17.3</td>
<td>21.8</td>
<td>84.6</td>
</tr>
<tr>
<td>From books, manuals and literature</td>
<td>11</td>
<td>11.2</td>
<td>14.1</td>
<td>98.7</td>
</tr>
<tr>
<td>Explore on my own (Missing)</td>
<td>1</td>
<td>1.0</td>
<td>1.3</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 78

Crosstabulation by group of the results of this question demonstrated a preference for the learning method of the group to which each individual in the sample was randomly assigned. Table 4.29 shows the preference percentage by group. The \( p \) statistic resulting from Chi-Square analysis was .0002 indicating a highly significant difference between the preferred learning style of the two groups (Chi Square = 20.07, df = 3, \( p = .0002 \)).

Table 4.29 Learning Preference II - Comparison by Group

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a classroom with an instructor</td>
<td>80.5</td>
<td>43.2</td>
</tr>
<tr>
<td>In an audio/visual setting</td>
<td>2.4</td>
<td>43.2</td>
</tr>
<tr>
<td>From books, manuals and literature</td>
<td>14.6</td>
<td>13.6</td>
</tr>
<tr>
<td>By exploring the product</td>
<td>2.4</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Number of Missing Observations = 20
Knowledge Test

The Second Session Survey included several questions regarding WordPerfect functions. There were no significant differences except for one question which asked respondents to indicate how to implement a WordPerfect feature called "pull-down menus." A significant difference was indicated as a result of the Chi-Square analysis on this question (Chi Square = 3.98, df = 1, \( p = .046 \)). Questions Four and Six were tossed out because students had interpretation problems with the questions.

Table 4.30 Knowledge Test - Chi-Square Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Chi-Square</th>
<th>D.F.</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How to start WordPerfect</td>
<td>.00</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>2. What is wordwrap</td>
<td>.00</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>3. How to use Reveal Codes</td>
<td>.013</td>
<td>1</td>
<td>.90</td>
</tr>
<tr>
<td>4. What is right justified</td>
<td>Not Available</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>5. How to access pull-down menus</td>
<td>3.98</td>
<td>1</td>
<td>.05 *</td>
</tr>
<tr>
<td>6. How to use the mouse</td>
<td>Not Available</td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

*Significance where \( p < .05 \)

Table 4.31 below shows that in the entire sample 66.3% answered the question on pull-down menus correctly.

Table 4.31 Access Pull-down Menus - Entire Sample

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect</td>
<td>33</td>
<td>33.7</td>
<td>33.7</td>
</tr>
<tr>
<td>Correct</td>
<td>65</td>
<td>66.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Valid Cases 98

However, while 77.8% of the video group answered this question correctly, only 56.6% of the instructor-led group marked a correct answer (Table 4.32) (Chi Square = 3.98, df = 1, \( p = .046 \)). In the instructor interview at the conclusion of the training an inquiry was made regarding the topic of pull-down menus. The instructor indicated that she did cover it during the training although she did not follow the course material precisely in this instance, preferring instead to allow students the opportunity to explore the menus in
a non-directed manner. Although her indicated assumption was that an exploratory teaching style for this topic would increase effectiveness, the data seem to indicate otherwise.

Table 4.32 Knowledge Test - Accessing Pull-down Menus

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Incorrect</td>
<td>43.4</td>
<td>22.2</td>
</tr>
<tr>
<td>Correct</td>
<td>56.6</td>
<td>77.8</td>
</tr>
<tr>
<td>Column Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 0

It seems reasonable to conclude that the significance on the question regarding pull-down menus was probably a result of the choice the instructor made regarding teaching approach for this topic. Table 4.33 shows the results of a t-test on the knowledge questions on the Second Session Survey. In this analysis $t = .617$ indicating a lack of significance when the questions on knowledge are consolidated. The conclusion reached regarding knowledge of WordPerfect was that there was no significant difference between the two groups.

Table 4.33 t-test for Overall Knowledge

<table>
<thead>
<tr>
<th></th>
<th>Number of Cases</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor-led Group</td>
<td>53</td>
<td>76.98</td>
<td>33.37</td>
<td>4.58</td>
</tr>
<tr>
<td>Interactive Video Group</td>
<td>45</td>
<td>81.78</td>
<td>30.99</td>
<td>4.62</td>
</tr>
</tbody>
</table>

F Value = 1.16 2-Tail Prob. = .617  
*Significance where $t < .05$

Performance Test Two

Individuals returning for the second training session were asked to complete a performance test similar to the one they completed at the conclusion of Session One (Appendix D). The purpose was to gather data prior to additional training about changes in skill level. Table 4.34 illustrates that the similarity of mean scores (1.74 and 1.77)
between the instructor-led and video group indicates about the same ability to complete the work sample.

Table 4.34 t-test for Overall Performance

<table>
<thead>
<tr>
<th>Number of Cases</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor-led Group</td>
<td>45</td>
<td>1.7422</td>
<td>.58</td>
</tr>
<tr>
<td>Interactive Video Group</td>
<td>39</td>
<td>1.7077</td>
<td>.62</td>
</tr>
</tbody>
</table>

F Value = 1.15
2-Tail Prob. = .658
*Significance where t < .05

Table 4.35 illustrates that there were no elements of the Performance Test 2 where significant differences occurred.

