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ABSTRACT

A training module developed following the Instructional System Design model was implemented at Nassau Community College (NCC) to teach its administration, faculty, and staff members computer skills that would enable them to use the available computer equipment more efficiently. Using this module, each trainee designed a file to be used for the storage and retrieval of data about a single topic using the software package "Q & A," an integrated, menu-driven software package that includes word processing, database management, utility modules, and report-creation capabilities. Gagne's nine instructional events were used to develop the learning activities, and the transfer of skills to the job was incorporated into the training as part of the program design. Questionnaires were used to ascertain the trainees' needs, and a formative evaluation of the course materials was conducted. The summative evaluation was based on a questionnaire to measure the participants' reactions to the course, a posttest and checklist combination to measure learning, use made of the database "FILE" on the job to measure behavior changes, and the benefits transferred to NCC offices by personnel using FILE to do their jobs more effectively to measure the results of the course. Additional materials contained in nine appendices include sample instructional material sets and both needs assessment and course evaluation questionnaires. (33 references) (SD)

THE SCHOOL OF MEDIA AND ARTS

of

NEW YORK INSTITUTE OF TECHNOLOGY

announces the

Final Examination

of

Harriet Ziskin Goodman

for the degree of

MASTER OF SCIENCE

in

TRAINING AND LEARNING TECHNOLOGY

A Database Training Module for Nassau Community College Staff and Faculty

Abstract

This thesis/project details the development of a database training module for the faculty and staff of Nassau Community College (NCC). The trainees design a file to be used for storage and retrieval of data about a single topic related to the software package Q & A produced by Symantec Corporation of Cupertino, CA. The training is for the administrative, faculty, and staff members who need to use personal computers on a daily basis at NCC to perform their jobs. The files designed by the trainees can be used to produce reports based on the data in the file.

The training program is held on campus in the NCC computer lab. The program consists of seven weeks of training. Four of the hours are in the design and use of a database. The methods and procedures include hands-on computer experience using a personal computer, the Q & A software package, and handouts developed for this program. This document includes the testing and evaluation instruments used in the training program. The program results in the use of Q & A as a "tool" for data storage and retrieval.

Friday, January 26, 1990 at 9:30 a.m.

in

Conference Room, French Chateau
Old Westbury Campus
Old Westbury, NY

A DATABASE TRAINING MODULE FOR NASSAU COMMUNITY COLLEGE STAFF AND FACULTY

a

THESIS/PROJECT

by

HARRIET ZISKIN GOODMAN

submitted to the faculty of the
School of Media and Arts

of

NEW YORK INSTITUTE OF TECHNOLOGY

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

in

TRAINING AND LEARNING TECHNOLOGY

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CHAPTER ONE

INTRODUCTION

Overview

This document presents the steps used in the development and delivery of a training program for the administration, staff, and faculty members at Nassau Community College (NCC). The training program was in the use of the software program called Q & A. The Instructional System Design model was followed throughout the project. All procedures, instructional materials, and evaluation results are contained within this project.

Background

How many computers did you say we have on campus? The question was asked and an answer had to be found. The burgeoning use of computers in educational institutions by students is well known. Students use computers for coursework, to do homework and to prepare for the business world. The use of computers by educational staff and faculty members has not progressed as quickly. In many cases the equipment is available but the human resource does not know how to use the equipment.

The need for training in the use of computers and software was determined by a survey. The first survey was conducted by the Management Information Systems (MIS) staff in 1987. The survey counted the number of personal computers available on campus for administrative, academic

and student use. The results of the survey, available in Appendix A, were presented to the Committee on Computer Purchasing Agreements who were authorized to purchase and recommend software and hardware. The committee members decided that it was necessary to develop a staff training program to make better use of the equipment being purchased. The committee members also decided to standardize on three software packages that would be supported for college-wide use. Technical support and training would be provided for the users in these software packages.

Decisions to purchase software packages, prior to the formation of this committee, were made based on individual preference. The faculty or administrative user who had a home computer wanted to continue using familiar software. The usual criterion was personal preference based on what was on the market at the time. Also, the operating principle in selecting software was what is first learned is best liked.

Statement of the Problem

Nassau Community College had computer equipment that was under used by staff members. A training program to give staff members the skills they would need to use the equipment was implemented. The committee made decisions to standardize on several packages that would meet the needs of the college community. The packages included a full featured word processor, a spreadsheet being used by the State of New York for budget purposes, a popular database

and Q & A for its ease of use. Orders were placed to purchase these products with the commitment that MIS staff would provide support and training. The designer of this project was asked to develop a training program for the software package called Q & A. The availability of the training program was publicized in the MIS newsletter, PC\PROMPT, and a general in-house mailing was sent to 1,340 staff members on campus. The response from the mailing indicated that the need and desire for training was shared by staff members.

The "tool" called Q & A is an integrated software package produced by the Symantec Corporation. It is a menu-driven program that encompasses word processing, data-file management and utility modules. It also has an Intelligent Assistant (IA) module that is used with FILE to create reports easily. Questions may be asked of the IA in simple or compound English sentences. The results of the questions may be printed in a report form. The program is typically used for creating and maintaining customer lists, mailing labels, and letters, and for keeping track of inventory, expense reports, projects and sales. The program is considered "user friendly" because of the menus and has a shorter "learning curve" than other applications software packages that the committee reviewed. Training in this software package gave NCC users a background on which to build computer skills. As a result users were expected to make more effective use of their computers.

Purpose of the Project

The purpose of the project described in this document is specifically for the trainee to learn to use the FILE management module of Q & A. The trainee would design a file to be used for storage of data about a single topic. Once the skill was learned the trainee would create files for storing and retrieving information that would then be used to produce reports based on the data in the file.

Definition of Terms

Certain terms used in this project are part of the applications software package and will be used in describing the methods and procedures section of the project. These terms are also used in other database programs and the training professional who uses computers should be familiar with them.

FILE management -- is the term Q & A assigns to its database.

Database -- is a collection of filled-out forms which have the same design and are stored together on disk under a particular file name.

Label -- tells what kind of information goes in the information blank that follows the field name.

Field -- the label and information blank make up the field.

Template -- is a form design; fields arranged on the screen to which information may be added.

Record -- is a filled out form.

Menu -- is a list of choices from which the user picks the function to do.

Spec -- contains information Q & A requires to help you design your FILE.

Global -- affects all occurrences of the same information.

Format -- are the options you assign a screen that effects what you see and your presentation of information.

Assumptions

1. That the administrative, staff, and faculty members want to use their computers more effectively.

2. That Q & A will be an effective tool for word processing and file management functions for the administrative, staff, and faculty members.

Limitations

1. That this project was developed at Nassau Community College to increase the effectiveness of the computer users at the College. The training was designed to increase skills for personal use as well as job use. The training is designed for adults.

2. That this project was developed to use the equipment and media available in a computer lab setting. The instructional module designed for this training may not be suitable for use in other locations or settings without proper modifications.

Method and Procedures

The method used in developing this training plan is based on the Instructional Systems Design Process. The model referred to as the Interservice Procedures for Instructional Systems Development (Center for Educational Technologies, 1976) was developed at Florida State University. This development process is detailed in Dick and Carey (1985). The training process consists of five related components referred to in this project as: analysis, design, development, implementation and evaluation.

Analysis

The designer of this project reviewed the job tasks of the human resources, hereafter referred to as staff members, through observation. Using Malcolm Knowles' (1987) model, the training program was based on the andragogical approach on how adults learn. The designer took into consideration the staff members:

1. Need to know why they were to learn file management
2. Self-concept and decision to participate in the training; being responsible for using what they learned
3. Experience--staff members came to the training with skills to build on and different backgrounds and motivations for attending
4. Readiness to learn because the training was task-centered

Design

The designer surveyed several database applications software packages available on the market. The design

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Design

The designer surveyed several database applications software packages available on the market. The design

concepts in these database packages made some easier to learn than others. The designer decided to follow the andragogic model. She designed the training to build on the past experience of the staff members. Q & A is a program that allows users to progress from one module to the next. The tasks included in the design follow the program's progression.

After the tasks were recognized, the next step was to develop the learning objectives. The objectives were developed according to Mager (1984). Each of Mager's objectives contains three parts:

1. Performance -- what the trainee will do as a result of the training

2. Conditions -- what environmental conditions exist while the trainee performs

3. Criteria -- what are the requirements that the trainee must meet

Development

The designer developed the training plan using the guidelines of instructional events described in Gagne (1985). The methods of instruction included lecture, hands-on computer experience, and discussion of questions. The media included handouts, dryboard, and computers with software.

Implementation

The instructional designer administered the training program according to the designed plan. The course was

delivered three times. Each session was planned for two hours a week over a six week period.

Evaluation

No one-on-one evaluations were done. The need for training put the designer directly into a group situation. A small group and pilot test were delivered for evaluation. Data was solicited from the trainees before and after the training using questionnaires. The formative evaluation resulted in changes to the handouts and the number of training sessions. The summative evaluation provided information from trainees.

Summary

The training program designed for Nassau Community College personnel involves building on what they know and need to know. The program was developed to improve job performance using a specific software product, Q & A. Because the facilities are available on campus the training is structured during working hours. The program was based on the ISD model and allows for expansion to the other four modules in the Q & A program.

CHAPTER TWO

ANALYSIS

Introduction

The first step in the Instructional Systems Design process is analysis. During this step the designer identified and analyzed the training needs of the staff members at Nassau Community College.

The designer used observation as a means to identify needs. While observing staff members at their work stations it appeared that much of the work being produced could be done more efficiently with a computer.

Needs Analysis

In an organization, the decision for training usually is initiated by someone who finds there is a problem in some job performance. Specifically, there is a lack of job performance because something is not being done. The gap between the present performance and the expected performance is the area in which training is needed. The computers at NCC were not being used to their fullest extent. The staff members did not know what could be done with them. For computer knowledge to be useful a relationship between the new knowledge and what the learner already knows needed to be established. Some of the benefits of using a computer for the learner are:

1. Doing a familiar task better or more efficiently.
2. Doing the task will lead to other rewards such as

preventing problems, avoiding overtime, or gaining peer recognition.

3. The task helps achieve a personal goal, such as career advancement.

Staff members were using typewriters to produce letters, lists and memorandums. Using a computer would eliminate the need to retype when changes or errors were made to the document. Correspondence and envelopes were typed one at a time. The mail merge capability of a computer word processor would allow mass production and personalization of this clerical task. A lack of computer knowledge was evident in the procedures being used to produce work prior to the training program. Using a computer to do the job would provide benefits to the staff member.

In this case, the training was initiated by the Directors of MIS and ACS (Academic Computer Services) for people to learn to use Q & A. The decision to use Q & A was based on a survey, shown in Appendix A, taken to determine the number of computers available at NCC. The combined, installed and on-order, totals shown in the survey indicated that 500 to 600 computers were available for academic and administrative users. To make better use of the computers, software packages for word processing, databases, and spreadsheet were reviewed by a committee of experienced users. The committee chose to support two packages for immediate staff training; one of them was Q & A. Based on the survey the committee established that a need existed:

1. to provide training for staff members who had no experience with word processing

2. to provide training in the FILE Management (database) capabilities of Q & A for staff members

To determine the trainees' needs the designer used a data questionnaire shown in Appendix A. The training was designed to facilitate the acquisition of content by the learners as suggested by Knowles (1987). Using the trainees' experience, interest, and participation the training was designed to be task oriented.

Job Task Analysis

A task analysis is a sequence of steps broken into job tasks that are performed with a particular outcome in mind. The tasks that are being taught may require prior tasks to have first been learned. Gropper and Ross (1987) state that "learning order can make a difference."

The tasks of the clerical staff members depend on their job description. Some of the tasks originally identified were:

1. Answer telephone and take messages.
2. Track schedules of faculty members.
3. Use word processor (Exxon or Displaywriter).
4. Sort and distribute mail.
5. Handle time sheets.
6. File correspondence, etc.
7. Make travel arrangements.
8. Greet visitors.

As the list grows it is apparent that there is no official job

task that includes the use of a personal computer. Since a personal computer is now a component part of the clerical staff member's desk, the designer added the following task to the job task analysis.

9. Use a personal computer for word processing and data file management.

A full description of the clerical staff members job tasks is available in Appendix B.

Target Population Analysis

The target group for training included NCC personnel in all job functions. Participation in the training was open to those who met the following criteria:

1. a personal computer for use at the work station or in the department
2. completion of a DOS (Disk Operating System) course
3. permission of the head of the department

"It is important to identify the major characteristics of the target population so that potential users of instructional materials will have such a description" (Dick & Carey, 1985). The designer considered these characteristics when planning instruction.

Basic information about the trainees in the target group was gathered through the use of the questionnaire in Appendix A. Its purpose was to provide information about the participants' backgrounds in computers personal interests, work experience and what their expectations were in this training course.

The group members were asked to complete a DOS course given in-service at NCC before registering for the course in Q & A. The DOS course provided background needed to name files developed in the training course.

The groups consisted of 17 men and 31 women between the ages of 27 and 62 as shown in Table 1. The job categories included clerks, secretaries, department directors, a data processing manager, data processing supervisors, administrative assistants, librarians and library clerks, and Deans of Instruction. Civil Service titles include managers under clerk titles.

Table 1

Composition of Trainee Groups

	Trainees	Men	Women	Age Range
Total Trainees	48	17	31	27-62

The ages of the participants in the small group ranged from 30-62. Eleven of the 16 original trainees had either taken NCC's DOS course or had a computer at home. Several of the group members planned to transfer the skills learned in training to home use as well as using their skills for the job. Their interests varied, ranging from reading, gardening, crafts, photography and shopping to sports, music, politics, and art.

