DOCUMENT RESUME

ED 075 603 VT 019 827

AUTHOR Hungerland, Jacklyn; And Others
TITLE Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations. Final Report.
INSTITUTION Human Resources Research Organization, Alexandria, Va.
SPONS AGENCY California State Dept. of Education, Sacramento.; Pacific Grove Unified School District, Calif.
REPORT NO HumRRO-TR-72-28
PUB DATE Oct 72
NOTE 65p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Curriculum Development; Educational Objectives; Entry Workers; Individualized Instruction; *Instructional Materials; Job Skills; *Models; *Office Occupations Education; Program Development; Program Evaluation; Skill Analysis; *Student Motivation; Task Analysis; Task Performance
IDENTIFIERS *Program Implementation

ABSTRACT

This project was conducted to design an instructional model capable of producing high levels of student motivation and proficiency, using the office cluster of business occupations as a vehicle, and to formulate a plan for field implementation and evaluation of the model. To achieve the objectives, project personnel, secondary business teachers, and an advisory group: (1) established a hierarchically arranged clustering of the office occupations, (2) identified job functions and tasks, (3) performed detailed task and skill analyses, (4) developed instructional objectives for all the job tasks, (5) constructed skill/competency matrices, and (6) established entry-level performance standards for the various jobs. The resulting performance-oriented model was devised to permit any student to prepare for entry level employment, it provides for continuous feedback, individualization of instruction, skill mastery, and inclusion of students as the instructional medium. Seven of the 15 job-instructional packets, developed in conjunction with the model, were pilot tested with 35 high school students. Comparisons of the performance of 35 experimental subjects with 35 control subjects indicated that the experimental subjects had statistically significant superior job knowledge and job performance. A detailed plan for implementation and evaluation is included in this report. (Author/SB)

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Technical Report 72-28

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# Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations

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HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

October 1972

Prepared for

**The Pacific Grove Unified School District**
Pacific Grove, California

Supported by

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HumRRO Division No. 3
Monterey, California

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The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It is a continuation of The George Washington University Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation.



Published
October 1972
by
HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

| BIBLIOGRAPHIC DATA SHEET | 1. Report No. HumRRO-TR-72-28 | 2. | 3. Recipient's Accession No. |
|---|---|---|---|
| 4. Title and Subtitle<br>DEVELOPMENT AND PILOT TEST OF A CAREER-ORIENTED, PEER-INSTRUCTIONAL MODEL IN THE OFFICE CLUSTER OF BUSINESS OCCUPATIONS | | | 5. Report Date<br>October 1972<br>6. |
| 7. Author(s)<br>Jacklyn E. Hungerland, Eugene R. Michaels, and John E. Taylor | | | 8. Performing Organization Rept. No.<br>Technical Report 72-28 |
| 9. Performing Organization Name and Address<br>Human Resources Research Organization (HumRRO)<br>300 North Washington Street<br>Alexandria, Virginia 22314 | | | 10. Project/Task/Work Unit No.<br>11. Contract/Grant No. |
| 12. Sponsoring Organization Name and Address<br>The Pacific Grove Unified School District<br>Pacific Grove, Calif.<br>(Research supported by the California State Department of Education, Sacramento, California) | | | 13. Type of Report & Period Covered<br>Final Report<br>14. |

15. Supplementary Notes

Research performed by Division No. 3, Monterey, California

16. Abstracts

The purpose of this project was to develop an instructional model capable of producing high levels of student motivation and proficiency, using the office cluster of business occupations as a vehicle. A peer-instructional approach was used in developing the training system; elements emphasized were performance orientation, entry-level skill mastery, immediate feedback to students and teachers, individualization of instruction, heightened student motivation, high job relevance, and low cost. Fifteen job-instructional packets were developed, and seven were given a pilot test at Pacific Grove High School with promising results. A detailed plan for implementation and full evaluation was prepared as part of the report.

17. Key Words and Document Analysis. 17a. Descriptors

*Education
*Employment
*Job Analysis
*Instructors
*Performance Evaluation
*Schools
*Specialized Training
*Students
*Skilled Workers
*Supervisors

17b. Identifiers/Open-Ended Terms

Office Skills
Teachers
Interviews
Quality Control
Skill Mastery
Office Education
Career Oriented
Peer Instruction
Office Cluster
Business Occupations

17c. COSATI Field/Group 05/09

| 18. Availability Statement | 19. Security Class (This Report) | 21. No. of Pages |
|---|---|---|
| Distribution of this document is unlimited. | UNCLASSIFIED | 64 |
| | 20. Security Class (This Page) UNCLASSIFIED | 22. Price |

FORM NTIS-35 (10-70) USCOMM-DC 40329-P71

# FOREWORD

This publication marks the completion of the Human Resources Research Organization Project No. S72-2, Research to Develop a Model Instructional Program in the Office Cluster of Business Occupations. The project was performed under subcontract for the Pacific Grove Unified School District, Pacific Grove, California. This report summarizes project activities, describes in detail the development and pilot testing of the model, and presents data on performance and attitudes. The work was supported by funds under Title I, Part C, Section 121(b) of Public Law 90-576, as set forth in Prime Project Agreement No. 27-66134-C147-71 between the Pacific Grove Unified School District and the California State Department of Education. Dr. William C. Carey, Superintendent, Pacific Grove Unified School District, served as Project Director.

The research was conducted at HumRRO Division No. 3, Monterey, California with Dr. Howard H. McFann, Division Director, named as Principal Investigator. The research staff consisted of Dr. John E. Taylor, Mrs. Jacklyn E. Hungerland, Mr. Eugene R. Michaels, and Mr. Gary Goettelmann.

As prescribed by the contractual agreements, a Policy Advisory Committee was established to provide policy and guidance for the work. Its members were Dr. James H. Crandall, Coordinator, Research Coordinating Unit, California State Department of Education; Mr. Brenton R. Aikin, Chief, Bureau of Business Education, California State Department of Education; Mr. Rex Dunipace, Principal, Pacific Grove High School; and Dr. Howard H. McFann, Director, HumRRO Division No. 3. A Working Advisory Committee was also established. Its members consisted of Mr. Jack Wood, Head of the Business Education Department, Mr. Frank Moore, Business Education teacher, and Mrs. Evelyn Neale, Business Education teacher, all at Pacific Grove High School; Mr. Gordon Ray, Coordinator, Vocational Education, Salinas-Gonzales Regional Occupational Program; Miss Ellen Bowers, Business Education instructor, Monterey Peninsula College; and Mrs. Kimi Weber, Business Education teacher, Seaside High School.

The efforts of Mrs. Neale, Mr. Wood, and Mr. Moore of the Pacific Grove High School faculty are due special mention. Their enthusiastic cooperation contributed in large measure to the project's successful execution.

Investigators undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official positions or policies of the California State Department of Education or of the Pacific Grove Unified School District.

Meredith P. Crawford
President
Human Resources Research Organization

# SUMMARY AND RECOMMENDATIONS

## BACKGROUND

The job market for individuals skilled in the office occupations is expanding at a significant rate. Recent vocational education data compiled for the State of California show that the largest student enrollment and the greatest expenditure of funds for vocational education in the State's public schools occur in the area of office occupations.

Though dramatic advances have been made in the technology of instruction, only recently have changes begun to be effected in vocational education. Instruction is still largely conducted under the classroom, subject-oriented model. Experience in a variety of training research indicates that other models have the potential for improving learning, student attitudes, the level of demonstrated skill mastery, and entry-level job preparation.

At this time, the staff of the Bureau of Business Education of the California State Department of Education has as a broad objective the development and implementation of performance-oriented instructional models. This broad objective is in harmony with the move by the U.S. Office of Education toward Career Education.

## OBJECTIVES

The general objective of this project was to design an instructional model capable of producing high levels of student motivation and proficiency, using the office cluster of business occupations as a vehicle. Specifically, the project was established to design a formal, ready-to-be-tested instructional model providing for these elements: performance orientation, entry-level skill mastery, immediate feedback to students and teachers, individualization, heightened student motivation, high job relevance, and low cost. The model was to integrate training in a synthetic business office with instruction in an adjunct skills center for developing enabling knowledge and skills.