Table 4.35 Performance Test II - Chi Square Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Chi-Square</th>
<th>D.F.</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start WordPerfect</td>
<td>.80</td>
<td>3</td>
<td>.84</td>
</tr>
<tr>
<td>2. Character formatting - bold and underline</td>
<td>4.01</td>
<td>3</td>
<td>.26</td>
</tr>
<tr>
<td>3. Type the text</td>
<td>2.02</td>
<td>3</td>
<td>.56</td>
</tr>
<tr>
<td>4. Save the document</td>
<td>1.94</td>
<td>3</td>
<td>.58</td>
</tr>
<tr>
<td>5. Use View Document</td>
<td>1.54</td>
<td>3</td>
<td>.67</td>
</tr>
</tbody>
</table>

*Significance where p < .05

Reaction to Second Session

The reaction sheet was administered a second time at the end of the second training session (Appendix B). Although no hypotheses were proposed related to this instrument, it does yield additional insight into subjective reaction of the individuals in the sample.

Overall Rating of Training of Second Session

After the first training session about 61% of the entire sample rated the training as excellent. This increased to 65% after the second training session.
Table 4.36 Overall Rating of Training by Group - Second Session - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>55</td>
<td>56.1</td>
<td>64.7</td>
<td>64.7</td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>21.4</td>
<td>24.7</td>
<td>89.4</td>
</tr>
<tr>
<td>Fair</td>
<td>8</td>
<td>8.2</td>
<td>9.4</td>
<td>98.8</td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
<td>1.0</td>
<td>1.2</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>13</td>
<td>13.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 85

As in the first training session, the two groups differed significantly in their overall reaction to the training (Chi Square = 12.88, df = 3, p = .0049). Table 4.37 below shows crosstabulated results for overall rating of training after Session Two. While 77.8% of the instructor led group rated the second session training as excellent, only 50% of the video group choose excellent as the overall rating.

Table 4.37 Overall Rating - Second Session by Group

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Excellent</td>
<td>77.8</td>
<td>50.0</td>
</tr>
<tr>
<td>Good</td>
<td>22.2</td>
<td>27.5</td>
</tr>
<tr>
<td>Fair</td>
<td>0.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Number of Missing Observations = 13

Clarity and Usefulness of Course Materials

Sixty-two percent of the entire sample rated the course materials as excellent. Table 4.39 shows that while the video group rated the course materials somewhat lower, the Chi-Square analysis produced a p value of .0833 (Chi Square = 4.79, df = 2) indicating no significant differences between the two groups. This is a change from the first reaction sheet where there were significant differences between the two groups on this question.
Table 4.38 Clarity and Usefulness of Course Materials - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>52</td>
<td>53.1</td>
<td>61.9</td>
<td>61.9</td>
</tr>
<tr>
<td>Good</td>
<td>28</td>
<td>28.6</td>
<td>33.3</td>
<td>95.2</td>
</tr>
<tr>
<td>Fair</td>
<td>4</td>
<td>4.1</td>
<td>4.8</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>14</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Valid Cases 84

Table 4.39 Clarity and Usefulness of Course Materials by Group

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Excellent</td>
<td>66.7</td>
<td>56.4</td>
</tr>
<tr>
<td>Good</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Fair</td>
<td>0.0</td>
<td>10.3</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Column Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 14

Usefulness of Exercises

Table 4.40 shows that while both groups rated the training as excellent in roughly equal percentages, the balance of the video group rated the training lower than the instructor led group.

Table 4.40 Usefulness of Exercises

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Excellent</td>
<td>48.9</td>
<td>47.5</td>
</tr>
<tr>
<td>Good</td>
<td>51.1</td>
<td>35.0</td>
</tr>
<tr>
<td>Fair</td>
<td>0.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Column Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number of Missing Observations = 13

Level of Course - Session Two

Table 4.41 shows that nearly 98% of the instructor-led group rated the level of the course as "just right" while only 79% of the video group choose this rating. The table
indicates that about one fifth of the video group rated the training as "too advanced."

This resulted in a significant difference (Chi Square = 5.73, df = 1, p = .02).

Table 4.41 Level of Course - Session Two by Group

<table>
<thead>
<tr>
<th></th>
<th>Instructor-Led Group</th>
<th>Interactive Video Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Too elementary</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Just right</td>
<td>97.8</td>
<td>78.9</td>
</tr>
<tr>
<td>Too Advanced</td>
<td>2.2</td>
<td>21.1</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td><strong>Number of Missing Observations</strong></td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Expected Use of WordPerfect IV

The amount of expected use of WordPerfect was asked again at the conclusion of the second training session. No significant differences (Chi Square = 1.66, df = 3, p = .065) were found between the two groups although over 50% of the entire sample indicated they expected to use WordPerfect five or more hours per week.

Table 4.42 Expected Use of WordPerfect IV - Entire Sample

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 hours</td>
<td>19</td>
<td>19.4</td>
<td>24.1</td>
<td>24.1</td>
</tr>
<tr>
<td>2 - 5 hours</td>
<td>15</td>
<td>15.3</td>
<td>19.0</td>
<td>43.0</td>
</tr>
<tr>
<td>5 - 10 hours</td>
<td>17</td>
<td>17.3</td>
<td>21.5</td>
<td>64.6</td>
</tr>
<tr>
<td>10 + hours</td>
<td>28</td>
<td>28.6</td>
<td>35.4</td>
<td>100.0</td>
</tr>
<tr>
<td>(Missing)</td>
<td>19</td>
<td>19.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Valid Cases 79

Reaction to Session Two - Summary

Responses on the second reaction sheet indicated a significant difference between the instructor-led and the video groups on their overall rating of the training (Chi Square = 12.89, df = 3, p = .005). The instructor-led group rated the training better than the video group. Although there was a significant difference after the first training session between the two groups on the question regarding clarity and usefulness of course
materials, there was not a significant difference on this question after the second session (Chi Square = 4.97, df = 2, p = .08). The reverse was true on the question regarding usefulness of exercises with no significance after the first training session and a significant difference found between the two groups after Session Two. Table 4.43 below shows the consolidated results of the second reaction sheet.