Some of the participant-stated expectations for this course were as follows: word processing, file management, mail merges, setting up a purchase requisition system, generating labels, transferring Lotus 1-2-3 and DBase Three Plus files to Q & A for office billing, etc. and becoming comfortable when using Q & A.

The members of the Pilot Test Group consisted of three clerical people, eight professionals, two people from the physical plant and one teacher-aide. Their ages ranged from about 27-50. Their interests include stamp collecting, music, cards, crafts, sports, travel, etc.

The field trial group consisted of four clerical workers, two nurses, one counselor, one technical assistant, one multi-keyboard operator, two professors, one librarian, and one computer operator. Their ages ranged from 35-50. Their interests include crafts, reading, bonsai, sports, photography, etc. The educational level of the participants varies from high school and business school backgrounds to doctoral recipients.

Some of their reasons (non-prioritized) for attending the course are:

1. to upgrade job skills
2. to meet promotional qualifications
3. to make their jobs easier; to avoid overtime
4. to learn to use a computer

Organizational Constraints

The constraints were characteristic of many organizations. The primary constraints were time and space. The trainees had to schedule time away from their desks for training. The computer lab had to be scheduled for the in-service course. This deprived NCC students the use of the lab during this time period. The IBM lab has 16 computers in it which limited the class size to 16 people.

The designer developed the training program for 12 hours over

a six week period. The FILE management module was scheduled for three and a half hours beginning the third week of the training course. Following the evaluation process the designer increased the time to 14 hours over seven weeks. The FILE module followed training in the use of the word processor.

The following list indicates the type of resources needed to provide training:

1. Approval of MIS director
2. Approval of ACS director
3. Approval of head of departments whose personnel attended the course -- release time from job for training
4. Approval of the Comptroller's Office for state aid to be forthcoming
5. Office of Institutional Research -- provided documentation of course duration and attendance
6. Software: copies for each student
7. Hardware: personal computers
8. Demonstration system for trainer
9. Library Computer lab for scheduling of training

The other major constraint the designer found was the physical layout of the classroom. A prerequisite for effective learning to take place is the establishment of a climate that is conducive to learning (Knowles, 1987). The climate of the training situation can be controlled by the designer. The climate of the institution is limited by the physical space. A computer lab with demonstration equipment that is viewable from all parts of the room is

basically trainer oriented. Attention is directed towards the instructor who controls the demonstration equipment. As a result, interaction is limited between the class participants.

Instructional Goal

The goal is for the student to design a file to be used for storage of data about a single topic using the software package Q & A. The student will design the file as part of the FILE management module. Once the skill is learned the student will create a file for storing and retrieving information that can be used to produce reports based on the data in the file.

Dick and Carey (1985) list criteria for an instructional goal. The four criteria are:

1. that it contain a clear, general statement of learner outcomes
2. that it describes what the learner will achieve
3. that the goal be related to an identified problem and needs assessment
4. that the goal can be achieved through instruction rather than otherwise

To plan learning experiences for this group their individual interests, such as Christmas card lists, or job needs, such as department personnel and room locations, lent themselves to setting up lists of data. The data in the lists were then manipulated to produce information that was used by or for the learners. For instance, an interest in sports was converted to a file on teams and players, collections of baseball cards, autographed balls, newspaper clippings, etc. An interest in photography was converted

to lists of equipment, locations where pictures were taken, and books on the subject. Any of these interests lent themselves to creating a data file (list) that the student used to look up information. They then generated written reports from the file. Creating a file that allows the learner to make real use of the data provided an incentive to use FILE.

The selection of media for this training program was limited by the need for hands-on use of a computer. Additional media as suggested by Anderson (1983) included the use of handouts, an Electro-Home projection device connected to a computer, a demonstration computer attached to large monitors and a dryboard for notes. The designer would have liked to use an overhead projector but did not have time to produce transparencies for the notes. The hands-on experience for the trainees provided for interaction between the trainee and the instructor.

Literature, Existing Courses, and Material Review

The designer examined literature and articles on databases and adult learning methods. Some of the material and theories could be incorporated into the training plan.

Related Theory

According to Gagne's domains of learning this project is classified as being in both the intellectual and affective domains (Dick & Carey, 1987). Intellectual skills require the learner to solve a problem or perform an activity with previously unencountered information or examples. The affective goal is

expressed in terms of learners choosing to do something. The affective goal takes a longer period to develop.

The intellectual skills consist of four categories: discriminations, concepts, rules and problem solving. Discriminations help determine whether two things are alike or different. Concepts can classify things according to labels and characteristics. Rules are applied to concepts. Problem solving depends on applying the other three intellectual skills.

The designer's analysis showed that the trainees, by incorporating these skills into their learning, could apply the skills to creating and using the FILE function in Q & A. The trainees, by sharing the knowledge they gain with other office workers, demonstrate that affective learning has taken place.

The facilitation theory introduced by Rogers (1969) emphasizes the learner as an active participant in the learning process. The relationship between the learner and the instructor places the instructor there as a guide or aid to learning. The instructor is more flexible in thinking, more open to students' feelings, more accepting of other ideas and accepts feedback from students as it provides insight into themselves and their behavior.

Literature Review

A literature search was conducted at Nassau Community College based on the findings of a computer database called Dialog. These findings provided the designer with information available for the last three years, 1986 - 1989. The search strategy followed a pattern of narrowing topic headings. The topics began with broad

subject areas such as databases and adult learning combined with educational theory. This search provided the designer with 17,134 sources of information on databases: 2,247 sources on word processing; 6,330 sources on learning; and 407 sources on adult learning. The topics were then narrowed to history and uses of databases, learning theory and andragogy. The search provided the trainer with a computer based bibliography of articles and books on adult learning theory and techniques, as well as, background on database use and history. The designer found 18 sources that were related to the project. Those sources actually considered are:

1. Watson, E. (1980). Small Group Instruction. New Directions for Continuing Education, 6, pp. 55-63.

The text discusses trends in small group instruction affected by the return of adults to educational institutions. Use of structured, learner centered methods by instructors enable higher levels of learning and peer support for adults.

2. Hendrix, G. (1989, March). AI Power to the People. PC Computing, p. 70.

Hendrix, founder of Symantec Corporation, wrote this article on the history of the development of the Q & A program. Two technologies were merged, personal computer experience and artificial intelligence, to produce a database with powerful features. A word processor was added to the database to provide a "user friendly" software package.

3. Dwyer, C. (1987, Winter). Microcomputer Literacy and Andragogy. Media and Adult Learning, 9, pp. 27-30.

In this era of increasing microcomputer use Dwyer relates Knowles' assumptions of andragogy to classroom instruction in the use of computers. While restating Knowles' assumptions Dwyer provides practical examples of how to apply each assumption in an adult class in computers.

4. Irwin, M. & Young, D. (1988, April). Integrating computers into adult literacy programs. Journal of Reading, 31, 648-652.

Young and Irwin describe ways in which word processing and databases can be used in literacy programs. Using databases allows people to organize and locate information readily. The authors use as examples creation of a word bank as a student learning activity, leaving messages to be searched for by students, creation of subject databases to aid in reading practice and keeping records of materials read by students in a database.

5. Bilof, E. (1987, Jan./Feb.). How to design and use a culture area database with PFS:FILE and PFS:REPORT. The Social Studies, pp. 35-41.

Bilof wrote this article from the perspective that databases are designed to manage information. He wrote this article for social studies teachers who he considers to be information managers. How to use PFS:File and PFS:Report are described in detail and examples are related to cultural areas within a social studies curriculum. Q & A is based on PFS:File.

6. Ralston, A. & Reilly, Jr., (Eds.). (1983). Encyclopedia of computer science and engineering (2nd ed.). New York: Van

Nostrand Reinhold.

This section of the book specifically deals with databases. It discusses database terminology and database management systems, for example network databases, hierarchical databases, and relational databases. Also covered is the history of databases and database programming languages.

7. Brookfield, S. (Winter, 1988). Understanding and Facilitating Adult Learning. School Library Media Quarterly, 16, pp. 99-105.

This article is an excerpt from Brookfield's book. It discusses the general nature of adult learning and six principles of effective practice for facilitating learning: (1) voluntary participation; (2) mutual respect; (3) collaborative spirit; (4) action and reflection; (5) critical reflection; and (6) self-direction.

8. Archer, N. (1988, July). End User Software Selection. Journal of System's Management, 39, 32-39.

The growing use of microcomputers is increasing end-user computing. For an institution which is selecting software to be used by its personnel, it is important to take into account the nonexpert users. The number and quality of end user packages has grown, and software evaluation procedures should be refined to meet the needs of a growing user population. A formal software selection process is discussed which provides for input from end users through hands-on evaluation as the final and critical test of software. Software selection techniques have evolved from

internally developed applications software designed by technical systems support staff to the present growth of end user packages in response to market demand.

9. Hedley, C. (1986). Principles of adult learning. Journal of Reading, Writing, and Learning Disabilities International, 2, 359-363.

Hedley includes an extensive bibliography in this article on principles of adult learning. Individualizing learning activities in study skills and study habits can be reinforced through computer activity. She lists materials for these learning activities by dividing them into the following categories:

a. Reading and study skills, including library and reference skills.

b. Career orientation materials.

c. Programs for learning word processing and other kinds of computer skills.

10. Feuer, D. & Geber, B. (1988, December). Uh-Oh...Second thoughts about adult learning theory. Training, 25, pp. 33-39.

The authors review the concept of andragogy and synthesize recent criticisms of this theory. The use of andragogical techniques in job training is discussed. The authors conclude that, despite some weaknesses, andragogy is important in that it makes the teacher sensitive to the needs and interests of the learner. Knowles is referred to regarding recent changes in how he sees his theory. Knowles now sees andragogy and pedagogy as parallel sets of assumptions. The approach used is determined by

the situation.

11. Dalellew, T., & Martinez, Y. (1988, Sum). Andragogy and development: A search for the meaning of staff development. Journal of Staff Development, 9, 28-31.

This article discusses an understanding of adult learning principles that will enable staff developers to select the most appropriate learning environment for participants. The purpose and sample activities that are (a) formal such as instruction and curricular objectives of schooling, (b) informal such as those activities that are part of the socialization process, or (c) non-formal such as opportunities that are self-directed learning environments are presented.

12. Carter, P. (1988, April). Revitalizing society: practicing human resource development through the lifespan. Lifelong Learning, 11, pp. 27-31.

Carter discusses the need to practice sound principles of human resource development in learning environments and to promote a cooperative, creative, collaborative, and participative leadership style in education as well as in industry.

Survey of Existing Courses and Materials

The designer surveyed materials listed in computer magazines and companies that provide training via video and tape cassette. The designer examined materials from the following:

1. Q & A On-Line Tutorial

The online tutorial in Symantec Corporation's, 10201 Torre Avenue, Cupertino, CA 95014, Q & A is built into the program as a

training tool. It cannot be used for the purpose of teaching the FILE section in Q & A because the program has a "bug" (problem) in it in version 2.0.

Texts are developed by publishers to be used instead of the manuals that accompany the software package. Three texts that are helpful and provide additional materials to the Q & A manuals are:

2. Dunlop, N. (1987). Working with Q & A: Practical Techniques in Database Design. Scott, Foresman & Co. The list price is $19.95.

This book is written for new and advanced users. It provides a quick and easy method to solve database problems. It offers practical examples, strategies, techniques and tools to help you do your job. It contains version 2.0. It should be used to provide review of FILE. This book is of value to a new and experienced user looking for examples on how Q & A may be used.

3. Walden J. (1986). Getting the Most from Q & A. Osborne, McGraw, Hill. The list price is $16.95.

This book covers both database and word processing in Q & A. It can help the learner to customize databases, and apply mail merges to files. It is an excellent source for the new user.

4. Harvey, G. (1986) Mastering Q & A. Sybex. The list price is $22.95.

This book covers the modules in Q & A. Some of the features it covers include: formatting, enhancing text, printing techniques, and sorting and reporting from FILE. It offers excellent review features for the user after training.

Plan for Design and Development Effort

The designer used evaluation and review techniques to plan the training program. The project started in September 1988 and ended in May 1989.

Project Plan

The designer used Gantt and P.E.R.T. charts to monitor her progress. These charts helped the designer keep to deadlines for developing the training plan. She also kept a running log. The log contained notes on problems that occurred during the training. Questions that were asked by trainees were listed for further research and incorporated into future training. Project Plan documents are in Appendix C.

The estimated number of hours of student effort is related to the time each student spends in studying. The results of the student effort were based on attendance in the training class. Each student expends a minimum of 12 hours of study time. Additional effort cannot be calculated since time spent studying out of class could not be corroborated.

The labor costs for the project participants were calculated at $18 an hour. The designer's hourly rate was calculated at $13. These hourly rates were calculated based on the monthly salaries of the participants and therefore do not include the cost of employee benefits. Charges for use of the computer lab were based on using 16 computers and a demonstration system. The rate was $75 per hour. The budget is displayed in Table 2.

Table 2

Budget

Category	Hours	Cost	Subtotal	Total
Labor				
Designer				
analysis	20	$ 260		
design	40	520		
development	55	715		
small group trial	12	156		
pilot test	14	168		
field trial	14	168		
revisions	12	156		
Total designer labor costs			$ 2,637.00	
Participants				
small group trial	12	3,456		
pilot test	14	4,032		
field trial	14	4,032		
Total participant labor			$11,520.00	
Total labor			$14,157.00	
Materials				
printing		26		
mailing in-service	2	38		
Total materials			$ 64.00	
Equipment				
Computer lab time	12	900		
Total Equipment			$ 900.00	
Grand Total				$15,121.00

Summary

The analysis revealed that the staff members were not using the computer equipment to its fullest potential and to their benefit. The staff members needed a training plan to give them the capabilities of the computer as a tool. The plan was designed to use Q & A FILE as a tool. The instructional goal was in the intellectual and affective domains of learning. The training was developed to use the learner's experience. Existing courses and materials were examined by the designer. The course was developed with the understanding that actual events may not be the same as those originally scheduled. The events were subject to change based on time and group participation.