A second objective was to formulate a plan for conducting a subsequent full-scale field implementation and evaluation of the model.

## PROCEDURE

The project was conducted as a cooperative effort between the Pacific Grove Unified School District of California and the Human Resources Research Organization, Division No. 3, at Monterey, California. HumRRO personnel performed the research and developed the model, which was pilot-tested in the business education department of the Pacific Grove High School. The school district provided teachers, students, and facilities.

The required background research, and the development and pilot testing of the model proceeded in systematic stepwise fashion.

## BACKGROUND RESEARCH AND DEVELOPMENT

Literature relevant to the project objectives was explored extensively. We examined reports of prior work which defined and clustered the office occupations, analyzed tasks and skills required, generated instructional objectives, developed and tested innovative approaches to instruction, surveyed industry standards, and developed office simulations

(including commercial simulations). Members of the project team also visited other school districts in the state and corresponded with representatives of out-of-state districts which were working in the simulated office-instruction context.

Drawing upon the voluminous literature, HumRRO's accumulated knowledge and experience in training and related research, the expertise of the business education teachers of the Pacific Grove High School and others, and inputs from our working level advisory group and the California Bureau of Business Education, we (a) established a hierarchically arranged clustering of the office occupations, (b) identified job functions and tasks, (c) performed detailed task and skill analyses, (d) developed instructional objectives for all the job tasks, (e) constructed skill/competency matrices, and (f) established entry-level performance standards for the various jobs.

## CONSTRUCTION OF THE MODEL

An instructional system was devised that would permit any student to prepare for entry-level employment at any or all job levels of the office occupations cluster. The model system is job-performance oriented in that the content which students learn consists of the integrated knowledge and skills needed for performing the tasks of entire jobs. It provides continuous feedback as to each student's progress, it provides for complete individualization of instruction, it insists upon skill mastery at all levels, and it employs the students themselves as *the* instructional medium.

The classroom teacher is cast in a monitor/supervisory role to prime the system, keep it functioning, and maintain quality control. The teacher also performs a job-surrogate role which provides a flexible capacity, so that the functioning system can expand or contract to simulate any number or combination of jobs that might be dictated by student need.

Rather than being a static simulation of a complete functioning office, this model serves as an instructional milieu in which any student can learn any one or combination of jobs. That is, the model simulates jobs rather than an entire office.

Separate job-station instruction packets containing instructional materials and administrative and procedural guides for each job in the office occupations cluster were written to support implementation of the system.

## PILOT TESTING OF THE MODEL

Seven of 15 job-instructional packets were selected for pilot testing in the Pacific Grove High School office occupations courses. Before the pilot test was started, demographic, academic, and attitude data were gathered on all 200 students enrolled in these courses.

On the basis of these background data, 35 students were selected to undergo instruction in the new system. They were designated as "experimental" students and were matched, student by student, on several dimensions with 35 other "control" students who were selected to continue with the conventional instruction.

On tests prior to the pilot study, the experimental and control students were alike in attitude and in performance. Administrative difficulties precluded empirically determining how they compared on job knowledge, but considering the near-perfect

matches achieved on a variety of other dimensions, we assume they were not different. The pilot test ran for three weeks, or for approximately 14 class hours of instruction for both groups.

Post-study tests indicated that, compared to the controls, the experimental students (a) had statistically significant superior job knowledge, and (b) were dramatically superior in job performance. Post-study tests on the experimentals only showed indications of positive shifts in attitude, as a result of the experimental instruction.

The model itself proved to be a viable one, needing only minor modifications prior to more formal implementation and evaluation. Students and teachers enthusiastically attested to its advantages over conventional classroom instruction.

## RECOMMENDATIONS

The model should be subjected to large-scale field test in the office occupations courses of a number of school districts varying in size, student body composition, wealth, and other factors. It should be tested for its applicability across various vocational education areas, such as distributive occupations, home economics, and trade and industry. It should be tested for its general use all along the Career Education spectrum, from kindergarten through high school. A detailed plan for implementation and evaluation was prepared and is included in the report.

# CONTENTS

# Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations

# BACKGROUND AND RATIONALE

## OBJECTIVES

With the job market for individuals skilled in the office occupations expanding significantly, leaders in the business area of vocational education have begun implementing or incorporating some of the dramatic advances in instructional technology developed within the past decade. One of these advances focuses on performance-oriented training in situations where job-relevance of instruction is vital. There has been a keen interest in introducing such performance-oriented instructional programs in the area of office education, where, traditionally, instruction has been tied to a classroom, subject-oriented model. The project reported here was established to address these instructional needs in office education.

The specific goals of the project were to (a) construct an instructional model, including plans for establishing a synthetic job-instructional business office and adjunct skill center, and (b) provide a detailed plan for implementing the model, and procedures for monitoring the implementation and evaluating the outcome.

In addition to these project goals, it was felt that it would be both appropriate and desirable to use a career orientation in developing the instructional system. Toward this end, career information from the California Bureau of Business Education was augmented with information from the *Dictionary of Occupational Titles* and the U.S. Office of Education to constitute a career ladder for the office occupations cluster. This job pattern was incorporated as part of the basic structure of the instructional system.

## DESIGNING AN INSTRUCTIONAL MODEL

### Systems Approach

The systems approach—which HumRRO has used consistently in educational and related research—furnished us with generic procedures for designing a performance-based model for office education. In taking this approach, several procedures are established and parameters considered in order to integrate all elements into the total instructional system—task analyses are conducted, behavioral objectives determined, performance criteria established, and cost and time constraints considered.

*Task Analysis*

Any job is comprised of a set of tasks. Through task analysis we find and order the important tasks a student must be able to do if he or she is to be an adequate job holder. These tasks become the content of the instructional system.

*Behavioral Objectives*

A task is a description of what someone does on the job. A behavioral objective is a formal statement describing what a student must learn. It converts the task description into learning terms, specifying what the student should be able to do at the completion of instruction. In addition, it defines what criteria the student must meet to show that he, in fact, has learned.

*Quality Control*

A training system must have means of finding out how well students are learning and whether they have learned what they were supposed to learn. The means—tests, checkpoints, unscheduled checks, examinations—are the collection of ways the system has established to collect information about the performance of its students.

*Constraints*

Any system operates within limits: It has only a certain amount of time, money, facilities, and personnel with which to reach its goals. It must choose goals, instructional strategies, and management procedures that fall within the limits imposed on it.

## Instructional Principles

In addition, we have adopted certain established instructional principles that engender the most effective learning conditions.

*Performance orientation and job relevance*

Learning is most effective when the student has an active role in acquiring skills and capabilities. Skills become immediately relevant to him when they are placed in a context similar to the one in which he is to use them later. The learning situation must, therefore, be performance-oriented, and all instruction should have job relevance.

*Skill mastery*

In learning a skill at a fixed criterion level, success cannot be partial; either the student can perform appropriately or he cannot. If a student cannot perform to criterion, he must receive additional training until he can meet the established mastery criterion.

*Immediate and detailed feedback*

It is important for a student to get rapid and detailed information about how well he is learning while he is in the act of learning. This information can help him correct his mistakes, spend time where it is needed the most, and find out what he still needs to learn. In the same vein, rapid and detailed feedback to the instructor and to the system managers serves as a continuing indicator of the student's progress and of the quality of instruction.

*Self-paced and individualized instruction*

In a system that stresses an absolute criterion, individual learning rates must be accommodated to allow each person to achieve mastery of the skills. Instructional methods, such as the lecture, that fix the pace at which material is presented, leave some students behind and bore others. In a peer-instructional system, material is presented on a one-to-one basis—that is, to one student by another student who has already mastered it. This approach provides for self-pacing and specifically individualized instruction.