<table>
<thead>
<tr>
<th>Item</th>
<th>Chi-Square</th>
<th>D.F.</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall rating</td>
<td>12.88</td>
<td>3</td>
<td>.005 **</td>
</tr>
<tr>
<td>2. Clarity and usefulness of materials</td>
<td>4.97</td>
<td>2</td>
<td>.08</td>
</tr>
<tr>
<td>3. Usefulness of exercises</td>
<td>9.15</td>
<td>3</td>
<td>.028 *</td>
</tr>
<tr>
<td>4. Were course objectives presented</td>
<td>.028</td>
<td>1</td>
<td>.87</td>
</tr>
<tr>
<td>5. Were course objectives met</td>
<td>1.60</td>
<td>1</td>
<td>.21</td>
</tr>
<tr>
<td>6. Were course examples valuable</td>
<td>.64</td>
<td>1</td>
<td>.42</td>
</tr>
<tr>
<td>7. Was material relevant to job</td>
<td>.46</td>
<td>1</td>
<td>.50</td>
</tr>
<tr>
<td>8. Level of course</td>
<td>5.73</td>
<td>3</td>
<td>.02 *</td>
</tr>
<tr>
<td>9. Expect to use WordPerfect</td>
<td>1.66</td>
<td>3</td>
<td>.65</td>
</tr>
</tbody>
</table>

** High Significance where p < .01  
* Significance where p < .05

Performance Test Comparisons

Table 4.44 below shows mean scores for both groups. The instructions for scoring both Performance Tests were to assign a numeral 1 through 4 as indicated below for each aspect of the test.

(1) Completed Easily;
(2) Completed;
(3) Struggled Somewhat;
(4) Asked for assistance.

<table>
<thead>
<tr>
<th>Table 4.44 Performance Test Comparisons - Group Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor-led group</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Interactive video group</td>
</tr>
</tbody>
</table>
Performance Test Comparisons by Age

One way analysis of variance was performed to compare performance test scores with age group categories. Table 4.45 shows that except for the 25 or under age group performance was rated poorer in the second test.

Table 4.45  Mean Performance Test Scores by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Performance Test One</th>
<th>Performance Test Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or under</td>
<td>1.1000</td>
<td>1.0800</td>
</tr>
<tr>
<td>26 to 35</td>
<td>1.2857</td>
<td>1.5652</td>
</tr>
<tr>
<td>36 to 45</td>
<td>1.6464</td>
<td>1.9375</td>
</tr>
<tr>
<td>46 to 55</td>
<td>1.6273</td>
<td>1.7538</td>
</tr>
<tr>
<td>56 to 65</td>
<td>1.7400</td>
<td>1.8000</td>
</tr>
</tbody>
</table>

Differences were found between age groups for Performance Test One ($F = .02$, $df = 4$) and Performance Test Two ($F = .04$, $df = 4$). The Newman-Keuls procedure indicated that the significant difference in performance was between age groups one and three. Although the pattern, depicted in Table 4.45 does not provide insight into why there is significance, and only between groups one and three of the second test, the trend is evident in both tests that the scores generally get higher (performance decreases) as age increases.

Hypotheses

The following null hypotheses were tested for significance at the .05 level:

Hypothesis 1

Restatement
There is no significant difference in reaction to the training between the interactive video trained group and the instructor-led group.

Decision: Rejected

Discussion
There is a significant difference in reaction between the instructor-led and the video groups. Of the 10 items on the reaction sheet which was
completed by students at the end of the first training session, responses to
the first question on overall reaction indicated a significant difference \((p = .0004)\) between the instructor-led and video groups. Tables 4.15 and 4.16 show the distribution of rankings for the entire sample and for each group on this question. The percentage of the instructor group that ranked the training as excellent was 78.8 and the percentage of the video group ranking the training as excellent was 40.0. Responses to the second question indicated a significant difference between the two groups \((p = .035)\) (Table 4.21).

**Hypothesis 2**

**Restatement**

There is no significant difference in performance between the interactive video trained group and the instructor-led group.

**Decision:** Accepted.

**Discussion**

There is no significant difference between the instructor-led and video groups in ability to complete a work sample test. Table 4.14 shows that most of the individuals completed easily or completed the ten components of Performance Test One.

**Hypothesis 3**

**Restatement**

There is no significant difference in post-training use between the interactive video trained group and the instructor-led group.

**Decision:** Rejected.
Discussion

The p statistic of the completed Chi-Square was .0360 (Tables 4.22 and 4.23) on the question regarding current use indicating a significant difference in current use. The instructor-led group were using WordPerfect more after two to three weeks than the interactive video group. Over half of each group reported not using WordPerfect at all and it should be kept in mind that, although participating agencies thought WordPerfect would be installed throughout their organizations by the beginning of the Session One, this was not the case and the high percentage of current non-users was probably the result of the software being unavailable. The expected use questions, especially the third time asked (at the same time as the current use question) also indicated a significant difference in expected use although the direction of the data does not favor either group (Table 4.25).

Hypothesis 4

Restatement

There is no significant difference in performance after two to three weeks between the interactive video trained group and the instructor-led group.

Decision: Accepted.