CHAPTER THREE

DESIGN

Introduction

The first step in designing a training program for staff members at NCC required identifying the tasks to create a database for instruction. The second step was to identify the instructional objectives based on the staff members' needs. This step was followed by identifying the entry behaviors required to create the database in the Q & A program and planning a sequence of learning activities for the students. Methods for evaluating the instruction and materials to be used are then determined; this would depend on the nature of the instruction, hands-on experien[illegible]. The design phase ends with a review of existing literature and courses.

Instructional Task Analysis

According to Dick and Carey (1985), an instructional analysis involves two major steps:

1. classifying the goal into a domain of learning, and
2. identifying and sequencing the major steps required to perform the goal.

The tasks of the staff members depend on their job description. In this case the existing job description did not mention computers as a tool. The tasks that follow were developed by the designer for this training program. To use a computer more effectively the staff member has to know where the

on/off switch is; be able to press the correct keys on the keyboard to get recognizable words; recognize the functions of the special keys to execute keyboard commands, and recognize the choices on the program's menu and what each choice will do. The specific tasks for the FILE are to:

1. Create a file.
2. Design a form.
3. Identify and assign information types to the fields in the FILE form.
4. Understand and apply global format options.
5. Design and use FILE as a means of storing and retrieving information.

Instructional Objectives

The instructional goal is defined as being in the intellectual domain of learning. Part of the instructional goal is also in the affective domain. The goal is to create and use FILE to store and retrieve information. The staff member will do this to make the job more efficient. The information would be stored thereby allowing repetitive use of it.

The objectives according to Mager (1984) should have three parts: performance, conditions, and criterion. Mager says objectives are important for a number of reasons: (1) selection of materials, content or methods are based on defined objectives (2) has the objective already been accomplished or is it a real need and (3) clearly defined objectives provide students with the

means to organize their own efforts toward accomplishment of those objectives. Mager also considers the issues of whether the objective is worth teaching and worth the time and effort to be accomplished.

The objectives of the instructional strategy described in this document are:

1. Given the program Q & A, the student creates a file (database). The file contains data that can be retrieved and used for reports.

2. Given the program Q & A, the student creates a form. The form stores information in a new file.

3. Given the program Q & A, the student assigns information types to the fields in the file. The information types define the kind of information the field will contain.

4. Given the program Q & A global format options will be chosen. The options are choices such as decimal placement (e.g. .01., .001, etc.), American or European representation of money (e.g. $130.40 or $130,40 for a money field), or date format (e.g. mm/dd/y or dd/mm/y). The options selected are based on the recognition by the viewer of the information in standard formats.

5. (affective)--Given the choice of using a file in Q & A as part of the work situation the trainee chooses to use it to store and retrieve information. The student uses the information to produce reports, to use mail merges for letters or memorandums, or to produce mailing labels or labels for office use. The student chooses to use the File function each time a list can be

used for more than one purpose. The list of performance objectives is in Appendix D.

Entry Behaviors Defined

Using the module progression in Q & A as a basis, the designer will require the following entry behaviors or skill levels for a trainee to continue in the program to learn the FILE module.

1. Use a computer.
2. Use the keyboard layout.
3. Demonstrate the functions of the special keys (Ctrl, Alt, Del, Ins, Scroll lock, Prt Scrn, Pause, Esc, Num lock).
4. Demonstrate how to use the basic functions of the word processor.

Group and Sequence Objectives

The order of the learning objectives follows the instructional objectives described above. Therefore, there is no need to resequence the objectives. A summary of the sequence is available in Table 3.

Learning Activities Specification

The instructional project is divided into several learning activities. The plan is for three and one-half hours of instruction in the use of FILE. This would be covered in two two-hour sessions scheduled once a week. The instruction in FILE

Table 3

Sequence and Cluster Objectives

Lesson	Instructional Goal	Objectives
Lesson 1	Introduction	1.1
	Entry Behaviors Tests	1.1
	Keyboard Test	1.2
	Word Processing Test	1.3
Lesson 2	Designing a file	1.1--1.3
	Creating a form	2.1--2.4
Lesson 3	Assigning information types	3.1--3.3
Lesson 4	Choosing global format options	4.1--4.2
	Post-test--Performance Test	

would follow the completion of the word processing module in Q & A. The relationship to the FILE module is introduced at the last session on the word processor prior to training in FILE. The designer connected the two modules using the merge function capability between the word processor and FILE.

The class is designed to begin with an introduction of the topic (objective) to be covered. Two entry behavior tests (paper and pencil tests), found in Appendix E, will be given as part of the introduction to insure that the skills needed have been learned. The instructor will use lecture/discussion and guided practice as the methods to present information. The trainees will follow the instructor's example on the monitors connected to the computer. The trainees will have handouts with information on the FILE. As the instructor talks, the trainees will use computers to practice what is being done on the monitor. As each lesson progresses, the instructor provides examples and exercises in the form of printed materials and sample files on floppy disk

for the objectives to be accomplished. Other information and explanations needed by the trainees such as mathematical order of precedence is written on a dryboard.

Table 4

Learning Activity Instruction Strategy Matrix

Learning Activity	Method	Media
Design a file	lecture	computer/handout
Create a form	discussion	computer/handout
Assign information types	guided practice	computer/handout
Choose global format options	discussion	computer/handout

Assessment System Specification

Gropper and Ross (1987) feel that tests provide evidence about the adequacy of a training program. Tests done during development provide for information that can be used to revise instruction. For management, tests provide feedback about trainees' progress as well as about the continuing effectiveness of the program.

The designer developed entry behavior tests and a post test for the training program. These are included as Appendices E and F, respectively. The purpose of an entry behavior test is to measure skills which are needed to begin instruction (Dick and Carey, 1987). The two entry behavior tests are designed to

measure the trainees' knowledge of the keyboard and function keys learned in the word processing module of Q & A. Test 1 consists of ten questions worth 10 points each. Test 2 has a review sheet and a matching function key sheet with 20 questions worth five points each. The trainees are expected to do well on these tests because the material will be covered in the two weeks prior to starting the FILE training. A post-test is designed to measure the objectives taught in the instructional program. A checklist will be developed to measure the trainees performance as observed by the instructor. Effective observation of trainees may be improved by using guidelines listed by Phillips (1983). The guidelines are:

1. Observers must be prepared and understand what information is sought.

2. The observations should be systematic.

3. The observers should know how to interpret and report what they see.

4. Tne observers' influence should be minimized.

To make observations more effective, the number of behaviors listed in the checklist should be small and listed in a logical sequence if they normally occur in a sequence.

Scoring will be done based on instructor observation using the checklist. A course evaluation data questionnaire consisting of fourteen items will be administered. It is shown in Appendix G. This will be used to help the instructor measure the trainee's reaction to the training program.

Evaluation System Specification

The formative and summative methods of evaluation will be used in this project. The purpose of the formative evaluation is to provide data for revision of the instruction prior to general delivery. The purpose of the summative evaluation is to decide if the training is valid. Kirkpatrick relates the results of the program to organizational improvement.

Formative

Due to the constraints of time the designer did not plan to conduct one-on-one evaluation. The instructor would progress directly to using the material with a small group for evaluation. The evaluation would determine changes to the materials.

Summative

The purpose of the summative evaluation is to measure the effectiveness of the training program. Kirkpatrick (1987) describes four parts to summative evaluation. The four parts include: reaction, learning, behavior, and results. The designer planned to measure the four parts by using a course evaluation questionnaire to measure the reaction of the program participants; a post test to measure learning; transferral of learning to others as behavior modification; and benefits to the NCC organization through increased productivity using Q & A on the computers by the training program participants.

Learning Transfer System Specification

In order to transfer the training to their jobs the designer used the trainees' needs analysis to design the objectives to

meet their job requirements. Actions that would insure transfer of learning according to Broad (1988) involve the organization, the manager and the trainees. These actions can be taken before, during, and after training. A sampling of these actions are listed below.

Before training management should become involved in the planning to establish organizational needs. The organization's expectations should be explained and time provided for the employees to attend and do what is needed for the training sessions. Attendance should be required and trainees should be selected according to a real need for training. Management should provide work related projects for the trainees to apply the new skills. Trainees should find out what is being required and what is expected of them. The trainees should complete advance work prior to training and participate in the needs analysis and designing of procedures if asked to do so. The trainer should get organizational approval and trainee cooperation by designing the training to be relevant to the needs of both. The trainer should also follow the Instructional System Design model.

During training management should provide substitute personnel to handle the work load to prevent distractions to the trainees. Management should help trainees to realize goals and skills and provide feedback to maintain interest. Management should participate in a "training transfer" session to help trainees use the new skills on the job. The trainees can have a

"buddy" to help transfer skills to the job; actively participate in exercises and discussions; form a support group to help each other; and take notes on how to apply the new skills to the job. The trainer should specify objectives; emphasize benefits to the trainees; and provide feedback on skill development to the trainee.

After training management should meet with trainees to encourage use of new skills and how to transfer them to the job; assign trainees to jobs using the skills; include trainees in decisions based on use of new skills; and encourage sharing of new skills with co-workers. The trainee should review course materials, action plans, and job performance aids; and work with the "buddy" to solve problems and improve the transfer of skills. The trainer should provide support and help with problems; follow up the training with individuals or a refresher course; and keep the trainees up to date on new developments to support transfer of new skills.

The designer plans to follow up after the training program. The new skills should be used and shared with others in the departments to which the trainees return because the instructor will ask the participants to bring job related lists that can be incorporated into the design of the FILE during training.

Review and Selection of Existing Materials

At the time this training program is being developed materials applicable to this project are not available. There

are several books available, none of which provide hands-on training. They do provide good material for review after training. Therefore, the designer did not use them to develop this training program.

Summary

The steps used in the design phase of this training plan include a task analysis, a list of objectives, learning activities, and tests for evaluation. The methods and media to be used are dependent on the type of training. This computer training program requires a computer for hands-on experience and demonstration purposes and printed material such as handouts for instruction.

Entry behavior tests and a post-test are given to the trainees. A data questionnaire is used to ascertain trainee needs. A post course evaluation questionnaire is administered to aid in evaluation. A small group, a pilot test, and a field trial are planned and will be implemented. Transfer of training to the job is incorporated into the training as part of the program design.

CHAPTER FOUR

DEVELOPMENT

Introduction

The third step in designing a microcomputer training program, in this project for Q & A, is development. The stages in the process cover planning strategy. Should the training follow the software package or what the learner needs to know? Materials and exercises are developed to encourage new learner behavior using the word processor and database. Evaluating the materials developed requires testing the materials on a sample population. If, after the testing, changes to the outline and materials are needed they are sent back to the designer. In its final form the training program should do what it was designed to do.

Learning Activity Development Scheme

In August 1988, the designer was asked by the Committee on Computer Purchasing Agreements to develop a training program for the College's staff members.

The designer began the development by producing an outline based on the Q & A software package. Since the package had a definite number of modules the outline was developed to follow the natural sequence of the program. Permission to use the student computer lab for training sessions was obtained. The instructional strategy was developed using the equipment available in the lab.

The designer next developed handouts and exercises for classroom activity. The materials were arranged to give the trainees a step-by-step process to follow so they could create their files. All the steps had to be done on the equipment available. All the files the trainees would need for reference or to run the program were developed on floppy disks.

Tests for entry behaviors were developed to ascertain the trainees' knowledge of a computer keyboard and its keys' functions. The entry behavior tests would serve as a review of the word processor key functions in Q & A. The designer tried out the steps in the outline in the computer lab to estimate the time needed to deliver the instruction. This enabled the instructor to use the computer and demonstration equipment for practice so she would be familiar with the equipment. This helped her to try to anticipate problems that might arise during the training session from equipment problems.
The potential for equipment or disk failure was a strong possibility during training. A post test and a checklist for instructor observation were developed to evaluate the trainees' performance.

At this point the designer developed two questionnaires to be used with each training group. The questionnaires were to be used to gather information before and after training.

Learning Activity Development

The training was to be in the use of a commercial program

called Q & A. The permission of the directors of Management Information Systems and Academic Computer Services was obtained. The designer began the development stage by focusing on the training as a hands-on experience using NCC computer equipment. The classroom activity was developed using adult learning guidelines (Cassivi, 1989). The designer used informal methods to extend the knowledge, experience, and curiosity of the trainees. The lecture delivered was designed for the instructor to ask questions of the trainees. The responses elicited from the group were integrated into the learning session. The learning module was based on relating the "tool" to the learner. The instructor, as a mediator between information and individuals, was able to organize the trainees' responses as opportunities for the trainees to learn.

The outline included concepts to be explained and background information to be used in the lecture. The steps, which include hands-on experience for the trainee, leading to the mastery of the instructional goal were to be discussed with the group. The procedure needed to create the file would be explained by consistent use of the Help key (F1). A file to be created as an exercise was designed as part of the lecture and discussion. The information to be part of the file was to be entered in each computer by the trainee. A backup file was available on disk for the trainee to use in an emergency. The sequence for file development includes the following steps: (1) laying out fields; (2) assigning information types; (3) choosing global format

options; and (4) adding data to the file. For each step the trainee would have a screen layout to look at. Data that was to be added to the file was to be given to the trainee with the outline as illustrated in Appendix H.

The software program Q & A 2.0 was transferred to 5 1/4 inch floppy disks for use on the dual floppy disk drive computers in the Computer Lab. Files for use as samples and as exercises were to be copied to a 5 1/4 inch data disk for the trainees' use during the training sessions.