### Instructors as Managers

In many learning situations, the instructor has the active role; he talks and asks questions and the students listen, take notes, and respond. When the student has the active role in learning, the role of the instructor changes drastically. He manages the conditions for learning, provides feedback to the students, and checks to see how well they are learning. In short, his role changes from presenter to manager and guide of learning.

## DESIGN SOLUTIONS FOR AN OFFICE-EDUCATION MODEL

Later sections will describe the instructional model in detail, along with the office skills selected for instruction and the standards adopted for mastery. This section introduces the general structures which we adopted as the means to satisfy the goal of the project: creation of a synthetic job-instructional business office and adjunct skill center.

1. Self-Instruction. We instituted a skill center for students to acquire enabling skills and knowledges. We designate as "enabling" any skill or knowledge on which students can base further skill development. By "skill center," we do not mean an actual separate locale, but any place where students can build accuracy and speed in the mass-practice skills, such as typing and shorthand. Learning to type, to take shorthand notes, to upgrade English grammar and punctuation—all might be done by a student at his own pace and initiative in the center. Any available auto-instructional materials—textbooks, programmed workbooks, audiotapes, cassettes, and film loops—can be used as the means of instruction.

2. Peer Instruction. We adopted peer instruction as the chief instructional method when students are learning to perform job tasks. Students who have acquired a set of skills can act as individual instructors to other students learning the same set of skills; they can teach the task, answer questions, provide instant feedback, and offer any sort of help and guidance to the learner; they are a highly flexible and economical vehicle of instruction. Both students benefit from the interaction.

A formal systematic use of peer instruction has been tested in another instructional model.[1] It provided an economically feasible means of individualized instruction with high achievement, even for slow learners, and enhancement of motivation and self-esteem.

3. Self-paced Instruction. A management technique had to be devised to allow students to move from one job to another when they want, without disrupting the system. We adopted a job surrogate as having the function of expanding and contracting operations within the training system so that a free flow of students through jobs could be maintained.

4. Quality Control. In order to verify that students have learned job skills, we adopted the device of re-administering all of the mastery performance tests for a given job during the job application procedure. Before a student can "hold a job" in the synthetic business office, he must demonstrate that he has at his command all the skills he needs for successful performance; if he does not have these skills, he cannot be an effective instructor for another student. If he fails the mastery tests, he must go back and relearn the skills he needs to meet the established criteria.

[1] Kenneth Weingarten, Jacklyn E. Hungerland, and Mark F. Brennan. *"Development and Implementation of a Quality-Assured Peer-Instructional Model,"* final report on Work Unit APSTRAT, HumRRO Technical Report in preparation.

5. Job Simulation. The main thrust of the instructional model is toward simulating jobs students actually might have to perform in an office. Through learning job skills, students are learning what they will actually need for employment. Even though their involvement in the instructional system may be brief, they will still be trained for some sort of real—albeit low entry level—job. As students progress through the system, they are accumulating more and more skills, preparing them with a wider range of capabilities for potential employment.

## DESCRIPTION OF THE MODEL

### GENERAL APPROACH

A review of the literature and ongoing programs indicated that the standard approach to business office simulation is characterized by two features: (a) simulation is used as the terminal experience in the training program, and (b) the jobs within the simulation are interdependent, the effective functioning of the "office" being dependent on the constant operation of all of its parts. (Krawitz, 1971; Twelker, 1969, Clovis High School Office Simulation Course; Office Occupations Training Course, Daly City; University of California, Division of Vocational Education.)

This type of simulation is neither a vehicle nor a stimulus for skill acquisition; at best, it helps to integrate fragmented components in a somewhat realistic setting. In its terminal position in the training program, the simulation must be staffed by people who come to it with all skills previously acquired. In some cases, these skills have been acquired one, two, or three years before the student enters the simulated office; if there has been too little intermediate practice, the student may spend most of this time in the "office" regaining confidence and competencies in "rusty" skills.

The tendency toward adoption of this approach in standard simulation seems to have resulted from considerations of expediency rather than concern with optimal conditions for learning. Under these circumstances, the potential value of the simulated office as a functional context for learning is diminished.

A basic premise in our concept is that the job or the office experience must be the initial and continuing experience throughout the training program. In addition, because of practical complications inherent in variable student flow and variable skill levels among students, jobs within the office simulation must be independent of each other without sacrificing verisimilitude.

### OVERVIEW OF THE MODEL

Figure 1 presents an overview of the conceptualization of the instructional model. Many job station modules, representing many different levels on the career progression ladder, would be operating at any given time.

In entering a module of instruction (job station), the student must pass the job placement tests and the job interview (for which he is graded on several personal and interpersonal characteristics). If the student passes the application process, he proceeds to the three-way role—job performer and peer instructor for this new job, trainee for a job higher on the career ladder.

If the student fails any of the placement tests for a job, he returns to his trainee status and continues to practice until he can pass the tests. This point represents the built-in quality control mechanism that would signal the system manager to tighten the testing procedures in the module from which the failing applicant came. If the student

Career-Oriented Peer-Instructional System

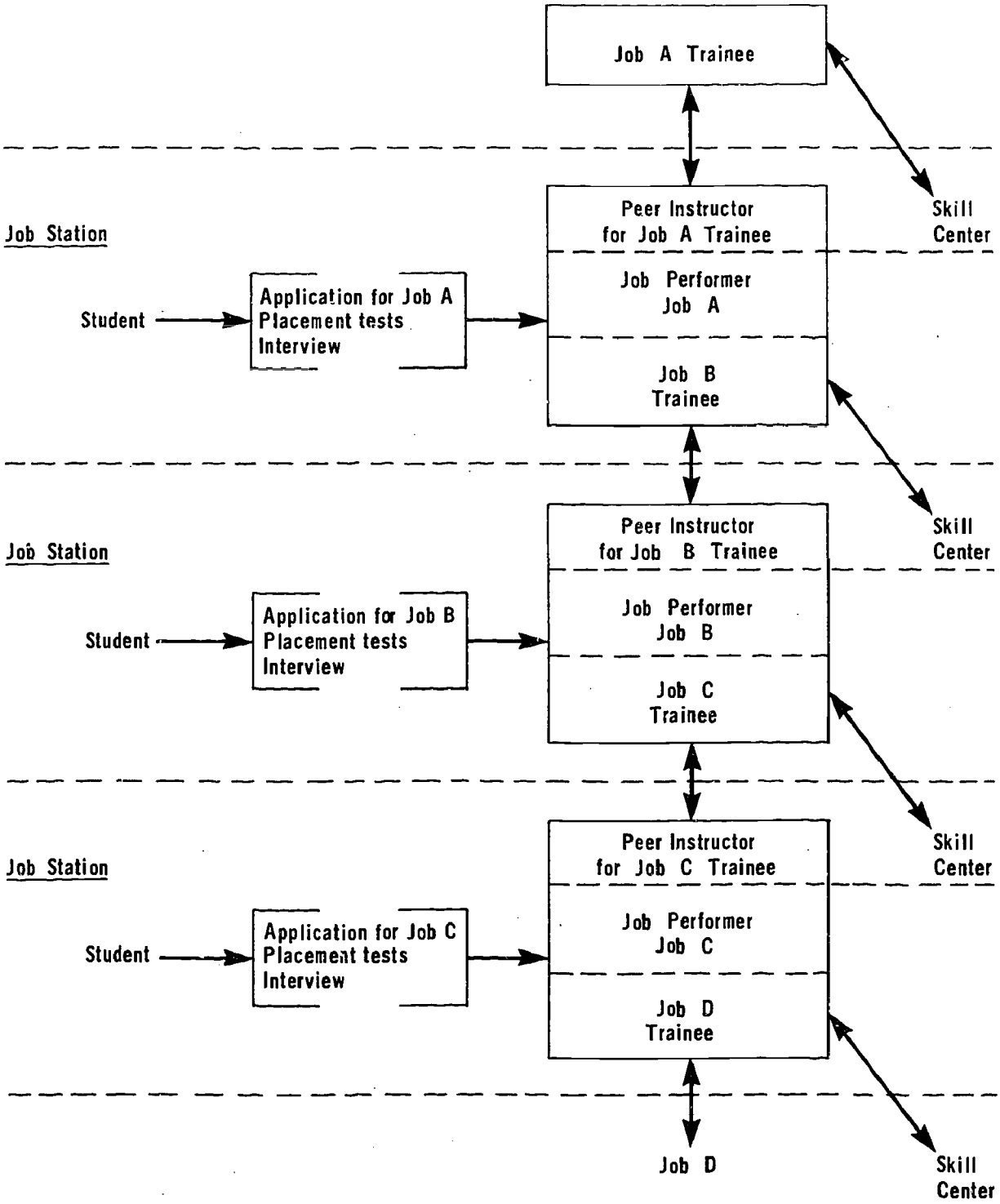



Figure 1

fails in any of the interview categories, he returns to trainee status until he has learned to correct whatever deficiency caused him to fail.