Discussion

Mean scores on the second performance test were 1.74 for the instructor-led group and 1.70 for the interactive video group indicating a similarity in perceived difficulty of the test by the two groups (Table 4.34). There were no significant differences found between the two groups in their indicated performance of the second test. Table 4.45 shows these results.
V. OVERVIEW, DISCUSSION, AND IMPLICATIONS

This chapter presents: (a) an overview of the research project including its purpose, methodology and results; (b) the conclusions reached as a result of the study; (c) a discussion of the relationship of the major issues surrounding the need for this research, the approach used, and the results of this study; (d) the implications of the results for practitioners; and (e) recommendations for further research.

Overview

This research compared and contrasted the effectiveness of an interactive video training program with an instructor-led program for teaching working adults the personal computer application WordPerfect. The purpose of this study was to determine whether instructor-led training of WordPerfect resulted in significantly different reaction, performance and post-training use than interactive video instruction. The major objectives of the study were to (a) develop a research methodology and instrumentation for the study; (b) determine whether instructor-led training resulted in significantly different reaction, performance, and post-training use than interactive video instruction; and (c) utilize the findings to suggest strategies for training working adults personal computer applications.

Need for the Research

The research was based on the need: (a) to comparatively evaluate various instructional approaches for teaching PC applications because there is little known about effectiveness in this area; (b) for easily administered, yet comprehensive evaluation methodologies in computer training; and (c) to build on the limited amount of educational research with working adults. This research is important because
technological delivery of instruction is a rapidly developing and important component of adult education and training. The intention of this research was to expand the base of knowledge trainers and instructional designers use to teach personal computer applications.

**Background**

Personal computers are at the heart of the office automation revolution. Development of the skills to use PC's is a key to their effective implementation. How to go about the task of training the hundreds of millions of PC users how to use their word processors, spreadsheets and other applications is an important concern of managers in business and government as well as the developers of the technology. The effort to move to graphical user interface (GUI), "Windows" for the PC for example, is, in essence, an effort to shorten the learning curve.

Skills to use the technology are being integrated into the curriculum of elementary and secondary schools and we can expect entry level workers to already have basic skills related to the PC in future years. There is a need at the present, however, to address the question of how to most effectively provide training to working adults who find themselves needing to either learn basic PC skills or to expand their current knowledge and skills in order to remain competitive in the job market. Thus, we need answers to the following questions:

1. How do we allocate dollars allocated to PC training?
2. Are technological methods of delivering instruction more effective than traditional instructional methods?
3. How do we measure effectiveness of training?

Without a knowledge base we cannot answer the first question except through speculation. Answering the second question does begin to provide a basis for addressing the first question on allocation but the second question cannot be addressed without answering the third question on measuring effectiveness. A beginning premise of this
research, therefore, was that an evaluation methodology that addressed the issues of PC training was necessary as the first step before comparisons of delivery systems could be made.

**Evaluation of Instructional Methods**

Effectiveness, for the purposes of this research, was defined as whether or not the training: (1) had a favorable reaction from participants; (2) provided a basis for the sought after learning (as measured by a performance test); and (3) produced expected behavioral changes in participants (increased amount of use). The methodology developed needed to be suitable for a professional context where evaluation activities often take a back seat to more pressing priorities.

Reaction was determined by surveying the attitudes, opinions, feelings and other responses immediately after the completion of training and was obtained through the use of a short questionnaire. Post-training use was measured in this study by the number of hours per week the subject used the product and was obtained through the use of a survey when subjects returned for follow-up training. Performance was obtained through the administration of a performance test on a simulated job task.

Evaluations of two groups of working adults were administered after completion of the instructor-led and the interactive video programs. Subjects were trained by either an instructor in a classroom or through the use of an interactive video program. Instructional objectives, content and topic sequence of the training were the same for both groups. A pilot study was conducted to confirm the reliability and validity of the instruments and methodology.

**Treatment**

The instructor-led training was conducted in groups of eight to ten students and the interactive video training was self-paced and conducted individually. Fifty-three individuals were in the instructor-led group and forty-seven in the interactive video
training group. Individuals completed a demographic questionnaire at the beginning of the first training session.

At the end of the first training session a performance test and a reaction questionnaire were completed by members of both groups. Individuals in the sample returned for a second session two to three weeks after completion of the initial training. At the beginning of the second training session students in both groups completed a survey, a knowledge test, and a performance test. A reaction questionnaire was given at the conclusion of the second training session.

**Analysis and Results**

Results were coded and tabulated and descriptive and analytic statistics were prepared for the dependent variables (reaction, performance, and post-training use) and covariates (age, gender, occupation, organization, education, and prior use). The critical interval was .05.

The null hypotheses were:

**Hypothesis 1:** There is no significant difference in reaction to the training between the interactive video trained group and the instructor-led group.

**Hypothesis 2:** There is no significant difference in end of training performance between the interactive video trained group and the instructor-led group.

**Hypothesis 3:** There is no significant difference in post-training use between the interactive video trained group and the instructor-led group.

**Hypothesis 4:** There is no significant difference in performance after two to three weeks between the interactive video trained group and the instructor-led group.

Results indicated that there were no significant differences between the instructor-led and interactive video groups regarding demographic variables. The groups were comparable. Results also indicated that there were no significant differences in performance between the instructor-led group and the interactive video group after either the first training session or after a two to three week period. The instructional methods
were similar (statistically) in effectiveness. Results indicated highly significant differences \((p = .0004)\) in the reaction of the two groups with the instructor-led group rating the training better than the video group. Ratings of the instructor-led group were also significantly better \((p = .035)\) than the video group on the clarity and usefulness of the course materials at the end of Session One. A significant difference \((p = .036)\) was also indicated regarding post-training use of WordPerfect. Results also indicated that the instructor-led group used WordPerfect more after two to three weeks than the interactive video group although there was a high percentage of individuals that indicated no current use because the software was not yet installed on their PC's. Null Hypotheses 2 and 4 (performance) were accepted and Hypotheses 1 (reaction) and 3 (post-training use) were rejected.