The project described in this document consists of a three and one-half hour instruction module on designing and using a database (FILE). The materials were to be presented in a computer lab classroom located on the second floor of the Library. The learning activities are based on Gagne's nine events of instruction (1985).

1. Gaining attention--the designer would begin the instruction by distributing a data questionnaire to elicit background information from the trainees. She would ask them what they expected from the course; what their computer backgrounds were and how they would use the training.

2. Informing learners of the objective--Since this module follows a training module on the word processor the instructor would ask the participants to bring in a sample of a job related list that the trainee could make better use of in a file form. The objectives would be explained as they relate to the sample files shown by the instructor as indicated in presenting the

stimulus below. The objectives would become clearer as the trainee has a specified outcome to work towards. The completed file would be taken back to the office on a floppy disk.

3. Stimulating recall of prior learning--During instruction the participant would be asked to compare the file being designed to a file drawer in the office file cabinet. Each trainee would be led to recall how their file drawers were organized and apply that prior learning to organizing this computerized file.

4. Presenting the stimulus--Sample files located on the data disks would be used to stimulate thinking about a form layout. Four sample file forms are to be presented as examples. The sample files range from simple to complex designs. Each file form would be related to the College's business forms. The recognition of the forms by the participants makes mastery of the objectives easier.

5. Providing learner guidance--This would be accomplished by verbal directions and reasons why an instruction should be followed. The outlines and screens also provide guidance.

6. Eliciting performance--The trainee creates a file on the computer. The designer observes all trainees as they work to see if problems arise. She also encourages questions while trainees create their designs.

7. Providing feedback--The instructor provides feedback as she moves around the room observing each participant. A hands-on class requires immediate feedback for correct behaviors to be learned.

8. Assessing performance--The trainee designs a database in class as part of the training. The designer observes the trainee during this activity and she uses a checklist to assess the trainee's performance. The checklist criteria match each task objective.

9. Enhancing retention and transfer--The trainee would be asked to design a database that could be used by the trainee's department. The trainee takes the file, which is copied on a floppy disk, to the department after the course is finished.

Learning Activity Review

All materials were reviewed for errors in production and design. Corrections were made to the materials and they were produced for the first training group.

Materials for Evaluation Produced

A set of instructional materials were produced for the instructor. The small group trial was scheduled in November 1988. Sixteen copies of the outline, entry behaviors tests, post tests, and course evaluation questionnaire were reproduced for the training class. The post test checklist was produced for the instructor. The materials were produced on schedule and were ready for a small group trial in November 1988.

Summary

During the development stage instructional materials were

produced. The instructor used Gagne's nine instructional events, an outline and participation through hands-on computer use to develop the learning activities. Other materials developed include entry behavior tests, a post test and performance checklist, and a course evaluation questionnaire.

CHAPTER FIVE

IMPLEMENTATION

Introduction

Having spent the time assessing the need, designing the program and developing the materials the time to try out the program arrives. Will the training program work? If it works, will the audience for whom it was intended use it?

Each trainee gets a chance to try out each of the five modules in the program. For the purpose of this project, the student will design a file to be used for storage of data about a single topic. The student will design the file as part of the FILE management module. Once the skill is learned, the student will create files for storing and retrieving information that can be used to produce reports based on the data in the file.

Materials for Implementation Reproduced

The training plan was used three times. The outline and hand-outs were produced for the participants. Materials for two entry behavior tests were produced for each training session as seen in Appendix E. A post test was administered at each session. The post test was graded on a performance checklist as the trainee was observed by the instructor. The post test and checklist are in Appendix F.

Instructional Delivery

The training plan was used three times between October 1988

and April 1989. It had been used on a more informal basis from September 1987 to October 1988.

The implementation group consisted of a mixed group of administrators, clerical staff and faculty members. Again, this group had varying degrees of experience with personal computers. Some of them have a personal need to learn Q & A in addition to learning the program for the job. The course began with 16 trainees and ended with 13 trainees. Four clerical workers, two nurses, one counselor, one technical assistan , a multi-keyboard operator, two professors, one librarian, and one computer operator completed the course. Their ages ranged from 35-50.

The process used to deliver the training to the trainees includes hands-on computer experience. Trainees are able to visually see what the instructor is demonstrating on an Electro-Home projector and large screen monitors connected to the instructor's computer. The materials used by each trainee included an IBM dual drive personal computer and the Q & A program. The word processor is based on PFS Write and has a short "learning curve." The program's built-in help screens make working with it "user friendly." The FILE management program allows data to be stored, retrieved and generated in a report form. The program also has an Intelligent Assistant (IA) that allows the user to retrieve information by asking questions in English sentences. For example, a user may ask for a list of all employees in the media department hired before January 5, 1967. Q & A will provide a list in a columnar report format. The IA

module followed the FILE module because it is another method that can be used to generate reports from FILE. The outline used for the implementation was changed to simplify the instruction as seen in Appendix I. The front end of the full outline consists of three pages and serves as a lecture guide for the instructor. The instructor discusses and demonstrates the steps to design, create, and add data to a file. The instructor expects the trainees to follow the steps and ask questions that may arise from their doing the exercise. The full outline was revised, clarified and shortened for the implementation, as shown in Appendix I. Actual screens from the Q & A program were reproduced and added to the outline. The screens were produced by using the Print Screen key (Prt Scrn) on the keyboard. The Print Screen key sends whatever text or picture is on a computer screen to a printer via a printer cable that is attached to the computer and the printer.

This section of the instructional delivery was designed to take 2 and a half to 3 hours over two two-hour sessions. Time for questions during the training session was anticipated.

Entry behavior tests for Q & A's word processing functions were given. The tests are paper and pencil tests requiring cognitive skills. Two tests were administered. The first test requires recognition of the parts of a keyboard. The second test requires the recognition of the uses of the function keys in Q & A. The behaviors are transferable to the FILE management module of Q & A and will be administered during the first hour of

this training session.

Training in FILE follows the entry behavior tests. The trainees follow the menus in Q & A to design and create a file. The outline and the lecture follow the Q & A program's built-in progression from screen to screen. An exercise, to guide the trainees, is part of the outline. It also provides uniformity and ease for the instruction so the instructor is able to observe and evaluate student progress and problems. Student practice is built into the outline. The instructor expects questions based on this practice. Sample files, on the disk, are used for demonstration by the instructor. The instructor had a problem with the demonstration system for the file management module. As a result the instructor shortened the amount of information given to the trainees and concentrated on more hands-on at each computer. A performance post test was given at the end of the training to evaluate trainee learning. A summary of the results is in the summative evaluation, chapter six.

Data Collection

At each trial, the students completed a data questionnaire and a course evaluation questionnaire. The data questionnaire was given before training began. It was designed to elicit their computer background and expectations for the training. The course evaluation questionnaire is to measure their reaction to the class. The questions include their opinions on the course content, instructor and delivery method, and recommendations to

improve, or comments on, the course. The results of the questionnaires are in Appendices A & G. The summary of the results is in chapter 2.

An entry behavior test was administered to ascertain the trainees' knowledge of the keyboard and Q & A's commands using function keys. Both tests are in Appendix E.

A post test was administered to evaluate the learning that takes place. The trainees are required to create a new file, save the file and add data to the file. The test was hands-on using a computer. A performance checklist was used by the instructor to record the trainees' performance. The test is based on the instructional objectives as stated in chapter 3.

Summary

The revised training plan was delivered. Materials used include a computer, Q & A software, and instructor developed materials.

The methods included lecture and demonstration of the FILE module. The media consisted of hands-on computer experience using handouts with exercises to be done in FILE. Changes to shorten the materials used in the course and lengthening the time needed for delivery of training resulted from the evaluation questionnaire. Outlines, tests and checklists were part of the materials used to assess learning and attitudes.

CHAPTER SIX

EVALUATION

Introduction

Evaluation is used to collect data during the development of instruction, as well as, to revise and improve the effectiveness of the instruction. Evaluation is divided into two phases: formative and summative. Each phase provides information to be used to make changes to the instruction.

The small group trial followed the full outline. It contained a lot of material and could not be covered in 3 and a half hours as planned. As a result the outline was revised to cover less material. Also, in the small group the formal need for testing was not utilized at that time. It was not considered "politic" to give the managers of the College tests. This is no longer true. All program trainees take the tests. A data collection questionnaire was given to find out why these people came to the course and what they expected from it. A course evaluation questionnaire was given at the end of the course.

The pilot test lasted seven weeks. Entry behavior tests and a performance post test were introduced. A checklist was used by the instructor to evaluate student learning.

Formative Evaluation

One-on-One Trials

Gagne (1987) states that there are three phases of formative evaluation, one-on-one, small group, and field trials. For

purposes of this training plan one-on-one evaluations were not conducted. There was not enough time to test on individuals.

Small Group Trial

The first delivery of the training course was in a small group. The group started with 16 trainees because the computer lab has 16 computers. Since they were all managers their attendance was subject to their schedules. Attrition in attendance was due to scheduling problems. Several managers had to drop out of the group.

Small group trials are used to determine if changes are needed to the instruction and what problems students may have. The instruction developed for this training is called instructor presented instruction as described by Dick & Carey (1987).

The full instructional outline was used for the small group training. This group had six weeks for the training. The File section took three hours. The group consisted of managers of several departments. Civil Service titles include managers under clerk titles. There were six men and eight women. Their ages ranged from 30 to 55. Eleven of the trainees had either taken NCC's DOS course or were familiar with DOS. Their expectations for the course included word processing, file management, mail merges, transferring Lotus 1-2-3 and DBase Three Plus files to Q & A for office billing, etc. Outside interests varied from reading, gardening, and photography to shopping and sports.

To plan learning experiences for this group, individual interests or job needs lent themselves to setting up lists of

data. The data in the lists could then be manipulated to produce information that could be used by or for the learners. For instance, an interest in gardening can be converted to a file on species, books, diseases, etc. Any of the interests lent themselves to creating a data file (list) that the student could use to look up information. They can also generate written reports from the file. Creating a file that allows the learner to make real use of the data provides an incentive to use the file.

The outcomes of the small group trial include revisions to the outline and lengthening the course to seven weeks. The materials were revised to simplify the outline. The revised outline consists of six pages and serves as review notes for the trainee after the training is completed. This outline was also used in the implementation. The training was scheduled over a six week period for two hours each week. The FILE section of the training was scheduled for three and a half hours over a two week session starting the third week of training. Evaluation was done using a checklist based on instructor observation of the trainees. Results of the checklist are summarized in the summative evaluation.

Pilot Test

The pilot test group had 16 clerical trainees. The training was extended to a seventh week to include the material that was covered in six weeks in the first trial. The FILE Management module took longer to go through.

A data questionnaire was given. The members of the pilot test group consisted of three clerical people, eight professionals, two people from the physical plant and one teacher-aide. Their ages ranged from about 27 to 62. Their interests include stamp collecting, music, cards, crafts, sports, travel, etc.

The first test on the parts of the keyboard did not give anyone a problem. The trainees were familiar with a typewriter and had completed the word processing module of the training program. They were able to transfer those skills to the computer keyboard. The second entry behavior test on function keys showed that confusion can result if a test does not have a visual to accompany it. The numbers alongside the F indicator were confusing. A keyboard template should be provided with the test. Training will include a review of the keyboard before giving the entry behavior test. The review sheet is in Appendix E.

The File management training module was delivered. The instructor introduced the revised outline clarifying the steps to be used in file creation. The trainees had more hands-on experience and could follow the program's screens without having to flip in and out of Help. Some problems with the computer network resulted in the instructor working from the middle of the room instead of using the demonstration devices available. Demonstrating the concepts was limited. The instructor slowed down to allow everyone more time to follow the verbal instructions. A post test was developed to measure that the instructional goal was achieved. It consists of field names to

be used in creating a file. The trainee would design a form using these field names, save the file and add data to the file. A performance checklist was to be used by the instructor to measure the trainee's performance. The post test and checklist may be found in Appendix F.

A course evaluation questionnaire was distributed to measure the trainee's feelings about the training. It consisted of 14 questions. The questionnaire asks about the instructor, materials, and instructional activities. It also asks whether the trainee would take an advanced course in this software and how the information learned would be used. The questionnaire may be found in Appendix G. The feedback from the trainees was that too much information was being covered and not enough time was being allowed. Also the instructor observed the disparity in previous use of computers. The requirement that the attendees first have a DOS class was to be enforced.

Summative Evaluation

Kirkpatrick's framework as presented by Phillips, (1987) for classifying areas of evaluation covers four levels of evaluation.

Reaction

The first level, reaction, defines what the trainees think of the program. This evaluation covers materials, instructors, facilities, methods used, and course content.

The instructor used a course evaluation questionnaire to elicit this information for the formative evaluation as well as

implementation. The results of the survey are summarized in Table 5.

Table 5

Summary of Results for All Three Groups

1) Did the instructor cover the subject?

0 No 5 Some of it 25 Completely 4 Too much

2) How was the presentation?

1 Too much lecture 1 Too much computer 29 Enough of both

3 Too little lecture 0 Too little computer

3) Rate the instructor on the following:

	Excellent	Good	Fair	Poor	N/A
a. Statement of objectives	19	15	2	1	1
b. Knowledge of subject	33	3	0	0	1
c. Presentation materials	23	11	2	0	1
d. Answers questions	28	5	2	1	1
e. Is understandable	23	11	0	1	1
f. Summarizes	18	16	1	0	1

The survey was taken by three groups of trainees. Each group started with 16 trainees. The total number of people completing the training was 37. These groups were made up of managers, clerical staff and administrators. One participant came to only two sessions, therefore, she felt the survey did not apply to her. The three individual tables of survey results are in Appendix G.