Rather than each job being dependent upon another job in order to maintain work flow, work can be generated for each job from a centralized position where one or more persons (teachers or students who are advanced enough in the program to take over management functions) can serve to coordinate work flow through the job stations when such intervention is necessary. We have called this function the job surrogate. The use of such a surrogate provides the necessary flexibility in the number and kind of jobs offered and precludes the managerial problems that could be encountered with a free flow of students in a job-interdependent system.

An additional advantage of utilizing a job surrogate is that it provides the capability to customize the curriculum to meet students' specific needs. For example, suppose a student has reached the stenographic job level in the system and expresses an interest in becoming a legal stenographer. Legal-specific instructional materials and job tasks can be supplied with very little effort, and the job surrogate can provide the necessary work flow into a legal-stenographic position and receive outputs from that position (thereby substituting realistically for the lawyer "boss").

The action of the surrogate is somewhat like that of an accordion—the function expands and contracts in direct relationship to the number and kinds of job stations that are operational. It should be noted, however, that the surrogate will always function as a monitor of the system—it is only the degree to which the surrogate takes active part in the work flow that will fluctuate.

For example, should the student population and capabilities allow for all types of jobs to be filled, and these jobs are all operating, the work flow would be directly between and among jobs and the function of the surrogate for job *inputs* would contract to zero. Some job *outputs* would, however, be received by the surrogate when the job grouping does not include an authority or "receiver" higher than the job from which the material is generated. In such a case, some of the system interactions might be like those shown in Figure 2A, where the output of the executive secretary is the only one going to the surrogate.

If, in this scheme, there is no Executive Secretary job station operating, then the surrogate would take over the functions of that station. In this case, system interactions would be as shown in Figure 2B, where the surrogate handles both inputs and outputs for the higher-level job stations operating in the "office."

This approach allows for developmental flexibility to a degree that cannot be attained in a fixed simulation program in which jobs are interdependent, where a change in any job would necessarily entail change in all related jobs. In addition, the use of a surrogate approach allows for ready expansion of the office cluster, giving relatively limitless capability in job simulation.

What is set up, then, is *job* rather than *office* simulation, even though the job simulation is established in an office-like setting. In fact, what is created is a "World of Work" program, incorporating a skill center, job simulation, work experience, job acquisition techniques, and on-the-job behaviors and interpersonal skills. At the same time, the system permits customization of instruction.

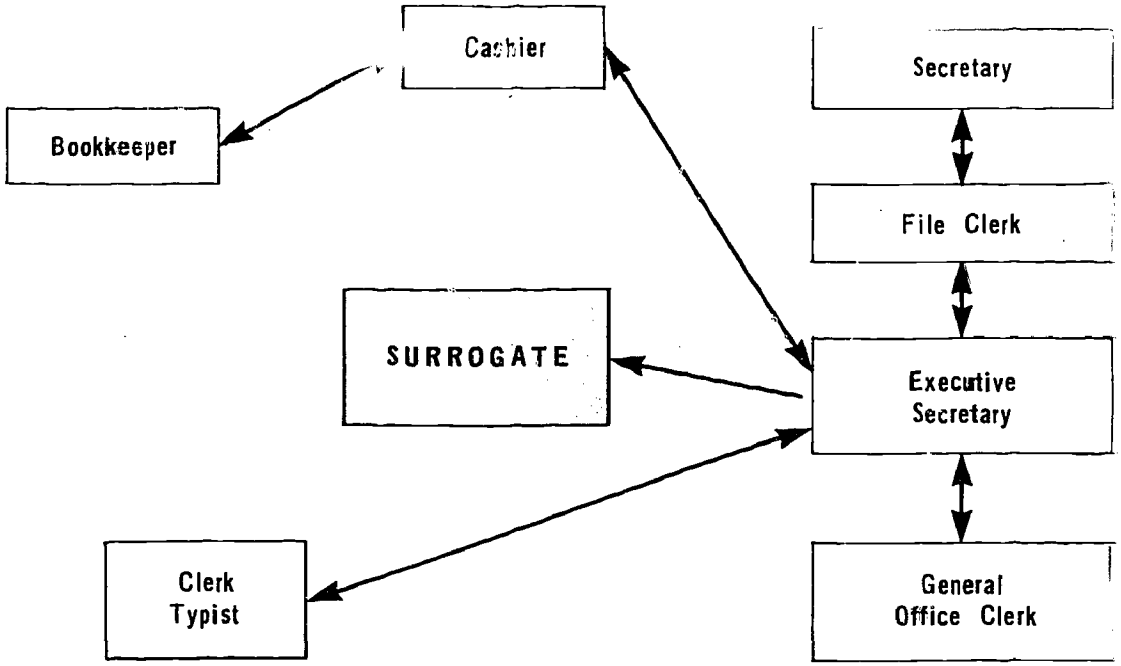
## STUDENT FLOW WITHIN THE SYSTEM

As has been briefly noted, in order to use the available resources to best advantage and meet our objectives, we adopted a modular approach. Each module represents a job station, and the progression through each module is as follows:

1. Student enters system,
2. Goes to "employment service,"

**Function of Surrogate in Work Flow of Synthetic Office**

A – Minimal Surrogate Function in System Interaction




B – Expanded Surrogate Function in System Interaction

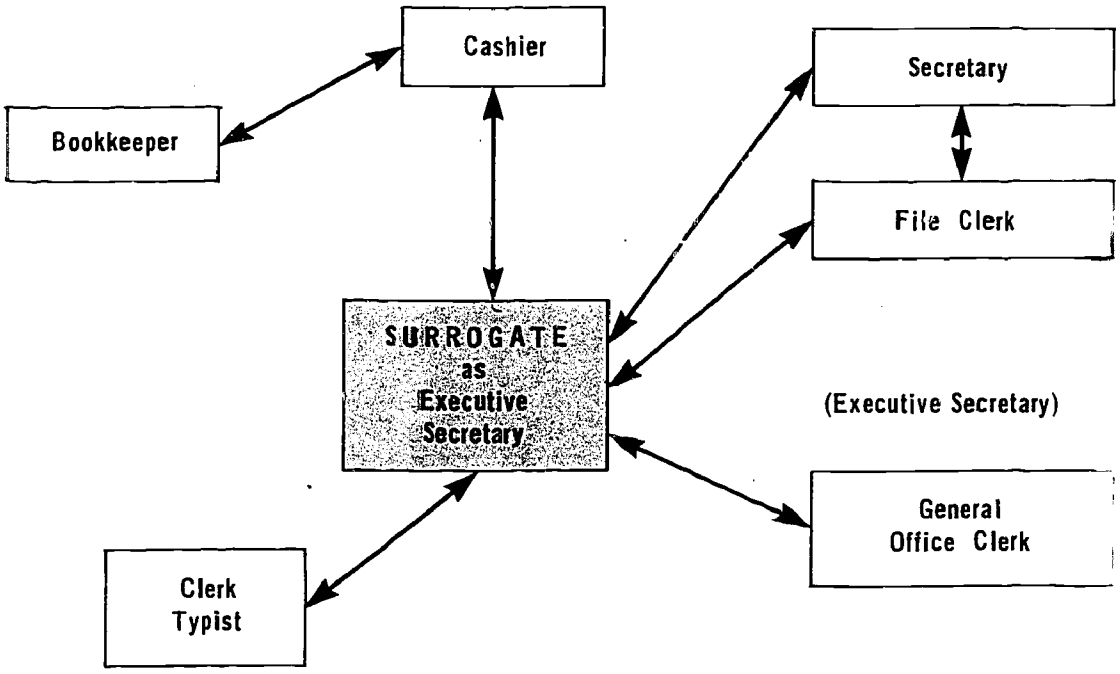



Figure 2

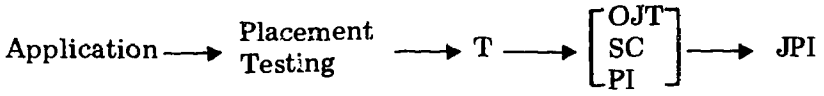
3. Surveys list and description of available jobs,
4. Completes application form for job he wishes to do,
5. Gets appointment for interview,
6. Teacher (or later, perhaps, an advanced student) interviews applicant,
   a. Gives appropriate skill test(s) and
   b. Determines applicant's interests and aspirations (through interview).
7. On the basis of test results and interview, student is "hired" for an appropriate job—a job for which he *is* prepared through previously acquired skills. When hired into the job, the student becomes the "job performer." (Students at different grade levels will probably have progressively greater capabilities, so that a 12th grader might conceivably fill a stenographer's position while an entering 9th grader might be able to fill only a duplicating machine operator's job.) Job performers are required to be on the job for specified "office hours," so that they are available as a peer instructor to teach "new hire" trainee students. At the same time, when their office hours are over, they are free to go to another, advanced job for orientation or instruction, to go to the skill center, or to go out into a work experience program.
8. When a trainee student has mastered all the skills for a given job, he is "hired" into that job as a job-performer. His former peer instructor is then freed from his instructional responsibility, and the new job performer is available to instruct another "new hire" trainee.
9. Any job performer may re-apply to the "employment service" at any time he feels he has acquired the requisite skills for another, more advanced job. Steps 2 through 8 are then repeated for each new job assignment the student might receive.

It is not likely that a 9th grader just entering the curriculum can make a meaningful choice in favor of an office career without further information—what jobs are available, what job duties are, what jobs fit his interests, and so forth. To help the new student answer some of these questions, jobs in the simulated business office would be filled very shortly after the beginning of each term, and the incoming student could observe all jobs in operation, thereby getting an idea of the career opportunities.

There would probably be some students who were interested only in learning typing. Despite their limited aspirations, these students could be brought into the system and "hired" as part-time clerks to learn the skills adjunctive to simple typing "X" words per minute (e.g., changing of ribbon, cleaning and care of machine, use of different reproduction mats, etc.). Should students wish to acquire only some basic office skills, they could still leave this program with job competencies. Even the "typing only" students would have been taught in a functional context with job relevancy.

When a student is "hired" for a job, he becomes a job-performer. He also becomes an instructor for any trainee assigned to him. We, therefore, call this student a job-performer/instructor (JPI). At the same time, he himself may be assigned as a trainee in a job higher in the career progression. He will acquire the skills for the new job in his time outside of his "office hours." If no trainee is available, the JPI student can still be a job-performer, getting practice in and maintaining mastery level of the job skills. The system also assumes the student's command of all jobs previously held. If the need arises, a given student may be required to give instruction to a trainee in a job the student has already vacated. A graduate of the program should be competent in all job skills, not merely those in his terminal assignment.

The role of the student will, therefore, be trichotomous—he is a job-performer, he is an instructor, and he is also a trainee in a more advanced job. The flow for each job for each student is:



When the student enters the system as a trainee (T), he is the recipient of instruction via the skill center (SC) and via the on-the-job training (OJT) provided through peer-instruction (PI) by the job-performer/instructor (JPI). When the trainee masters the required skills, he is cycled into the job as the JPI and instructs another trainee. Many students will enter the system with some job skill capability and will be "hired" initially as JPIs. Their procedure will then be to follow the flow chart, applying for a succession of jobs progressively higher up on the career ladder.

The system, seen as a whole, is made up of several such job stations, operating simultaneously. As the interests and needs of the students fluctuate, the number and kind of job stations will vary to meet the demand. One semester there might be several clerk-typist positions and only a few secretarial or stenographic positions. If the demand for training secretarial personnel exceeds the supply of secretarial job-performers, trainees can double-up and receive simultaneous OJT from one JPI. The greater danger is that there will be no trainee for the job-performer/instructor to instruct. In this system, added practice may be substituted for the immediate act of instruction. While added practice probably does not have the augmenting quality of the instructional experience, it does have merits as a vehicle for "cementing" newly acquired skills. It is also possible that this student may be called upon at a later time to serve as JPI for this job, thereby eventually having the teaching experience.

## ROLE OF THE TEACHER AND QUALITY CONTROL

Teachers in this system have multiple functions:

(1) As the "employment service" and job opportunity managers for the placement and advancement of students.

(2) As the agents for accountability, exercising quality control through:

(a) The administration of mastery tests for skills learned either on the job or in the skill center.

(b) The administration of performance tests to job applicants.

(3) As the job surrogate.

The built-in mechanism for controlling quality is the job application procedure. When an applicant is interviewed for "hire" as a job-performer, his performance on the job skills is measured by performance tests. In this way, as students move on to new jobs, they are automatically tested. If they have not truly mastered the requisite job skills, they will not be eligible for the new job—they will have to return to the skill center or the OJT and work until they *have* mastered the necessary skills.

## EQUIPMENT AND FACILITIES

No need for additional equipment is anticipated in most settings. Demands on equipment use are met by staggering the "office hours" so that equipment is available for the skill center practice use. It should be noted that the "skill center" is not necessarily to be established as a distinct entity or physical location—"skill center" activities may take place at the OJT site or wherever appropriate.

In general, since classrooms are designed to accommodate specific numbers of students, it is anticipated that no additional space is needed to implement this instructional system.

## DEFINITION OF THE CURRICULUM AND PREPARATIONS FOR PILOT TESTING

Two important questions were faced in designing the jobs included in the system: What office skills should students learn? What standards should the students meet to show their competence?

As indicated earlier, jobs are the main instructional modules. When a student learns to perform a job, he is acquiring a set of skills. As he moves from job to job, he is acquiring new skills. The question of what skills to include in each job is vital—the skills must mirror those actually needed by students for employment in that job. In addition, the sum of skills must be comprehensive—instruction must cover all the important office skills through the hierarchy of jobs.

The question of standards also has profound implications for instruction. We had rejected, in advance, the strategy of accepting differential levels of performance and awarding grades "A" through "F," since this strategy is inappropriate for skill instruction. It makes little sense to teach students new skills when they cannot perform well on more basic ones. We chose to use mastery standards under a pass/fail criterion. Once that choice was made, we still had to define mastery—what does the student have to demonstrate to indicate that he has mastered a skill? Because it appeared that industry standards would be a valuable source for mastery standards, we organized our search around that theme.

The questions surrounding office skills and standards will be discussed in separate sections. In part, these sections discuss the general issues, and in part, they are capsule histories of how we went about selecting office skills and standards.

## FACTORS IN SELECTING OFFICE SKILLS FOR INSTRUCTION

Industry has used job function as a main organizational device. A person holding a job, generally speaking, has assigned duties to perform. The best method we have of knowing what that person does is an empirical one—we analyze the tasks that he performs as part of the daily routine.