**Conclusions**

What are the conclusions as a result of this study? First, well designed and delivered interactive video instruction appears to be as effective as instructor-led training as a method of delivering personal computer training to adults. The study results indicate that training method does not result in differences in the skills and knowledge mastered and ability to complete a performance test.

Second, there is a significant preference by the adults in this study's sample for instructor-led training. Instructor-led students rated the training higher overall than interactive video students. Also, although a majority of each group indicated a learning preference for the method of the group to which they were assigned, there was a substantial number of IVI students that indicated classroom/instructor-led training as their preference.

Third, methodologies used to evaluate PC training need to be expanded beyond end-of-training reaction sheets. In addition, there is a need to incorporate both subjective and objective measures. Although objective measures of performance and knowledge
appear to indicate no difference in training effectiveness, the subjective measures (reaction) indicated a significant perceived difference. Individuals in the instructor-led group rated the training better. Without comprehensive evaluation the full picture of training effectiveness in not discovered.

In addition, although about half of the sample apparently did not have WordPerfect installed on their PC's by the end of the training and subsequently indicated no current use, those that did indicate current use demonstrated that the instructor-led group used WordPerfect more than the interactive video group two to three weeks after the training. Results of this study do not reveal whether the differences in use are a result of training methodology or of some other unknown factors. Results do indicate that there were no significant differences on the performance tests at the end of the training or after two to three weeks. It seems reasonable to conclude, then, that differences in use were not a result of differences in the effectiveness of the training methods to teach performance skills.

These conclusions were reached as a result of examining the literature on PC training and by conducting a comparative evaluation of the two instructional methods. Examination of the literature and prior research suggests that there is a general lack of knowledge regarding the effectiveness of PC training and the methods used to deliver it. There is also increasing emphasis on using technology to deliver training. Additionally, commonly accepted methodologies that comprehensively examine various PC training approaches were not found in the literature review.

Discussion and Implications for Practice

The evaluation methodology that was developed for this study examined participant reaction, performance, and post-training use. The instruments were easily administered and generated both subjective (reaction) and objective (performance and
use) measures. The instruments were improved as a result of the pilot study and could be improved again as a result of the study itself.

Suggestions for Improving the Study

One area of improvement would be to expand the investigation of preferred learning style. Two questions were asked regarding preferred learning style at the conclusion of the training (See Appendix E, Questions 3 and 4). Although this yielded an interesting effect -- students indicated a preference for the method to which they were assigned -- determining preferences prior to random assignment would yield additional insight. Also, non-random assignment, or assigning individuals to instructional groups of their selected preference and then comparing results of groups would be insightful.

Another area where the study could be improved is in the difficulty of the performance and knowledge tests. Performance tests were completed, on average, quite easily. Slightly more difficult tests might broaden the results and yield additional information such as whether the instruments in this study created a ceiling effect. The possibility exists, however, that more difficult tests would result in greater apprehension about participation in the study. Further empirical investigation into the questions of skill and knowledge retention are needed.

Post-Training Use

Results related to post-training use are interesting. Although 57 percent of the entire sample (Table 4.22) indicated no current use, the balance of the sample indicated that the instructor-led group used WordPerfect more after the training than the interactive video group. However, when expected use is examined, the significance of the results related to current use are neither clarified nor strongly supported. Significant differences between the groups were found regarding the expected use of WordPerfect but there was no apparent pattern favoring one group more than the other (Table 4.25). Therefore, although Null Hypothesis 3 was rejected because a significant statistical difference was
found, there is a clear need for additional study before linking differences in post-training use with training method.

Understanding the Sample

Is the sample representative of working adults? The answer is not known but it is clear that the individuals in the sample were employed and were not full-time students. Of the original sample of 111, the number of dropouts was 11 which does not seem unreasonable for busy working professionals. What is curious is that of the 11 that dropped out, eight were men. Although percentages can be deceiving with small numbers, 47 percent of the original men dropped out of the study before training began. This factor, along with the predominance of women in PC training in practice, suggests the need for additional examination.

Factors Related to Age

Another area of interest is related to age. Although significant differences were not apparent between the groups regarding age and mean performance test scores, (Table 4.45) scores did increase generally (performance decreased) as age increased. Two factors might contribute to this trend. First, since the performance test was a self-assessment of difficulty, there could be an age-related tendency to give less optimistic or more realistic ratings of one's ability as an individual gets older. Second, there could be an actual difference in ability related to age. No implications are implied, however, on why the latter might be the case.

Fear As a Training Issue

Fear surfaced in the literature as a PC related training issue. Although there were no instruments or measures in this study related to the fear issue, one member of the sample indicated in an interview that he had postponed PC training for several years because of anxiety regarding training. Interestingly, his fear was of the classroom, tests, performance pressures in general and not apprehension solely related to computers. This
creates a curious paradox; is there both a preference for classroom/instructor-led training and a fear of the classroom environment among adults?

Summary Discussion

The purpose of this study was to determine whether instructor-led training of WordPerfect to working adults was more effective than interactive video instruction. Effectiveness was determined by comparing reactions, performance and post-training use. The results of the study indicated that there were no differences in performance as a result of training approach. Individuals in both the instructor-led and video groups completed the simulated job task (typing a letter) on average, quite easily. There was also no difference in performance after two to three weeks when the subjects returned for the second training session. However, the results indicated that the instructor-led group rated the overall value of the training higher.