Five open ended questions were asked. The open ended

question is used to give the participant a chance to express needs, expectations and information about himself. A summary of trainee comments follows:

Question 1: How would you improve the course?

Smaller classes; hard disk system instead of floppy disk system; divide course into smaller units; more sessions; more practice time; better equipment; slow down; more review; separate beginners from novices

Question 2: What did you like best about the course?

Hands-on experience; feeling at ease; understandable instruction; time for questions; one computer per person; handouts; presentation

Question 3: What did you like least?

Unreliable equipment; no time for in depth coverage of topics; not enough practice time; moved too fast; too many class questions; not homogeneous; too short; macros

Question 4: How will you use the information you learned in this course?

Word processing; databases; to maintain records on the job; curriculum development; mailing lists; memos; reports; improved computer skills; labels

Question 5: Would you take the next course in the series?

Yes -- 29 No -- 2 Unable for various reasons -- 6

Learning

The second level of evaluation is learning. It is concerned with measuring the learning of facts, principles, techniques, and

skills presented in a training program. The measures should be quantifiable and objective. For this training program measuring learning performance involved the use of two entry behavior tests and a performance checklist.

Twenty-five trainees took the entry test for matching keyboard functions. The trainees were expected to do well so instruction could continue. The test followed classroom instruction and was "open book." After instruction a checklist was used to observe each trainee doing the file creation exercise. The results of the checklist for the three groups follows:

Of the 41 trainees who started training, 37 remained at the end of the three training sessions. Tables 6 and 7 list the problems each group had doing the post test. Evaluation was conducted by instructor observation using the 17 items on the checklist. The same problems generally occurred in the pilot test group and the implementation group due to the nature of the program and concepts to be explained. The results are in Appendix F.

Behavior

Kirkpatrick's third level, behavior, refers to the measurement of job performance. A follow-up was done by the instructor for participants who requested assistance in designing their files at their work stations. Members of departments who were sent for training asked for additional assistance. The

Table 6

Problems Identified in Small Group and Pilot Test

Item on checklist	Problem
5	using field label
6	identifies field delimiters
7	mistyping colon and semi-colon
8	when to use <
9	when to use >
13	identifies format spec
14	select information type
15	select additional information types
16	use of tab key between global format options
17	information on date options

Table 7

Problems Identified in Implementation

Item on checklist	Problem
7	mistyping colon and semicolon
9	when to use >
13	identify format spec
14	select information type
15	select additional information types
17	information on date options

departments that received follow-up services include Health Services to set up a log for entry of injuries on campus; Registrar to set up an Albany counts log for student enrollment; Admissions to set up a database for new applicants; Dean of Instruction to set up a tracking database for students in the Basic Education program when they transfer to other departments; Academic Program Study to set up statistical analysis for various programs; and Communications to set up tracking of WHPC (90.3 FM) recordings.

The transferral of learning to others in the office is an indicator of behavioral modification and accomplishment of the affective objectives. These people shared what they learned.

Results

The last level of evaluation, results, is used to relate the results of the program to organizational improvement. NCC is a non-profit service organization. Results will not generate a financial impact but will improve operations. Some of the benefits to NCC are evident: (1) in the increased use of mail merges on inter-office mail because files have been designed to hold information that can be selected for specialized mailings, (2) listings that are updated periodically are done within minutes using FILE, (3) fast maintenance of personnel records, and (4) easier tracking of purchase requisitions.

Learning Transfer

To insure transfer of learning from the classroom to the job, the instructor built in methods suggested by Beaudin (1987) into the instructional design. Beaudin lists three steps which can be taken to enhance the transfer of learning. The steps should be taken before, during, and after training.

Before strategies

Training should be relevant to the needs, work environment and motivation of the trainees. Cooperation of supervisors and management and a commitment to project support should be agreed on to insure learning transfer. The designer provided examples

of what Q & A could produce as a result of training for department members. Scheduling was arranged and cooperation of the department heads was secured to ensure attendance by participants.

During strategies

The objectives of the course should be recognized by the trainees and management. Allowing learners to participate and practice in the learning helps learners to apply their new skills to their jobs. Positive feedback encourages learners to use skills. The designer provided feedback to each trainee as they worked at their stations during training sessions. Suggestions were made and discussed as they designed the file for the class exercise.

After strategies

Provision for follow-up after learners leave the course reinforces positive transfer. Use of a "buddy system" with co-workers also encourages positive transfer. After the small group trial the designer allowed more than one department member to attend the course at the same time. This strategy allowed them to help each other on returning to the office.

The designer develops an atmosphere for positive transfer of learning by asking learners to use examples of work from their jobs to meet the course objectives. The participants were asked to bring a sample of a list that was related to the job and could be transferred to FILE. Taking their files back to the office to use is a positive transfer of learning.

Summary

Materials prepared by the instructor were delivered at one small group trial, a pilot test, and during implementation. Questionnaires were given to the trainees at all the field trials to gather information and get their reactions. A post test was given in addition to the questionnaires and a performance checklist was used to evaluate learning. The four levels of Kirkpatrick's evaluation were used by the instructor.

The trainees reached different levels of comfort with this program. Ongoing use of the training will be part of the follow-up procedure for all trainees.

CHAPTER SEVEN

SUMMARY AND RECOMMENDATIONS

Introduction

In this chapter, the designer summarizes the content of the project. She reviews the development and delivery of a training program for the administration, staff and faculty members at Nassau Community College. The training was in the use of the software program called Q & A. The project reviews the steps followed by the designer and concludes with recommendations for those who may wish to build upon this project.

Methods and Procedures Used

The method used in this thesis/project was based on the Interservice Procedures for Instructional Systems Development model. It was developed in 1976 at Florida State University. The design process has five components: analysis, design, development, implementation, and evaluation.

Analysis

The designer analyzed the need for training based on observation of the staff members at their work stations. She also was part of a committee that did a survey of computers available at NCC. The computers could be used by staff members to do a familiar task better or more efficiently, to make better use of time thereby avoiding overtime and to give the staff member a sense of satisfaction while using a new technology that upgrades the staff members job skills. Also, a data

questionnaire was given to the trainees to determine what they thought they needed, not what the organization needed. Training NCC staff members to use Q & A on a personal computer was a means of satisfying these needs.

Design

The training design was predicated on the task analysis and the learning objectives based on the staff members' needs. The appropriate domains of learning were identified as intellectual and affective. The steps required to perform the instructional goal were sequenced based on the Q & A program's design. Entry behaviors were defined for the trainees to move to learning the FILE after the word processor. Entry behavior tests were designed to ascertain keyboarding skills. The learning activities followed the program's screens. The training was to take 3 and a half hours in two two-hour periods. Lecture, discussion and guided hands-on practice were the methods used for delivery of the training plan.

Two questionnaires were prepared. The first one determined the participant's background and reasons for attending the course. The second questionnaire was for course evaluation. A checklist was designed to accompany a post test to measure student learning.

Development

Learning activities for the training plan were based on Gagnes' nine instructional events. An outline was developed to follow the instructional strategy. The media developed included

handouts to be used as exercises, a dryboard for notes, and computers loaded with the Q & A software. These media were used in conjunction with lecture/discussion and guided practice. Tests were developed for entry behaviors and as a post test. A checklist to observe what learning was taking place was used with the post test. Questionnaires to gather information before and after the training were also developed.

Implementation

The course was implemented from March to April 1989. Each session lasted two hours over a seven week period. The target group was made up of staff and faculty members. The group members had different computer backgrounds coming into the course.

Evaluation

Evaluation was done using a small group and a pilot test group. The formative evaluation resulted in the materials developed for the training being shortened following the small group trial. As a result of this tryout the course time was increased by two hours to cover seven weeks.

The summative evaluation measured all four of Kirkpatrick's levels. Reaction was measured through a questionnaire. Learning was measured by a post test and checklist combination. Behavior changes were measured by the use made of the FILE on the job. And last, results were measured by the benefits transferred to NCC offices by personnel using FILE to do their jobs more effectively.

Conclusions

A positive attitude and humor on the part of the instructor helps avoid pitfalls and problems caused by hardware and software failures. Problems encountered during the small group and pilot test involved use of the computer hardware and not enough time to cover the material. These are problems that may be easily solved as indicated in the section on recommendations.

Gaining the cooperation of the group is the first step in accomplishing the instructional goal. Participants who do not want to be in the course may create blocks to learning. Self-interest is an excellent motivator to gain cooperation.

Recommendations

1. Send questionnaire to prospective trainees when soliciting class participation to help in analyzing the trainee's needs.
2. Break the course into two four or five week segments. This will allow time to slow down the amount of material covered in the course. The second five week period should cover the file management module with the report generation functions and intelligent assistant report functions. The first four week word processing segment should be followed by a two week break to give trainees a chance to use what they learned, become familiar with the keyboard and commands, and

feel comfortable using the word processor before starting to learn database concepts and file creation.

3. Decisions to use floppy disks to run the program software or a network must be made early in course development. Whichever method is chosen make sure the computer system works with that method. Time may be lost and frustration can change the class atmosphere if problems occur during training because of hardware failures.

4. Materials that are now available, but were not available at the time this project was developed, for supplemental review and/or introduction of Q & A can be used as part of the hands-on classroom course. For example:

   a. Q & A Videocassette Training--Quick Results with Q & A, Video Guides, Box 750, Bristol, RI 02809 Price: $59.95.

   This is a video package that covers the basic functions in Q & A. It does not use a step through approach for hands-on progress. It may serve as an introduction to the software package but cannot be used without training.

   b. The Q & A 3.0 Training Guide--Symantec Corporation, 10201 Torre Avenue, Cupertino, CA

   The Guide includes a 100-page workbook and data disk. It contains exercises using the six modules in Q & A. Topics covered include file design, sorting and printing reports, mail merge and mailing labels, creating macro applications, and importing data from other software packages. The

purchase price for this training guide is $49.95. The designer would recommend using the guide as a self-learning package for reinforcement of the training she provides.

5. Plan a review session two months after the training program to help refresh what participants learned. This also serves to let the trainees know they are not being abandoned. Have them write down questions to bring to the follow-up session.

Concluding Statement

Training staff members in Q & A can be successful and the learning transferred to the office as a result of this course. Course participants have asked for follow-up instruction as they use the new skills acquired during the course. As a result of these requests from NCC computer users this training program has become an ongoing program. It is offered each semester for in-service training of personnel.

The instructional materials developed for this project will be extended to the other modules of Q & A. The instructional system design model will be used for future development of other training projects to be designed by this trainer.

As adults, the staff members are making a choice to enhance their skills for the future.

> To paraphrase Knowles (1973) during periods of readjustment leading up to and following life events, such as marriage, birth, death, etc., circumstances often give rise to strategic 'choice points' in life

direction and often compel adults to make an 'agonizing reappraisal' of their circumstances and the prospect confronting them in years ahead. It is in such periods that some of the most meaningful learning may occur, when an older dog may learn some tricks better than younger dogs who have yet to be confronted with some of the critical events of life. p. 161

Appendix A

College and Staff Members Needs Surveys

NASSAU COMMUNITY COLLEGE

Micro Computer Summary
August 1988

	INSTALLED SYSTEMS			SYSTEMS ON ORDER		
	Admin.	Acad.	Total	Admin.	Acad.	Total
COMPUTERS						
Apple IIc	0	4	4	0	0	0
Apple IIe	0	125	125	0	0	0
Apple II+	0	17	17	0	0	0
Apple	0	46	46	0	0	0
Apple MAC	0	2	2	0	1	1
Apple MAC+	0	1	1	0	0	0
Apple MAC SE	1	0	1	0	0	0
Bondwell XT	0	1	1	0	0	0
Commodore Amiga	0	4	4	0	21	21
Commodore 64	0	7	7	0	0	0
Commodore 128	0	1	1	0	0	0
Epson Portable	0	1	1	0	0	0
Exxon WP	13	28	41	0	0	0
Fountain XT	0	14	14	0	1	1
HP 86B	0	1	1	0	0	0
IBM PC/AT	26	5	31	0	1	1
IBM PC/XT	5	8	13	0	2	2
IBM PC/XT 286	0	11	11	0	0	0
IBM PC	17	90	107	0	0	0
IBM PS/2-80	1	1	2	0	1	1
IBM PS/2-80 Compat	0	0	0	0	1	1
IBM PS/2-60	16	9	25	0	0	0
IBM PS/2-50	2	5	7	8	3	11
IBM PS/2-50Z	1	1	2	1	0	1
IBM PS/2-30	10	22	32	1	13	14
IBM DWrite	3	0	3	0	0	0
IBM PC Portable	0	2	2	0	0	0
Laser 128	0	1	1	0	0	0
Philips	17	6	23	0	0	0
Samsung XT	0	4	4	0	0	0
TRS 80	0	1	1	0	0	0
Wang WP	0	11	11	0	0	0
Wyse IPM Compat.	2	0	2	0	0	0
Zenith Portable	0	1	1	3	2	5
Totals	114	430	544	13	46	59

DATA COLLECTION QUESTIONNAIRE

INSTRUCTION: Please circle or fill in your response.

1. Do you use a Personal Computer?
   a. at work
   b. at home
2. Did you take the DOS course offered by MIS or any DOS course?

   YES NO
3. Do you use a Personal Computer for:
   a. word processing
   b. file management (databases)
   c. spreadsheets (budgets, finances, etc)
   d. graphics
      1. newsletters
      2. posters and signs
      3. greeting cards, banners
      4. drawing (cartoons, entertainment)
   e. games
4. Have you used a computer keyboard?

   Mainframe or Personal Computer or Both
5. What is your job title?
6. What department do you work in?
7. List any special interests you have or hobbies.
8. List any clubs or organizations.
9. What would you like this course to cover?