In the recent past, researchers have gathered such information about office tasks, mainly through self-report surveys of job holders and supervisors, and observation of actual job routines. (Santa Clara County Office of Education, 1972; Ericksen, 1971; Calhoun, 1970; Lanham, *et al.*, 1970; California State Department of Education, Bureau of Business Education, 1969; Perkins and Byrd, 1968.) These efforts have yielded a variety of strategies for ordering the task information:

(1) Frequency lists by job function. This simple procedure lists—for example, under typewriting—all the specific tasks a person who types has to do in an office, ranging from the most frequently performed tasks to those seldom performed. This method does not have a clear methodology for arranging job functions—there are too many kinds of possible job functions to list.

(2) Frequency list by job definition. Tasks are listed under the job title. If a girl works as a secretary, the tasks she most commonly performs are listed first, next most common, second, and so on down the line. Such a method is inadequate because it is very dependent on the sample size and type of sampling. Because job definitions are not standardized, separate categorization may be necessary—legal secretary in large corporation, legal secretary in large law firm, legal secretary for two lawyers, and so on. If an overall summary of all secretaries is attempted, the resulting profile is either ambiguous or so qualified as to be meaningless.

(3) Frequency list by cluster of functions. Similar tasks are grouped under a heading and are arranged in a hierarchy of clusters, ranging from the most common to the least common. The problem with this approach is how the tasks are clustered, because all grouping is done by abstraction. Interpersonal communication might be one such cluster of office tasks, but different job holders may have only very specific kinds of communication associated with their jobs. A receptionist, for example, may communicate with other people in ways that are very different from a file clerk. We may lose needed details through the grouping process.

Some prior conceptualization and decision-making are necessary before office skills are selected for instructional purposes. The ability to perform a job is based on a combination of factors: formal training, on-the-job training or experience, native intelligence, and personality traits. Unless we have a rationale for examining job tasks, the result may be too descriptive for any distinct purpose, such as instruction. For instance: In a list of tasks a secretary performs frequently, "doing housekeeping, dusting, cleaning up coffee cups" is mentioned. If we are to use the list for selecting office skills, a decision has to be made about whether instructional time should be spent teaching office housekeeping.

Clusters of tasks or tasks listed by job title are not usable for instruction per se. They are extremely valuable raw material; they provide a basis from which we can select office skills that we will teach students. In short, this raw material has to be converted into something that is usable.

The typical curriculum in office and business education has already converted the raw material of task analysis, having selected a basic core of skills to teach: typing, filing, shorthand, operating business machines. The surveys mention these skills repeatedly, and thus tell us these skills are necessary for employment.

In designing a new training system, the same conversion must take place. What is going to be taught emerges through a selection process. Empirical information from surveys and observation is an aid in making the decision as to what to teach, but other determinant of selection must be taken into account.

Some tasks may not be worthwhile or necessary to teach in a formal system. Office procedures or routines often fall into this category. For example, business firms often devise specific procedures for sorting and distributing mail, or for processing incoming and outgoing forms. Actual practice varies from office to office. To teach such routines to a student formally when he might better learn on the job is to waste instructional time.

Some tasks may be, in effect, applications of general cognitive skills in a business setting—speaking and writing grammatically correct English; doing arithmetical operations such as adding, subtracting, and multiplying. To learn these skills requires years of schooling. If the training system places these skills within its scope, it expands its function dramatically. As a result the system increases costs through lengthening the instructional process.

Certain tasks may seldom be performed in an office now, but the ability to perform them may be required in the future. A focus on immediate tasks may handicap students who will be looking for jobs two or three years hence. Data processing skills seem to be one such emerging set.

Whatever information is assembled about office skills needed for employment or those most commonly used in an office has to be translated for use in training. A series of decisions cannot be avoided—what will be taught, what is unnecessary to teach, what is unteachable. We must order our teaching priorities and weigh them against our available resources. Task analysis and other sources of information are helpful, but they cannot take the place of these decisions. There is no mechanical or magical process that can bypass the sticky problems of choice and selection.

## HOW WE SELECTED OFFICE SKILLS FOR INSTRUCTION

We followed the predominant pattern in industry and organized a set of skills around jobs. What skills were included in what jobs was determined through several techniques.

The *Dictionary of Occupational Titles*, job profiles based on task analysis, and other research summaries served as one source of arranging office skills under specific jobs. Business education teachers were another source of information about skills needed for entry into various jobs. A review procedure was established, where the skills we selected were subject to criticism, discussion, and inputs by a panel of people experienced in business education.

The process of selecting skills was not a linear one. As we received comments and criticism, we added, deleted, or rearranged skills until we had met certain predetermined goals.

Our chief goal was to prepare students for employment, no matter what length of time they had spent in the system. Therefore, we arranged jobs so that students could accumulate, even after a brief time, a set of job-entry skills.

In addition, we wanted the coverage of skills to be as comprehensive as possible so that students could train for a broad variety of jobs, if they chose. Therefore, we included jobs based on several *main office functions:* filing, typing, dictation, office machines, and bookkeeping/accounting.

Finally, we wanted to make the training system flexible enough so that new jobs could be added or new skills could be incorporated under the existing jobs. For that reason, we conceived of the jobs as instructional modules, making possible revisions due to local needs, shifting conditions and demands. Under the modular approach, any such revision could be made without any large-scale changes to the basic structure of the system.

After we had a list of jobs and tasks to be performed in the jobs, we clustered job tasks into *various skill areas* and arrived at five clusters: filing, typing, office machines, office procedures, and bookkeeping/accounting. We placed skills into clusters primarily as a further check, to verify against past findings that the skills were fundamental to job entry and that no important skills were missing.

Clusters also had an important purpose within the system. They were prerequisite to preparing the terminal objectives which govern what students are to learn in each job. A terminal objective is a descriptive statement outlining in concrete and precise terms what the student should be able to do at the completion of instruction. They enable the teacher to know exactly what must be taught and the student what must be learned.

In our case, we devised terminal objectives as generic task statements. They state what kind of input the student is to receive, what he must be able to do, and what standards he must meet. In typing, for example, a student who has advanced to the secretary position must be able to take a handwritten draft letter, correct any grammatical and punctuation errors, and prepare a mailable copy. A beginning file clerk receives documents that have been coded (i.e., the filing entries are designated) and places them in the correct place in the file.

In choosing what skills to teach, we did not consider our choice to be the final answer. We chose skills that analysis identified as the most basic and common ones students need for job entry, and ones that seemed most worthwhile to teach. More important, we tried to make adaptation and change possible as part of the system. Jobs and skills can be added, whenever necessary, to make instruction more responsive to shifts and new demands in industry's requirements.

## DEFINITION OF THE CAREER PROGRESSION

Based on the literature survey and information previously derived by the California Bureau of Business Education, the career-oriented hierarchy which we identified was, in ascending order:

Duplicating Machine Operator
File Clerk
General Office Clerk
Cashier
Receptionist
Typist
Clerk Typist
Bookkeeper
Stenographer
Secretary
Executive Secretary

Some training, or at least experience, for more advanced students in supervising, planning, and management was also included.

In our original definition of career ladder steps, we identified substeps in four of the jobs: File Clerk (3 steps), General Office Clerk (2 steps), Receptionist (2 steps), and Bookkeeper (3 steps). This strategy was designed to allow more entry points for students with fewer skills. The only readjustment following the pilot test was in the File Clerk breakdown, where we found that only two levels were appropriate, rather than the original three.

## INDUSTRY STANDARDS AND THE DESIGN OF INSTRUCTION

Business educators have had a continuing concern with standards for obvious practical reasons. If they know what standards are used in offices to evaluate performance, then those standards can be adopted in instruction. If they know what skills students need for job entry and at what level of proficiency, then they can proceed to shape instruction around them.

This approach looks straightforward, and it would be, if businesses and industries used *identical* standards to evaluate job performance and to hire new employees. But this has not been the case and it is doubtful whether it ever will be. The problems should become more apparent as we examine the question of industry standards as it relates to the design of instruction.