What does this mean in practice? Can a supervisor or training coordinator in a state agency build a library of interactive video tapes for use in training people in the organization how to use personal computer technology and know that the results of such training will be effective? The results of this study suggest that there is no difference in ability to perform as a result of training approach assuming high quality instructional design and training delivery. However the research also suggests that there is a strong preference for classroom/instructor-led training.

One might conclude then, that if a supervisor or training director has a choice, classroom training would be preferred because the attitudes and opinions that constitute the subjective reactions reflected in the results of this study are probably as important in determining training outcome as the more objective measures of knowledge and performance. However, the reality of adult education is that there is a paramount need for alternatives to the traditional classroom with a teacher approach. Technology such as interactive video allows for a leveraged investment of training dollars.
Many people can be trained over a long period of time with interactive video technology. In addition, IVI allows training to be delivered at times and in remote locations where it would be impossible to have a classroom full of personal computers and an instructor. It can also be reviewed at a later time. It can be checked out by an employee and taken home. It will continue to be a source of training for months or years after it is acquired. The problem, therefore, is one of integrating the benefits of interactive video and programmed instruction into the preference of adults to stay with the traditional approach of a classroom and an instructor.

Interactive video also offers the advantages of a constant quality level and predictable costs. What is missing is the leadership, problem-solving, motivational direction, and varying roles (e.g., expert, facilitator, formal authority, socializing agent) of an instructor. Also missing are the encouragement, assistance, competition and other factors related to membership in the classroom group.

What is needed is a training strategy where an instructor can be free of repetitive delivery and concentrate instead on the characteristics of professional adult education and training that have an impact on training results: factors such as the unique background, needs, and goals of each learner; the prior experience level of each student; the fear, curiosity, and motivation of each individual; and the pace at which each adult works and learns. A classroom filled with adult learners implies the need for the presence of someone with greater ability than a lab technician skilled primarily in the use of video tapedecks, PC's and related technology. It also implies the need for more than a PC "guru." Technical expertise is not enough. An experienced, skilled and knowledgeable adult educator is needed.

Practitioners of PC training should be willing to stretch their effectiveness through implementation of integrated approaches. There is too much to learn, too many courses to develop, and too many people to teach to continue to believe that they can stay with traditional instructor-led programs solely. Instructional designers need to integrate
the benefits of both technological instruction and instructor-led training in their work from the writing of a unique skill building exercise to the development of an entire curriculum. Training directors, business managers and others who make buying decisions related to PC training need to respond to the demand for professional development with a willingness to increase the effectiveness of their investment in training by the intelligent application of technology as a instructional medium, but without abandoning what many adults value most in their learning experiences.

Recommendations for Further Research

Further research into the use of interactive video as a vehicle to deliver PC education and training to adults is warranted. The body of research on PC training can be extended by applying the framework of this study to other personal computer applications, including spreadsheets, data base management, and desktop publishing. In addition, there are other educational technological delivery systems that need examination. One of the most important is interactive video disk.

Video disk, which is a combination of interactive video instruction, computer assisted instruction and laser disk technologies, has a fraction of the installed user base compared to interactive video tape. It will be increasingly important in future years, however. The cost of IVI equipment and production is falling rapidly, making the technology more accessible for consumers and profitable for developers. Furthermore, the capability of the technology far exceeds interactive video tape.

Practitioners need additional research regarding PC training on other populations. The population specified in this research was working adults in general, but the sample was predominantly from government agencies. Is there a difference when the comparisons are made with individuals from private organizations or in small businesses? Also, would results change if individuals were directed to attend training instead of volunteering? Is self-selection a key aspect of motivation to learn? Is there a
difference when individuals in a classroom are predominantly from the same work environment? Does pre-existing group cohesion influence the classroom atmosphere in a positive or negative way?

There is a need to explore the relationship of gender to learning and applying PC technology. Why is the ratio of women to men so high in this area of training and does this relationship exist in actual use at the workplace? Does the "information age" mean that women will have the predominate capability to access and use personal computer technology?

Training directors need to know if "fear" of classrooms, testing, and other educational characteristics keep some working adults out of the PC classroom altogether even though a significant need for professional development related to the technology is apparent and necessary for productivity and career advancement. Also important are the results related to age. Frequent mention in the literature as well as results of this study suggest further exploration of the relationship between learning to use a PC and age is needed. Also, is fear of technology and fear of the classroom related to age and prior experience with technology? Would there be shifts in these factors as current younger generations mature?

Another important area needing additional study is the relationship of preferred learning style to PC training methods. Will preferred learning style shift from a classroom with an instructor to technology oriented, self-paced methods as younger generations become the adult learners of the future?

Most importantly, additional study comparing interactive video and instructor-led training over the long term would add to the results of this study. Is there a difference in performance or use after ninety days? Six months? Or after one year?
REFERENCES


APPENDICES
Appendix A
Demographic Questionnaire

Control Number_________________

Directions: Please fill in the information below and check the most appropriate answer to the questions.