Appendix B

Job Task Description

Job Title and Description

Occupational analysis for the following job title:

Secretarial Staff

The job is located in the administrative or academic office for which you apply at Nassau Community College.

A secretary's job functions will include clerical duties for one department head, or if you're in an academic office for the department head and the department faculty members. The general duties will include typing correspondence and memorandums, tracking schedules of faculty members, answering telephones, filing, word processing, handling mail, ordering supplies and equipment, handling time sheets, making travel arrangements and greeting visitors.

Possible contingent responsibilities may include contact with and helping students in the academic departments or some administrative offices such as Admissions, Registrar or Student Finance. Also, training student aides to help with your work as part of the work experience programs required by some departments. You may also have to accompany your department head to meetings if notes are taken at the meeting.

Simply stated job tasks include:

1. uses a word processor
2. answers telephones and takes messages

3. types memos and correspondence
4. types purchase orders and forms
5. files copies for documentation and tracking
6. sorts and distributes mail
7. orders supplies
8. uses a copy machine
9. greets people and helps students
10. uses a computer -- new task not listed in original job description

Appendix C

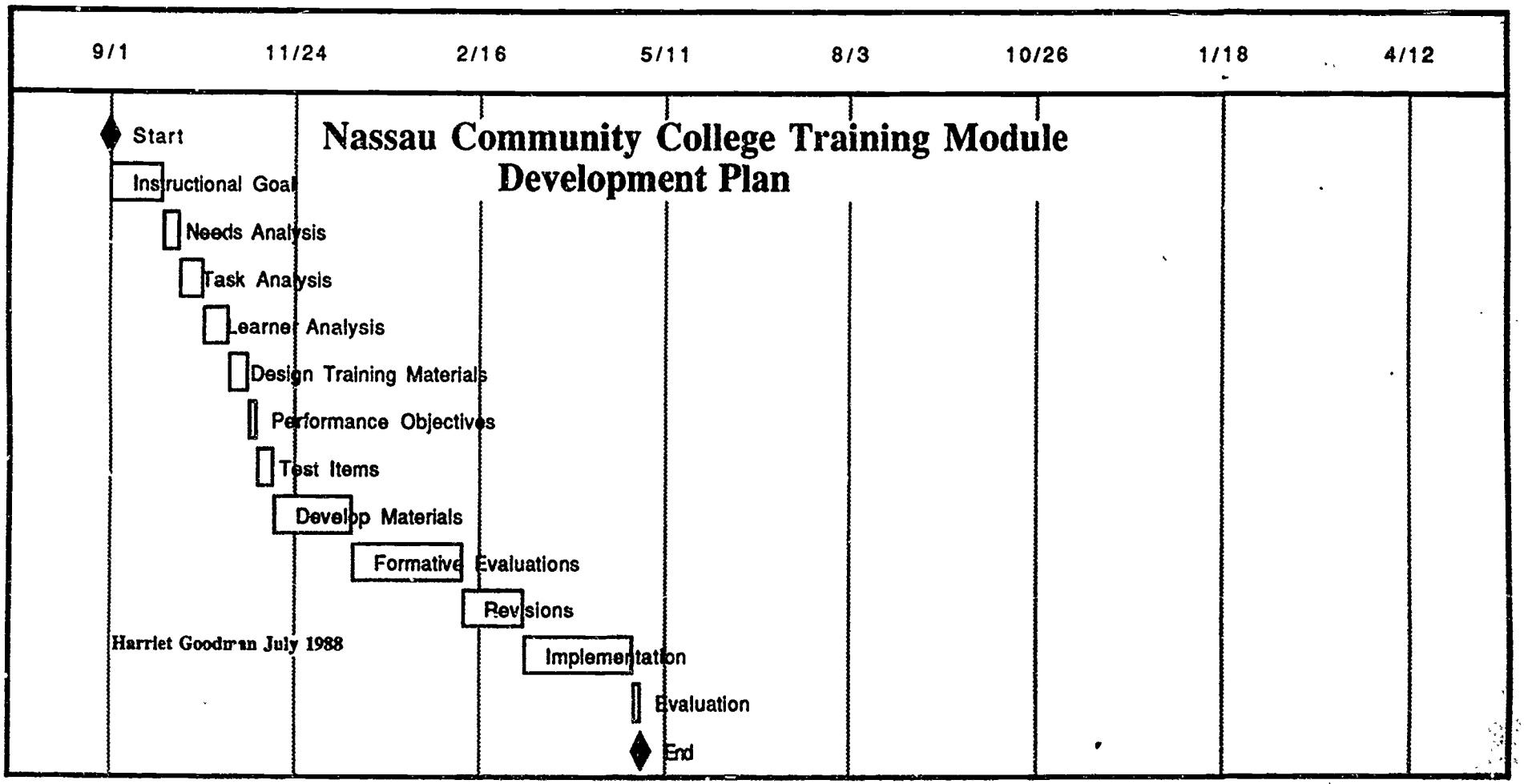
Project Plan

NASSAU COMMUNITY COLLEGE

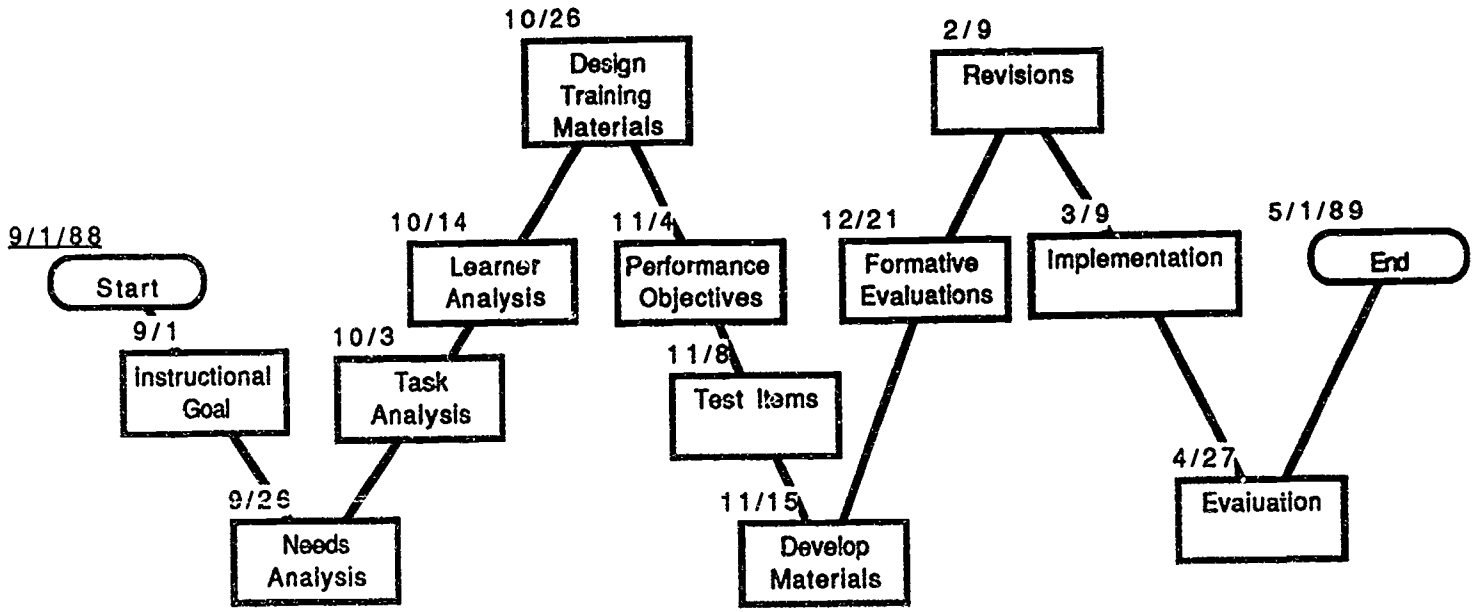
DATABASE TRAINING MODULE

MAJOR EVENTS LIST

1. Instructional goal
2. Needs analysis
3. Task analysis
4. Learner analysis
5. Design training materials
6. Performance Objectives
7. Test Items
8. Develop materials
9. Formative evaluation and revisions
10. Implementation
11. Summative evaluation


9/1
11/24
2/16
5/11
8/3
10/26
1/18
4/12
Start
Nassau Community College Training Module
Development Plan
Instructional Goal
Needs Analysis
Task Analysis
Learner Analysis
Design Training Materials
Performance Objectives
Test Items
Develop Materials
Formative Evaluations
Revisions
Harriet Goodman July 1988
Implementation
Evaluation
End

Nassau Community College Training Module Development Plan



Harriet Goodman July 1988

Appendix D

Performance Objectives

PERFORMANCE OBJECTIVES

The performance objectives are based on the task analysis.

TASK 01 -- Design a File

1. Given the program Q & A the student designs a file (database). The file contains data that can be retrieved and used for reports.

1.1 Given the program Q & A the student chooses File from the main menu. She/he creates a new file.

1.2 Given the program Q & A the student chooses Design a file from the File menu. She/he designs a new file.

1.3 Given the program Q & A the student chooses Design a New File from the Design menu. She/he designs a new file to hold information.

TASK 02 -- Create a form

2. Given the program Q & A the student creates a form. The form stores information in a new file.

2.1 Given the program Q & A the student selects Q&A's rules to create the form. She/he creates a new file.

2.2 Given the program Q & A the student types a field label. The field label identifies the type of data to be entered in the information blank.

2.3 Given the program Q & A the student defines field lengths. Field lengths are defined by identifying field delimiters.

2.3.a Given the File form the student begins a field. The student will use a colon (:).

2.3.b Given the File form the student begins a rectangular field. The student will use a less than (<) symbol.

2.3.c Given the File form the student ends a field. The student will use a greater than (>) symbol if the student has not met another field name or an end of line.

2.3.d Given the File form the student chooses single or multiple fields per line. The number of fields per line are limited by the margins set for the form.

2.4 Given the File form in the program Q & A the student names the limitations allowed in designing the form. The student

writes them down in a notebook. The student applies these limitations when designing the File form.

2.4.a Given the File form in the program Q & A the student states the screen limitations. The limitation is 21 lines per screen.

2.4. Given the File form in the program Q & A the student states the form limitations. The limitation is 10 screens per form.

TASK 03 -- Assign information types to the fields in the File form

3.1 Given the File form in Q&A the student identifies the Format Spec screen. The Format Spec indicator appears on the status line.

3.2 Given the Format Spec in the File form the student selects the information type. The information type includes date, money, numeric, text, logical fields or keyword types.

3.3 Given the Format Spec in the File form the student types additional format codes. Additional format codes include uppercase and justification within fields.

TASK 04 -- Choose global format options

4.1 Given the Global Format Option screen the student moves the tab key between the options available in Q & A.

4.2 Given the Global Format Option screen the student chooses the options that will represent how the information will be viewed on the screen. The options selected are based on the recognition by the viewer of the information in standard form (e.g. $130.40 for a money field).

TASK --

In the affective domain of learning the student given the choice of using a database in Q & A as part of the work situation chooses to use it to store and retrieve information. The student uses the information to produce reports, to use mail merges for letters or memorandums, or to produce mailing labels or labels for office use. The student chooses to use the File function each time a list can be used for more than one purpose.

PERFORMANCE OBJECTIVES FOR SUBORDINATE TASKS FOR DESIGNING A FILE

TASK 01 -- Use a computer

1. Given a computer the student chooses to use it. The computer helps the student to be more effective in his/her work.

1.1 Given a computer and manuals the student identifies the on/off switch. Pressing the on/off switch turns the computer on or off.

1.2 Given a computer the student selects the application program Q & A. The student uses Q&A when a database is required.

TASK 02 -- Use the keyboard

2. Given a computer the student uses the keyboard layout to produce files and documents. The student uses the correct keys to produce written materials.

2.1 Given a computer the student locates the numeric keypad. The numeric keypad is on the right side of the keyboard.

2.2 Given a computer the student locates the alpha keypad. The alpha keypad is in the center of the keyboard.

2.3 Given a computer the student locates the function keys (F1-F12). The function keys are at the top or the right side of the keyboard.

2.4 Given a computer and a keyboard layout the student locates the special keys (Ctrl, Alt, Ins., Del., Scroll lock, Num lock, Prt Scrn, Pause, Enter, Esc., etc.). These keys are in several places on the keyboard.

TASK 03 -- Demonstrate the functions of the special keys

3. Given a computer the student demonstrates that the special keys affect capitalization, selects numbers on the numeric keypad as part of a calculator, and acts as directional movement for the cursor, etc.

3.1 Given a computer the student selects a special key to use in combination with another key to execute a command such as Alt and F5 to move text. The student's completion of the command indicates the performance.

TASK 04 -- Demonstrate how to use the basic functions of the word processor in Q & A.

4.1 Given a computer and Q & A the student uses the word processor. The student produces a finished document.

4.2 Given a computer and Q & A the student uses the functions to enhance document. The enhancements include bold, italics, underline, superscript, subscript, fonts, etc.

4.3 Given a computer and Q & A the student relates the basic functions of the word processor to the File management function. The basic functions include enhancing text, defining pages, printing, etc.

In the AFFECTIVE DOMAIN OF LEARNING the student will:

TASK 01 -- Choose to extend the training to use the file management module of Q & A.

1. Given a computer and Q & A the student chooses to extend the training to use the file management module of Q & A. The files are used to store information.

1.1 Given the program Q & A the student justifies learning file management to do a more effective job. She/he uses computers instead of typewriters.

1.2 Given the program Q & A the student discusses file management concepts and uses with the group. The student produces reports and retrieve data.

TASK 02 -- Practice using the file management module

2. Given a computer and Q & A the student practices using the file management module. She/he creates files for different purposes.