### Standards Used for Job Entry

The most common model of hiring new employees resembles the following description:

The applicant is asked to fill out a form containing questions on personal background, academic history, and previous work experience. The form often includes questions about what office skills the applicant has, and it asks for references.

The applicant is then given a series of aptitude tests—sorting, vocabulary, typing, and shorthand tests. These tests are generally brief. The typing test usually is a measure of straight-copy speed; the shorthand test, a measure of dictation speed and accuracy.

The culmination is the job interview. The applicant faces an interviewer and answers any questions about himself. The interviewer has the opportunity to form an overall impression of the applicant.

Various surveys have identified the initial requirements for job-entry in office occupations. They are:

(1) High-school diploma (most common) (Downey, 1967).
(2) Previous experience (Kersten, 1967).
(3) Good general education (Noodell, 1967).
(4) Social graces (Letho, 1966).
(5) Human relations (Lovern, 1967).
(6) Ability to concentrate on one's work (Lovern, 1967).

If these surveys have any validity, they are good indicators of what employers weigh as important in job interviews. What they weigh seems not to fall in any overall category of standards. How they weigh each factor seems not to fall into simple numerical ratio, such as $x$ units of experience to $y$ number of high grades.

One major problem in trying to use industry standards in an educational context is that they are ambiguous and different. They are ambiguous because businessmen are evaluating a total person—his personality, his background, his flexibility and learning potential—to see whether he can fit in within the organization. They differ because businessmen place different weights on various factors. Some may feel that their organization needs people with a great deal of experience, others that a person with limited experience can adapt better to their organizational procedures. The questions, the tests, and the interview are, in a way, probes to get a quick and inexpensive portrait of the applicant, according to the goals of the business.

Thus, another problem emerges: Industry standards for job entry are the result of goals that are entirely different from educational goals. Industry has chosen certain standards by which to assess applicants in a quick and efficient manner. Education has established another set of standards to assess students: grades, homework, test performance, courses taken. These differing purposes, at least from the job-entry standpoint, prevent the direct translation of industry standards into educational ones.

### Standards Used for Job Performance

Another source of instructional standards is the standards businessmen require for performance on the job. A composite of these standards could be valuable to instructors, since students could be trained to perform according to the standards they will face in the "real world." Various surveys have in fact attempted to collect these standards. Let us look at the results of this labor.

Three hundred office workers and supervisors were interviewed in the Los Angeles area. Frequency of job tasks was computed, and the criterion level of performance was identified as well (Erickson, 1971).

The largest group of tasks fell under "Communicating with Others."

Standards:

1. Knowledge of job, personnel, and department functions.
2. Ability to make screening decisions.
3. Pleasant personality.
4. Tact, courtesy, and the ability to remain calm.
5. The ability to record meaningful messages.

The next largest group of tasks was "Sorting, Filing, and Retrieving."

Standards:

1. Ability to organize time and work tasks.
2. Accuracy.
3. Meeting deadlines and adhering to work schedules.
4. Ability to scan and distinguish names, number, and colors.

The third group of tasks was "Typewriting."

Standards:

1. Accuracy rather than speed.
2. Good proofreading skills.
3. Speed of 50-60 words per minute. (The actual production rates were observed to be much lower.)
4. Ability to cope with pressure of time, to complete multiple tasks, and work with many interruptions.

These three largest groups of reported job tasks are enough to furnish an idea of commonly accepted office standards. Similar standards are given in a report of clerical job profiles (Santa Clara County Office of Education, 1971). Previous researchers reported similar general office standards (Noodell, 1967; Lindseth, 1968; Lanham, *et al.*, 1968).

Again, there are problems with using such standards to design instruction. The most obvious one is the extremely low level of definition of standards. Office workers, for example, are expected to be accurate. But what defines accuracy? Is one error acceptable? How often can a worker make errors and his work be rated accurate? The same series of questions might be asked of the standards of *pleasant* personality, *good* proofreading skills, *tact* and *courtesy*. We do not know what defines pleasantness, goodness, tact and courtesy. If standards are to be borrowed from industry, more specificity is needed.

A related problem is that standards differ from one office to another. While businessmen in general may agree that accuracy is important, what one defines as accurate might be totally different from his neighbor. One office might insist on work that is totally error-free and institute a system of procedures to ensure such work. Another office may permit some minimal percentage of error, have few ways of checking errors, and rely on individual responsibility. Pleasantness in one office might be labeled saccharin in the next. The ability to cope might be veiwed as creative in one firm, and in another be viewed as "unwarranted seizure of executive prerogative."

Still another problem is buried beneath the obvious. Suppose that the ideal survey had been made. Teams had been sent to do a task analysis of all office jobs. They had gathered actual performance standards, explicit and implicit, in all kinds of offices. They had synthesized these data and provided us with a detailed, highly specific list of standards for all office tasks. How valuable would this collection be?

Essentially, what we would have would be the prevailing standards that the majority of businesses now use. We would be locked into the present and to the majority. The hazards have been stated somewhat melodramatically, but the point is well made:

> "Progress comes from the minority and sometimes just from individuals. Years ago our business writing in the office was done by pen and ink, and many people laughed about the use of the typewriter, but the minority use of the typewriter has now become the majority use. Years ago most businessmen kept their records by the single-entry method, but today most business concerns use the double-entry method . . . " (Lomax and Wilson, 1962, p. 14)

Standards shift, as do office procedures and skills. Since instruction has its result in the future, if we apply standards that presently prevail students may be ill-equipped for later work.

It is evident that industry standards have liabilities as well as assets for instructional use. They can be used as markers to see whether the educational system is in harmony with standards in common use; they can be adapted for instructional purposes to make students face requirements that they will soon work under. But their liabilities limit their usefulness in education. They are seldom stated precisely and operationally, actual use of standards is widely variant from one office to another, and exclusive use of prevailing standards may harm rather than help students in future work.

### Using Industry Standards in Instruction

Instructors have to make two decisions if they are to incorporate industry standards in an instructional system. They must choose certain standards from the wide selection available from industry. Second, they must operationally define what is meant by accurate, neat, good, and so on.

Making these decisions has strong implications for instruction. Some standards industry has chosen in reality are desirable personal characteristics—such things as pleasant personality, tact and courtesy. In these cases, instruction has only these major roles: It can make students aware of rules and examples to follow and provide them with experience. How a student operates with these rules is an individual choice, because there are no exact social templates for tact, courtesy and pleasantness. Therefore, for the group of industry standards listing desirable traits, students need experience and a chance to be evaluated under these standards.

Some industry standards are allied with distinct skills—typing, operating business machines, and filing. Unfortunately, standards are phrased as "accurate typing," "good filing skills." These standards need to be spelled out in some detail for use in instruction. When is a typed letter neat and accurate? How does a student demonstrate proficiency in operating a business machine?

In making these decisions, instructors are converting industry standards into something that is usable in a training environment. From the review of literature, it is clear that a body of standards does not exist in industry that is directly usable for instruction—they have to be adapted, and there is no way to avoid the problems of choice and operational definition.

It should also be clear that even to bring educational standards closer to industry standards requires a major change in evaluation. The philosophy of assigning grades does not fit. If industry requires a neat, mailable letter, it does not want an approximation. Rating a letter a student produces on a continuum of grades is at odds with office convention. A letter is either "A" or "F" in an office. If it is not acceptable, the usual practice is to correct it or retype it so that it becomes an "A" product.

Requiring students to show mastery is the sound alternative to grading in this business education context. In this way, they will learn to meet certain standards of performance that they will face on the job. They will learn that errors have to be corrected and that only a product meeting the standards is acceptable.

## HOW WE USED INDUSTRY STANDARDS

We classified industry standards into three groups: standards relating to personal characteristics, to office products, and to office procedures.

1. Personal characteristic standards

Ratings in this category are subjective—the evaluation of one person by another on a set of personal dimensions: tact, courtesy, and other social graces deemed desirable. We based our standards on commonly circulated models of business deportment and then created rating checklists. As in industry, the ratings are done by other people in several contexts: the job interview, telephoning, handwriting, greeting visitors.