Name: __________________________________________

Organization: ______________________________________

Address: __________________________________________

City: ____________ State: _____ Zip Code: _________

Home Phone: _______________ Work Phone: __________

1. The following best describes my company:
   ___ Government
   ___ Non-Profit Services
   ___ Utilities, Transportation, Communications
   ___ Professional Services
   ___ Education
   ___ Manufacturing
   ___ Legal
   ___ Finance, Insurance, Real Estate
   ___ Hospitality/Food Service
   ___ Retail Trade
   ___ Wholesale Trade
   ___ Other (Specify)________________________

2. The following best describes my position:
   ___ Secretarial/Admin Asst./Support Staff
   ___ Professional
   ___ Technical
   ___ Management
   ___ Sales/Marketing
   ___ Supervisor
   ___ Self-employed
   ___ Other (Specify)________________________

3. My company/organization employs:
   ___ 1-25 employees
   ___ 26-50 employees
   ___ 51-100 employees
   ___ 100+ employees
4. I am
   ___ Male
   ___ Female

5. My prior education in number of years is:
   ___ Under 12
   ___ High school graduate
   ___ Some college/trade school
   ___ Associate degree/trade school graduate
   ___ Four year degree
   ___ Other (Specify)_____________________

6. My prior use of a personal computer is:
   ___ None
   ___ Very little
   ___ Some
   ___ Extensive

7. I am acquainted with word processing:
   ___ Not at all
   ___ I know what it is
   ___ I have used it before
   ___ I can produce documents
   ___ I consider myself quite skilled
   ___ Other (Specify)_____________________

8. As a result of this training I expect to use WordPerfect?
   ___ Not at all
   ___ Less than 2 hours per week
   ___ 2 to 5 hours per week
   ___ 5 to 10 hours per week
   ___ More than 10 hours per week

9. I presently:
   ___ Do not have access to a personal computer
   ___ Own my own personal computer
   ___ Have a personal computer on my desk at work
   ___ I plan to purchase a personal computer soon
   ___ Other (Specify)_____________________

10. My position classification is:
    ___ Represented
    ___ Management Service
    ___ Other
11. My age category is:
   ___ 25 or under
   ___ 26 to 35
   ___ 36 to 45
   ___ 46 to 55
   ___ 56 to 65
   ___ Over 65
Appendix B

Workshop Evaluation

Control Number

Directions: Please mark the best response to the following questions:

1. What is your overall rating of this training?
   ( ) Excellent ( ) Good ( ) Fair ( ) Poor

2. How would your rate the clarity and usefulness of the course materials?
   ( ) Excellent ( ) Good ( ) Fair ( ) Poor

3. How were the exercises at clarifying and reinforcing the concepts/skills being taught?
   ( ) Excellent ( ) Good ( ) Fair ( ) Poor

4. Were the course objectives presented before the class began?
   ( ) Yes ( ) No

5. Did the course meet its objectives in a satisfactory manner?
   ( ) Yes ( ) No

6. Were the course examples valuable?
   ( ) Yes ( ) No

7. Was the material presented relevant to your job?
   ( ) Yes ( ) No

8. What was the level of the course?
   ( ) Too elementary ( ) Just right ( ) Too advanced

9. As a result of this training I expect to use WordPerfect?
   ( ) Not at all
   ( ) Less than 2 hours per week
   ( ) 2 to 5 hours per week
   ( ) 5 to 10 hours per week
   ( ) More than 10 hours per week

10. Which were the most personally interesting and beneficial subjects presented during this training?

11. What do you recommend be changed about the training?

12. Do you have any other comments about this training program?
Appendix C  
Performance Test

Directions: To help assist in the evaluation of the training you received please complete the following exercise. Do the best that you can at this time. Please rate your ability to complete each of these tasks according to the following scale:

1. Completed Easily
2. Completed
3. Struggled Somewhat
4. Asked for Assistance

Type the attached document by following the steps below:

1. Start WordPerfect. Enter and center your name, address and phone number. Make your name bold.

2. Enter today's date in the position indicated by using the tab key.

3. Enter the inside address and salutation:

4. Type the text of the letter. Use underlining, indents and other appropriate formatting where indicated.

5. Edit the inside address to read:

   Manager, Customer Service
   Tom Anderson Furniture
   4505 SE 82nd Ave.
   Portland, OR 97205


7. Exit the program.

8. Start the program and retrieve your document.

9. Print a copy of your document to the screen with "view".

10. Exit the program and turn off the PC.
Dear Sir:

The purpose of this letter is to let you know that the table and chairs I purchased at your company were delivered damaged. Hank, the delivery crew foreman, offered to repair the broken chairs on the spot.

To my amazement, what had appeared to be serious damage was only sloppy assembly. This probably happened at the factory and was not your company's responsibility. However, Hank had the necessary tools as well as an assortment of nuts, bolts and washers in his tool kit and had the problem fixed quickly.

It was refreshing to see an employee of a large company like yours take on the responsibility for resolving a problem instead of simply referring it on to someone else. Your customer service attitude and Hank in particular should be commended. Good customer service happens too infrequently.

Sincerely yours,

(Your name)
Appendix D

Work Sample Review

Name ____________________________  Control Number __________

Work Sample Review

Directions: To assist in the evaluation of this training please complete the following exercise. Do the best that you can at this time. Your realistic rating of your ability will assist us in developing better training materials. Please rate your ability to complete each of these tasks according to the following scale:

1. Completed Easily
2. Completed
3. Struggled Somewhat
4. Asked for Assistance

---

Type the attached document by following the steps below:

---

1. Start WordPerfect. Enter and center the word "Memorandum".
2. Make the word "Memorandum" bold and underlined.
3. Type in the text of the memorandum.
4. Save your document using the filename "Memo1".
5. Use View document to display your document.

---

Have your instructor or lab monitor initial here: ________

After you have completed this exercise clear your screen and prepare for Intermediate WordPerfect.
Memorandum

Date: March 22, 1991

To: All Staff

From: Personnel Department

RE: Summer Vacation

All employees who intend to take vacation between June 1 and September 15 should have their vacation request form turned in to Personnel by April 15, 1991. Remember, all vacation request forms must be approved by your department manager.

Forms can be sent to you via company mail. Call Extension 345 for information or to obtain a vacation request form.