2.1 Given a computer and Q & A the student initiates a file for use in the job. The student will use the file to produce reports or retrieve data according to department needs.

2.2 Given a computer and Q & A the student completes and tests the file. The file is tested in an actual work situation.

2.3 Given a computer and Q & A the student shares the file with other employees in the department. The work is shared and others use the file to do their jobs more effectively depending on the department's policy.

2.4 Given a computer and Q & A the student proposes other uses for files. These files can include inventories, phone directories, and personnel data. The student may develop as many ideas as she/he thinks of.

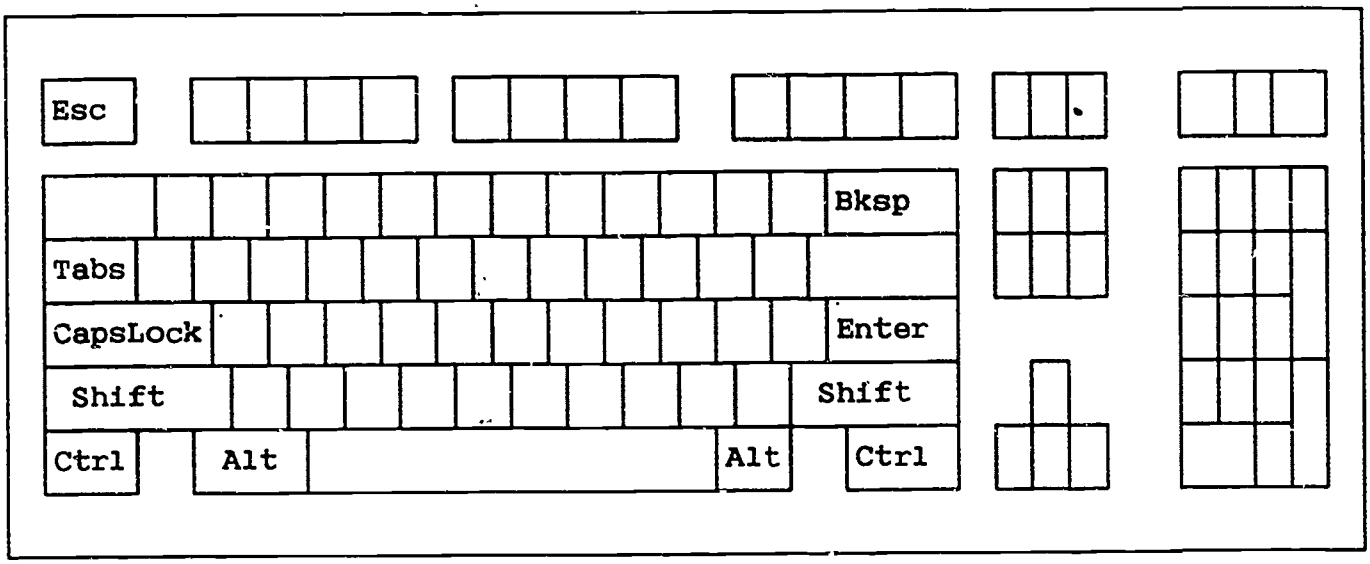
Appendix E

Entry Behavior Tests
and
Review Sheet

TEST 1

Test for Entry Behaviors

Cognitive skills -- recognition of keyboard
Each question is worth 10 points.
Follow the instructions below the keyboard.



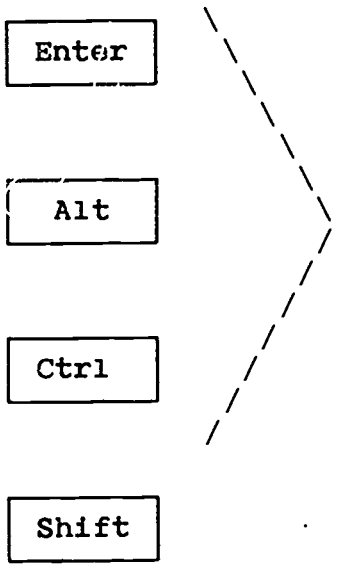
1. Circle the numeric keypad.
2. Put a square around the alphabetic keypad.
3. Put a double line through the function keys.
4. Put a X on the keys that work in combination with other letter or numbers.
5. Which key turns the number keypad on?
6. Which keys take you to the top of page? bottom of page?
7. Which keys allow you to move through text without erasing text?
8. To print what you see on your screen press _____ _____.
9. To add text where you need it press the _____ key.
10. To remove text press the _____ key.

Review Sheet for Test 2 .

Review for Entry Behaviors

REVIEW OF FUNCTION KEYS AS THEY ARE USED IN Q & A

THE FUNCTION KEYS shown on the diagram below are used by Q & A to perform specific functions in the word processor. They are used in combination with the Ctrl, Alt and Shift keys.



THESE KEYS ARE USED WITH OTHER KEYS TO PERFORM SPECIAL FUNCTIONS.

SHIFT KEY IS THE SAME AS A TYPEWRITER. YOU MUST SHIFT FOR CHARACTERS ON TOP OF KEY, EVEN WHEN YOU HAVE THE "CAP LOCK" ON. THIS IS DIFFERENT FROM THE TYPEWRITER.

LET'S USE THE FUNCTION KEY COMBINATIONS ON THE NEXT PAGE.

FUNCTION KEYS USED COMBINATIONS IN Q & A.

F1

USED WITH	CTRL	F1	Checks spelling (word)
USED WITH	SHIFT	F1	Checks spelling (document)
USED ALONE		F1	Information

F2

USED WITH	CTRL	F2	Print text block
USED WITH	SHIFT	F2	Use macros
USED ALONE		F2	Print document

F3

USED ALONE		F3	Deletes a block of text
USED WITH	CTRL	F3	Document statistics

F4

USED WITH	CTRL	F4	Delete to end of line
USED WITH	SHIFT	F4	Delete line
USED ALONE		F4	Delete word

F5

USED WITH	ALT	F5	Move a block to a file
USED WITH	SHIFT	F5	Move block within a document
USED WITH	CTRL	F5	Copy block to a file
USED ALONE		F5	Copy a block within a document

F6			
USED WITH	ALT	F6	Hyphenate
USED WITH	CTRL	F6	Defines the page
USED WITH	SHIFT	F6	Enhances text (bold, italics)
USED ALONE		F6	Set temporary margins (indent)
F7			
USED WITH	ALT	F7	List fields
USED WITH	CTRL	F7	Go to page/line of a document
USED WITH	SHIFT	F7	Restore deleted text
USED ALONE		F7	Search and replace
F8			
USED WITH	CTRL	F8	Export document
USED WITH	SHIFT	F8	SAVE DOCUMENT TO DISK
USED ALONE		F8	Options menu
F9			
USED WITH	ALT	F9	Calculate
USED WITH	CTRL	F9	Make font assignments
USED WITH	SHIFT	F9	Scroll screen down
USED ALONE		F9	Scroll screen up

F10 IS THE CONTINUE, ENTER, RETURN , EXECUTE KEY
IN OTHER WORDS, DO WHAT I TOLD YOU TO DO!

TEST 3

Test for entry behaviors

Cognitive skills -- recall and matching
This test can be broken into two sections.

MATCH THE FUNCTION AND SPECIAL KEYS TO THEIR USES IN Q & A.
Each match is worth 5 points.

1. _____	F10	A.	Cancel
2. _____	F4	B.	Get options
3. _____	Shift F6	C.	Print screen image
4. _____	F5	D.	Help screen
5. _____	F1	E.	Delete word
6. _____	Shift Prt Scrn	F.	Spell check
7. _____	Shift F1	G.	Enhancements
8. _____	F8	H.	Print document
9. _____	F2	I.	Execute a command
10. _____	ESC	J.	Copy function
11. _____	Ctrl F3	K.	Takes you to end of file
12. _____	Ctrl F6	L.	Top of page
13. _____	F7	M.	Let's you add text
14. _____	Shift F8	N.	Set temporary margins
15. _____	Home	O.	Let's you remove text
16. _____	Insert	P.	Search & replace
17. _____	End	Q.	Go to
18. _____	Delete	R.	Document statistics
19. _____	F6	S.	Define page
20. _____	Ctrl F7	T.	Save document

Appendix F

Post Test and Performance Checklist

PERFORMANCE POST TEST

A. CREATE A FILE to store the following information for your database:

1. First name
2. Last name
3. Location
   Line 1
4. City
5. State
6. Zip Code
7. Salary
8. Department
9. Telephone no.
10. Extension
11. Sex
12. Date Hired

B. SAVE the File you created.

C. ADD the following data to your File:

USE THE FOLLOWING INFORMATION FOR YOUR FILE:

Harry Brown
32 First Street
Mineola, NY 11501
Media, 516 234-4567, x7412, $26,345.00,

George Green
23 Second Street
Garden City, NY 11530
Art, 516 345-8765, x7227, $23,987.00

Sid Black
156 Third Street
Valley Stream, NY 11580
Human Resources, 516 987-2341, $76,234.00

Karen Blue
98 Fourth Avenue
Rockville Center, NY 11582
Procurement, 516 123-6543, x 7429, $34,234.00

Sally White
P.O. Box 1789
Flushing, NY 11365
Media, 516 768-3434, x 7423, $35,876.00

John White
469 Fifth Street
Hempstead, NY 11550
Procurement, 516 679-5678, x7824, $32,213.00

April White
987 Sixth Street
Garden City, NY 11530
Art, 516 345-5678, x 7645, $34,124.00

PERFORMANCE CHECKLIST:

CRITERIA

1. The file contains usable data.
2. Designs a new file from file menu.
3. Designs a new file from Design a new file.
4. Uses rules to create file.
5. Uses field label.
6. Identifies field delimiters.
7. Uses a colon.
8. Uses a <.
9. Uses a >.
10. Chooses single or multiple fields.
11. States 21 lines per screen.
12. States 10 screens per record.
13. Identifies format spec.
14. Selects information type.
15. Selects additional information types.
16. Moves tab key between Global Format Options.
17. Chooses options to represent how information is viewed on the screen.

Number of Incorrect Responses on Post Test Checklist Small Group

17 Objectives

Learner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1					x			x	x				x	x	x	x	x
2													x	x	x		
3						x	x	x	x				x	x	x		x
4																	
5					x	x	x		x	x			x	x	x		x
6							x		x				x	x	x		
7					x		x		x				x	x	x		
8					x	x			x				x	x	x		x
9									x				x	x	x		
10						x	x		x				x	x	x		
11																	
12																	
Total incorrect					4	4	5	2	8	1			9	9	9	1	4

Number of Incorrect Responses on Post Test Checklist Pilot Test

17 Objectives

Learner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1													x	x	x		
2							x						x		x		
3													x	x			x
4						x	x	x					x	x			
5													x	x			
6									x				x				
7							x						x				
8													x	x		x	x
9					x	x		x	x				x	x			
10									x				x				
11					x								x	x	x		
12																	
Total incorrect					2	2	3	2	3				11	7	3	1	2

Number of Incorrect Responses on Post Test Checklist Implementation

17 Objectives

Learner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1													x	x	x		
2							x		x				x	x			
3													x	x			x
4													x				
5									x				x	x			
6													x	x			x
7							x						x	x			x
8							x		x				x	x			
9													x	x			
10													x		x		
11							x										
12																	
13																	
14																	
Total incorrect							4		3				10	8	2		3

Appendix G

Course Evaluation Questionnaire

COURSE EVALUATION:

DATA QUESTIONNAIRE

Instructor_____Course_____

Date_____

1. Did the instructor cover the subject?

__No __Some of it __Completely __Too much

2. How was the presentation?

__Too much lecture __Too much computer __Enough of both
__Too little lecture __ Too little computer

3. Rate the instructor on the following:

	Excellent	Good	Fair	Poor
a.Statement of objectives				
b.Knowledge of subject				
c.Presentation materials				
d.Answers questions				
e.Is understandable				
f.Summarizes				

How would you improve the course?

What did you like best about the course?

What did you like least about the course?

How will you use the information learned in the course?

Would you take the next course in this series?

Results of Survey: Small Group

The survey was taken by three groups of trainees. Each group started with 16 trainees. The small group trial had 12 trainees at the end of the training session. The group was made up of administrators and managers.

The results were as follows:

1. Did the instructor cover the subject?

   0 No 1 Some of it 7 Completely 3 Too much

2. How was the presentation?

   0 Too much lecture 0 Too much computer 7 Enough of both

   2 Too little lecture 0 Too little computer

3. Rate the instructor on the following:

	Excellent	Good	Fair	Poor	N/A
a.Statement of objectives	5	5	1	0	1
b.Knowledge of subject	9	2	0	0	1
c.Presentation materials	5	5	1	0	1
d.Answers questions	8	1	1	1	1
e.Is understandable	7	3	0	1	1
f.Summarizes	4	6	1	0	1

Written Comments to questions:

1. Small class size, hard disk system instead of dual floppies, break course into smaller units, more sessions, more practice time, more individual help

2. hands-on, feeling at ease, understandable instructor, time for questions, one computer per person

3. unreliable equipment, no time for in depth coverage of topics, moved to fast, not enough practice time

4. to maintain records, curriculum development, word processing, mailing lists, memos, databases, reports, improved computer skills

Results of Survey: Pilot Test

The survey was taken by three groups of trainees. Each group started with 16 trainees. The second group had 14 trainees at the end of the session. The group was made up of clerical workers, administrators and faculty.

The results were as follows:

1. Did the instructor cover the subject?

   0 No 2 Some of it 11 Completely 1 Too much

2. How was the presentation?

   2 Too much lecture 1 Too much computer 12 Enough of both

   0 Too little lecture 0 Too little computer

3. Rate the instructor on the following:

	Excellent	Good	Fair	Poor
a.Statement of objectives	8	5	1	0
b.Knowledge of subject	13	1	0	0
c.Presentation materials	9	4	1	0
d.Answers questions	11	2	1	0
e.Is understandable	8	5	0	0
f.Summarizes	6	7	0	0

Written Comments:

1. practice lab time, eliminate equipment problems, easier instructions, slow down, more review, more sessions, offered more often

2. hands-on, asking questions, relaxed atmosphere

3. not enough practice time, too rushed, too many class questions

4. BEP tracking students, set up files and reports, word processing, labels, databases

Results of Survey: Implementation

The survey was taken by three groups of trainees. Each group started with 16 trainees. At the end of the training session eleven trainees remained. The group was made up of clerical workers, administrators and faculty.

The results were as follows:

1. Did the instructor cover the subject?

   0 No 2 Some of it 7 Completely 0 Too much

2. How was the presentation?

   0 Too much lecture 1 Too much computer 10 Enough of both

   1 Too little lecture 1 Too little computer

3. Rate the instructor on the following:

	Excellent	Good	Fair	Poor
a.Statement of objectives	6	5	0	0
b.Knowledge of subject	11	0	0	0
c.Presentation materials	9	2	0	0
d.Answers questions	9	2	0	0
e.Is understandable	8	3	0	0
f.Summarizes	8	3	0	0

Written Comments:

1. more lab time, more sessions, separate beginners from novices

2. presentation, handouts, valuable information, ease of operation, hands-on, lecture

3. not homogeneous, more frequent sessions, too short, equipment problems

4. databases, correspondence, labels, improve work performance, should require prerequisite

Appendix H

First Instructional Material Set

Q & A -- FILE -- OUTLINE

The File module lets you organize and store information on forms you create to hold information you need.

You would start by designing a form, and then adding information to each form After the file has information in it you can look at it, change it or generate reports from it.

1. LOOK AT SAMPLE FILE

2. EXPLAIN TERMS

a. LABEL - what kind of information should go in the information blank

b. FIELD - label plus information in it

c. VALUE (or information blank) - what you type in the field

d. RECORD - a filled out form

e. DATABASE - collection of filled out forms with same design and under the same file name

f. FORM LENGTH -LIMITATIONS OF FILE - 10 SCREENS OF 21 LINES EACH SCREEN

B. PROCEDURE

1. MAIN MENU- F

2. FILE MENU -CHOOSE WHAT YOU WANT TO DO

3. DESIGN MENU - CHOOSE
   YOU MUST GIVE A FILE A NAME AT THE BEGINNING
   B:\
   EXPLAIN FILE NAME EXTENSION - DTF

4. NEW MENU

C. EXC10 - WE are designing a phone list

Look at key assignment line
REVIEW

STOP AND THINK - about what you want to include in a file:

1. meaningful labels - no abbreviations
2. flexible information - enough fields to include everything

3. layout - eye appealing -- use boxes for ease of finding information
4. what information to include

F1 - GLANCE THROUGH HELP

D. THREE PARTS TO DESIGNING A FORM:

1. Layout fields,
   Create identification labels *
   Allocate space
2. Assign information types to each field
3. Choose global format options

E. TO LAYOUT THE FORM

1. Place cursor where you want a field name

2. Type the label followed by a colon :
   Colon begins a field and continues to edge of screen
   or beginning of next field
   OR type a < if you want the left edge of your field
   to be justified (this says start here and
   line up all lines at this space)

3. PLACE the cursor where you want the field to end and enter a >

   The ANGLE BRACKETS limit the number of characters that fit in an information blank

4. Boxes can be drawn around ONE LINE fields only

PRACTICE

DO A PHONE LIST TOGETHER

SEQUENCE
F - FILE
D - DESIGN FILE
D - DESIGN NEW FILE
OPTIONS MENU
FORMAT SPEC
HOW TO FORMAT - HELP F1

PRESS F10 when design is finished

F. TO ASSIGN INFORMATION TYPES

1. FORMAT SPEC comes up - assign information type
   - Press F1 - HELP - list of information types - Text is preset

   F6 - Expand Field - Long Value:
   Contents of the field shown after long value prompt -- Right arrow appears in the field that is too short

G. TO ADD DATA

1. Type fields in - FOLLOW SCREENS

2. Edit - type over

3. Delete is F3 - a warning appears

   In number and money fields - only numbers, commas, periods and dollar symbols may be used

4. DITTO - F5 - repeats information from a previous form with the same field

5. DITTO - Shift F5 - repeat information in whole forms from one document to another as long as the fields match

6. PRINT - F2 - for form on screen
   CTRL F2 - for all or part of new forms added
   CTRL HOME - first form you added

Appendix I

Second Instructional Material Set

Q & A ---FILE

TO CREATE A DATABASE FILE:

1. You Start by DESIGNING a Form to hold information.

2. GO TO THE MAIN MENU

MAIN MENU	
F - File	A - Intelligent Assistant
R - Report	U - Utilities
W - Write	X - Exit Q & A

3. CHOOSE <FILE>

4. YOUR SCREEN WILL SHOW THE:

FILE MENU	
D - Design File	C - Copy
A - Add data	R - Remove
S - Search/Update	M - Mass update
P - Print	B - Backup

Selection: D

Esc-Main Menu F1-Description of Choices <-- Continue

5. FROM THE FILE MENU YOUR SCREEN WILL SHOW THE:

DESIGN MENU

D - Design a New File
R - Resign a file
C - Customize a file

In the DESIGN menu you MUST GIVE THE File a name before you design the file. A box will appear to prompt you for a filename.

Data File: C:\QA\files\filename

DEFINITION OF TERMS

LABEL	Tells the kind of information that should go in the information blank
FIELD	An individual label and its information blank
VALUE	The information you enter in the field
RECORD	A filled out form
DATABASE	A collection of filled out forms with the same design and under the same file name

6. LOOK AT THE SAMPLE FILES

Press <S>
Highlight the file you want to look at
Press <Return>

a. Sample1
b. Sample2
c. Sample3
d. Sample4

7. LIMITATIONS of the File:

10 screens of 21 lines each

Total -- 210 lines

8. SUGGESTIONS FOR FILE DESIGN:

1. Meaningful labels - no abbreviations
2. Flexible information - include everything
3. Plan the layout - eye pattern, emphasis

9. STEPS TO DESIGN A FORM:

1. Layout fields
   Create identification labels
   Allocate space

Exercise: LAYOUT A FORM TO CONTAIN THE FOLLOWING INFORMATION

Filename -- B:\Names.dtf

Last Name	Job Title
First Name	Phone Number
Address	Extension
City	Sex
State	Birthdate
Zip code	Salary
Department	Comments

PRESS <F10> WHEN YOU FINISH ENTERING THE DESIGN

10. FORMAT SPEC -- appears after you design your file

Assign information types to each field --
Press <F1> for Help

NOTE: For fields that are short but need extra space for instructions PRESS <F6> -- Long value

```
                                        First Name :  T
Last Name :  T
Address :  T
City :  T                    State :  T                 Zip :  T

Department :  T                   Extension :  T     Salary : M

Job Description :  T
```

In each field, type a letter to say what TYPE of information goes in that field. The information types are:

T = Text N = Number D = Dates
Y = Yes/no M - Money H = Hours (time)
K = Keywords (as in properties, categories)

You can also enter format options. Press F1 for more information.

Names.dtf Format Spec Page 1 of 1

How TO FORMAT: The Format Spec

In each field,enter an information TYPE followed optionally by format OPTIONS:

TYPE	MEANING	FORMAT OPTIONS
T	Text	JR = Justify Right U = Uppercase
K	Keywo.d	JC = Justify Center
Y	Yes/no	JL = Justify Left
N	Number	JR, JL, JJC
M	Money	0-7 = # of decimal digits(for N only) C = insert commas
D	Date	JR, JL, JC
H	Time	

1. CHOOSE GLOBAL FORMAT OPTIONS

```
Currency symbol.............................: $
Currency placement..........................: Leading   Trailing
Space between symbol & number...............: Yes   No
# of currency decimal digits................: 0 1 2 3 4 5 6 7

Decimal convention..: 1234.56     1234,56

Time display format. :  4:55 pm   16:55     16.55

Date :  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1 - Mar 19, 1968   6 - 19/3/1968   11 - March 19, 1968   16 - 03-19-1968
2 - 19 Mar 1968    7 - 03/19/68     12 - 19 March 1968    17 - 19.03.68
3 - 3/19/68        8 - 19/03/68     13 - 3-19-68          18 - 19.03.1968
4 - 19/3/68        9 - 03/19/1968   14 - 3-19-1968        19 - 1968-03-19
5 - 3/19/1968     10 - 19/03/1968   15 - 03-19-68         20 - 1968/03/19

Esc-Exit                    F9-Go back to Format Spec    F10-Continue
```

4. TO ADD DATA -- CHOOSE <A> FROM THE FILE MENU

ENTER THE FOLLOWING THREE RECORDS:

a. Abbott, Bud
16 First St
Orlando, FL 33045-1122
Art Instructor
583-3465 2343
M 06-06-1946
34,858
Airbrush, stencil

b. Green, Joe
89 Second St
Greenvale, IL 60623-1122
Media Admin. Assist.
718 345-3232 5656
M 09-30-1938
46,345
Photography

c. Green, Karen
56 Third Street
New York, NY 10010
Fiscal Affairs
212 398-8765 1-12-1954
18,324
PC skills, art

BIBLIOGRAPHY

Books

Anderson, R. H. (1983). Selecting and developing media for instruction, (2nd ed.). New York: Van Nostrand and Reinhold.

Craig, R. (1987). Training and development handbook, (3rd ed.). New York: McGraw-Hill.

Dick, W. and Carey, L. (1985). The systematic design of instruction, (2nd ed.). Illinois: Scott, Foresman.

Dunlop, N. (1987). Working with Q & A: Practical techniques in database design. Illinois: Scott, Foresman.

Gagne, R. (1985). The conditions of learning, (4th ed.). New York: Holt, Rinehart, and Winston.

Gropper, L., & Ross, P. (1987). Instructional Design. In R.L. Craig (Ed.). Training and development handbook. Madison, WI: American Society for Training and Development.

Harvey, G. (1986). Mastering Q & A. San Francisco: Sybex.

Kirkpatrick, D. (1987). Evaluation. In R. L. Craig (ed.). Training and development handbook. Madison, WI: American Society for Training and Development.

Knowles, M. (1973). The adult learner: A neglected species, (3rd ed.). Houston: Gulf Publishing.

Laird, D. (1985). Approaches to training and development, (2nd ed.). California: Addison-Wesley.

Mager, R. (1984). Preparing instructional objectives, (2nd ed.), (revised). California: David S. Lake.

Phillips, J. (1987). Handbook of training, evaluation and measurement methods. Houston: Gulf Publishing.

Ralston, A. and Reilly, Jr. E. (Eds.). Encyclopedia of computer science and engineering. (2nd ed.). New York: Van Nostrand Reinhold.

Rogers, C. (1969). Freedom to learn. Columbus, OH: Charles E. Merrill Publishing.

Walden, J. (1986). Getting the most from Q & A. Berkeley: Osborne, McGraw, Hill.

Periodicals

Archer, N. (1988, Jul). End user software selection. Journal of Systems Management 39, 32-39.

Bilof, E. G. (1987, Jan./Feb.). How to design and use a culture area database with PFS:File and PFS:Report. The Social Studies, pp.35-41.

Brockfield, S. D. ((1988, Winter). Understanding and facilitating adult learning. School Library Media Quarterly, 16, pp. 99-105.

Beaudin, B. (1987, Nov./Dec.). Enhancing the transfer of job-related learning from the learning environment to the workplace. Performance and Instruction, 25, pp. 19-21.

Broad, M. (1982, May). Management actions to support transfer of training. Training and Development Journal, 1-5.

Carter, P. (1988, April). Revitalizing society: Practicing human resource development through the lifespan. Lifelong Learning, 11, pp. 27-31.

Cassivi, D. (1989, February). The education of adults: maintaining a legacy. Lifelong Learning, 12, pp. 8-10.

Dalellew, T., & Martinez, Y. (1988, Sum). Andragogy and development: A search for the meaning of staff development. Journal of Staff Development, 9, 28-31.

Dwyer, C. (1987, Winter). Microcomputer literacy and andragogy. Media and Adult Learning, 9, pp. 27-30.

Feur, D. and Geber, B. (1988, Dec.). Uh-Oh...second thoughts about adult learning theory. Training, 25, pp. 31-39.

Hedley, C. (1986). Software Feature: What's new in software? Computer progarms for the adult learner. Journal of Reading, Writing, and Learning Disabilities International, 2, 359-363.

Hendrix, G. (1989, March). A1 Power to the People. PC Computing. p. 70.

Irwin, M. and Young, D. (1988, April). Integrating computers into adult literacy programs. Journal of Reading, 31, 648-652.

Watson, E. (1986). Small Group Instruction. In A. B. Knox, (Ed.). New Directions for Continuing Education. San Francisco: Jossey-Bass, p. 55.

Technical and Research Reports

Center for Educational Technology. (1976). Interservice Procedures for Instructional Systems Development. Contract No. N61339-73-C-0150). Tallahasee: Florida State University.

Master's Theses

Lowey, N. (1989). Office Automation training module: A self-instructional guide. Unpublished master's thesis, New York Institute of Tecnology, Old Westbury.

Millett, J. (1989). Maintaining electronic data bases: A CAI lesson developed for the New York City Police Academy Computer School's Data manager training program for application users. Unpublished master's thesis, New York Institute of Technology, Old Westbury.

O Connor, A. (1989). The systematic design and evaluation of instruction for the mastery of learning independently. Unpublished master's thesis, New York Institute of Technology, Old Westbury.