BC/mt
Appendix E

Questionnaire

Name: ___________________________ Date: ______________ Control Number: ____________

Directions: Please check the most suitable response to the questions below:

1. I currently use WordPerfect:
   - Not at all
   - Very little
   - Some
   - Frequently
   - Extensively

2. As a result of this training I expect to use WordPerfect:
   - Not at all
   - Very little
   - Some
   - Frequently
   - Extensively

3. I prefer to learn about computers:
   - On my own
   - As part of a group

4. I prefer to learn about computers:
   - In a classroom/instructor format
   - In an audio/visual setting
   - From books, manuals and other literature
   - By exploring the product without guidance

5. In order to start WordPerfect you:
   - Press the F10 key
   - Type WP at the C:\WP51 > prompt
   - Type WORD where it says Enter
   - None of the above

6. Wordwrap means you do not have to press the enter key at the end of each line:
   - True
   - False

7. WordPerfect inserts special codes in your document, such as tab codes, center codes, underline codes and hard return codes. In order to see these codes you:
   - Press the F10 key
   - View your document from the Print menu
   - Press the Alt F3 (REVEAL CODES) or the F11 key
   - It is impossible to see these codes
   - None of the above

8. Right justified means a document has a "ragged left" margin:
   - True
   - False

9. You can access WordPerfect pull-down menus by:
   - Pressing Alt- =
   - Pressing F7 N Y
   - Pressing \X
   - WordPerfect does not have Pull-down Menus
   - None of the above

10. You can use a mouse in WordPerfect to make menu selections, position the cursor, or block text:
    - True
    - False
Appendix F

Human Subject Review Board Letter of Approval

February 4, 1991

Principal Investigator:

It has been determined that the following project is exempt from review by Oregon State University's Committee for the Protection of Human Subjects under guidelines from the U.S. Department of Health and Human Services:

Principal Investigator: Henry J. Sredl

Student's Name (if any): William D. Carter

Department: Post-secondary Education

Source of Funding:__________________________________________________________

Project Title: A Comparison of Instructor-Led and Interactive Video Training for the Personal Computer Application to Wordperfect

Comments:______________________________________________________________

A copy of this information will be provided to the Chair of the Committee for the Protection of Human Subjects. If questions arise, you may be contacted further.

Redacted for Privacy

Mary H. Harkins
Research Development Officer

cc: CPHS Chair
January 4, 1991

William Carter Research Associates
2659 Commercial Street S.E.
Suite 210
Salem, OR 97302

Dear Bill:

Enclosed is our 2-volume video training package for WordPerfect 5.1 that you requested for your study.

Thanks for agreeing to share the results of the study as well as any status reports with me as well as letting Anderson Soft-Teach use the results for marketing purposes.

If any questions about our products come up while you are conducting this study, please give me a call.

Sincerely,

Redacted for Privacy

Matt Rush
Marketing Program Manager
TO: BRANCH MANAGERS
CCA MANAGERS
COUNTY DIRECTORS OF COMMUNITY CORRECTIONS

FROM: NELL KLUMPH, MIS-STUDY TEAM

DATE: FEBRUARY 8, 1991

SUBJECT: WORDPERFECT 5.1 TRAINING FOR COMMUNITY SERVICES PERSONNEL

The Department has the opportunity for 65 staff to participate in 10 hour WordPerfect 5.1 training classes at no cost. This is through a doctoral thesis conducted by the Northwest Computer Learning Center, on the benefits of instructor-based training vs. video-based training. Participants will be assigned to one of two groups, and each group will participate in two five hour training components.

The group receiving video training will complete computer hands-on training, aided by video instruction. The group with the instructor will complete the identical training with a trained instructor instead of a video.

- Participants will need to complete a five minute demographic survey, a post test at the end of the first session, and, an evaluation of the class.
- A second performance test will be conducted at the beginning of the second session to measure the effect of the previous training.

Once assigned to a group, the participants need to remain that group. To avoid scheduling problems, there will be a number of training days and times made available to both groups. Individual information obtained from the study will be confidential, but the Department will have access to the group results. The participants must agree to complete both five hour training sessions. The first session will be held during February and March, and the last session will be held in April and May.

We are coordinating this project through Community Services Training Advisory Committee and the Executive Department. Training will take place at Northwest Computer Learning Center offices in the Portland and Salem areas. Training slots are available on a first come, first served basis, and are open to Clerical, Parole Officers and Managers needing training. It is a unique one time opportunity to train a large number of staff on entry level WordPerfect. Comparable training classes in WordPerfect cost anywhere from $100.00 to $200.00.

If you are interested in having any of your staff participate, please complete the attached form and send it to me at the address on the form. If you have any questions, please call me at 378-2408.

cc: Management Team
TAC/Bill Bouchor

AN EQUAL OPPORTUNITY EMPLOYER
COMMUNITY SERVICES WORDPERFECT TRAINING

If you are interested in obtaining training in WordPerfect 5.1, (WP5.1), for your staff, please fill out the following information and return it to:

Nell Klumph, c/o Information Services Unit, Dome Building, 2575 Center St. NE, Salem, Oregon 97301, Phone # 378-2408.

Nell will need the information no later than February 19th to make arrangements for class instruction and schedule training dates. If you wish you may fax the information to her at 378-4285.

OFFICE: __________________________ PHONE __________________________

CONTACT PERSON: __________________________

Has your office already purchased copies of WP51? yes__ no__

A. If you answered yes, how many people within your office need training? ______

B. If you answered no, do you plan to purchase copies of WP51 within the next two months? yes__ no__

1. If you plan to purchase WP51 within the next two months, how many people within your office will be needing training? ______

TRAINING REQUEST LIST

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