For example, "a good handwriting" is often listed as an important asset. We translated "good" into "clear and readable" and made the standard read: "If three people can read what was written, then the writing is judged clear and readable." We did this in preference to adopting one model of handwriting style and imposing that standard on all students.

Similar standards were stated for business communication. Three judges would listen to the way a student handled an incoming caller and rate him on the dimensions of

courtesy and pleasant voice. The job interview, a recurring experience in our system, functions in the same way. The standards used are ones commonly listed and the rating is done by a teacher or, if possible, by a businessman.

The student is rated pass or fail under these standards as in all others that we use. If he is found lacking, he is given a critique, additional experience, and repeated chances to meet the standards.

2. Office product standards

A very large percentage of office activities are devoted to the preparation of products: completed forms, letters, reports, stencils, machine-duplicated copies, charts. For these activities we prepared standards that described the product that must be achieved.

In order to prepare these standards, we needed to define with exactitude what was an acceptable product. Again, we turned to commonly accepted models and laid out the standards implied by them.

For example, what makes a letter a mailable one? To answer the question, we needed to develop a whole list of specifications: Format—what formats are commonly used for business letters? Placement—how is the letter centered, placed, and aligned on the paper? Grammar and punctuation, erasures, strike-overs, impressions—all had to be described in terms of standards.

The final result was this standard for a mailable letter:

1. Letters are typed in the specified format—full or modified block.
2. Letters are correctly centered, aligned and placed on the page.
3. The content of the letters must be identical to the source document.
4. There can be no misspelled words and no typographical, grammatical and punctuation errors.
5. There can be no smudges, strike-overs, messy erasures or corrections.
6. All impressions must be clear, distinct and even.

The product specifications were not original but represented a combination of sources: examples from business offices, models from various business guides or supplied by teachers of business education. In short, these standards are a synthesis.

No doubt, fault could be found on either side—not enough or too much specification. We realize that adjustments might be necessary, based on new information and local requirements. The model allows this to be done. The importance lies not in the specifics but in the approach. Industry uses standards regulating the quality of products. Business education can mirror industry by using a similar approach, but gaps will remain because there will always be variation in office standards.

3. Office procedure standards

In other office activities, how someone does something may be important: how the telephone is answered; how money is handled when operating a cash register; how letters are put in a file. For these activities, we needed standards that check how something is done.

Telephone skills provide an example. Many offices require certain information to be given to a caller. The person answering generally has to give the name of the office, his name, and his department. There generally are procedures for writing down telephone messages and placing long-distance calls.

Standards took this final shape for answering telephone calls:

1. The incoming call must be answered promptly, that is, within three rings.
2. Correct identification is required of the person answering the calls. Correct identification includes:
   a. if the call comes through an office switchboard, the name of the person answering and his office or department,

b. if the call comes on an outside line, name of the company or organization, name of the person answering and his office or department.

The emphasis was different for these standards than for the other two groups of standards. In this case, we specified in detail how something should be done, to see whether the student performed certain important steps. The student was rated on the way he did something, rather than on the product he achieved.

The same criticism might arise with these standards as with the office product ones. Procedures vary from one office to the next and only one set has been selected for instructional standards. We had to choose, because we could not do otherwise. It would be meaningless to try to collect every possible variation in procedural standards and rate students under them. Learning the approach is more important than the specifics. Students can later learn, while on the job, the procedures chosen in that particular office. The importance for instruction is to rate students by ways they will confront in the future. The format in which our standards are placed makes it easy to modify them on the basis of local conditions or practices.

## THE PACKAGING OF THE CURRICULUM

The main conditions were now met for final preparation of the instructional materials. The office skills had been selected and coalesced under 17 jobs; the terminal objectives had been written; it remained to assemble the operational packets and the job practice materials.

1. Operational Packets

We now prepared packets of materials in order to make the utilization of the model possible. Since instruction was arranged around preparation for the performance of jobs, we organized the operational packets around them.

For each job[1] a packet was prepared showing how the job was to be set up, its relation to other jobs, and the flow of work to and from the job. The materials included:

a. *Master matrix*, showing the situation of the job in the career ladder, and the skill areas required to perform the job (Figure 3).
b. *Sub-matrices*, one for each skill area required, indicating the specific skills required on the job in each area (Figure 4).
c. *Flow chart*, outlining how inputs and outputs flow to and from the job to other jobs.
d. *Supervisor's guide*, describing how the job is to be set up, work flow, and surrogate functions.
e. *Materials and equipment list*, listing the materials and equipment required for the performance of the job, (e.g., documents to file, dictation to transcribe, typewriter).

The packets also included materials specifying the tasks to be performed on the job:

f. *Task analysis*, listing the tasks comprising the job.
g. *Behavioral objectives*, outlining the conditions and standards under which the job tasks must be performed.
h. *Performance tests*, procedural checklists for the performance of the job tasks.

[1] The only exception was the filing sequence of jobs. Because they were so interrelated, only one package was prepared for the three.

General Matrix, by Skill Areas and Job Titles

| Job Title | DOT Number | Skill Areas: Office Machines | Filing | Office Procedures | Typing/Transcription Shorthand | Accounting |
|---|---|---|---|---|---|---|
| Duplicating Machine Operator | 207.782 | X | | X | | |
| File Clerk I | 206.388 | X | X | | | |
| File Clerk II | 206.388 | X | X | X | | |
| File Clerk III | 206.388 | X | X | X | X | |
| General Office Clerk I | 219.388 | X | X | X | X | |
| Cashier | 211.368 | X | | | | X |
| General Office Clerk II | 219.388 | X | X | X | X | X |
| Receptionist I | 237.368 | | X | X | X | X |
| Receptionist II | 237.368 | X | X | X | X | X |
| Typist | 203.588 | X | | | X | |
| Clerk Typist | 209.388 | | X | X | X | |
| Bookkeeping Clerk | 210.388 | X | | X | X | X |
| Bookkeeper | 210.388 | X | | X | X | X |
| Junior Accountant | 160.188 | X | | X | X | X |
| Stenographer | 202.388 | X | | X | X | X |
| Secretary | 201.368 | X | X | X | X | |
| Executive Secretary | 169.168 | X | X | X | X | X |

Figure 3

In addition, operational materials were provided for peer instructors and the job application procedure:

i. *Job Performer/Instructor's guides*, brief memory aids listing the tasks that must be taught to the trainee, plus procedural steps to facilitate instruction.

j. *Job description*, a "recruitment" document stating for the benefit of a potential applicant the nature of the job and any prerequisites.

k. *Job placement tests*, for use in the job application procedure, to see whether the applicant has the skills necessary to perform the job.

As with the other materials this project generated, the packets were sent for review to the California Bureau of Business Education, the Research Coordinating Unit, and the Career-Education Task Force. The packets constitute a research product and are not included with this report. They have been provided to the sponsoring agency for final review and disposition.

Sample Sub-Matrix: Filing Skill Area

| Job Title | Skills: Files Coded Material (According to A, N, & C Systems) | Retrieves Filed Material (According to A, N, & C Systems) | Files Coded Material (According to A, N, C, S, G, SU Systems) | Retrieves Coded Material (According to A, N, C, S, G, SU Systems) | Purges Files (A, N, C, SG, SU Systems) | Abstracts Data From Files (A, N, C, S, G, SU Systems) | Codes Incoming Material (According to A, NC, SG, SU Systems) | Fills Out Cross Reference Forms (A, N, C, S, G, SU Systems) | Makes New File Folders (A, N, C, S, G, SU Systems) | Sets Up Filing Systems (A, N, C, S, G, SU Systems) |
|---|---|---|---|---|---|---|---|---|---|---|
| File Clerk I | X | X | | | | | | | | |
| File Clerk II | X | X | X | X | X | X | | | | |
| File Clerk III | X | X | X | X | X | X | X | X | X | X |
| General Office Clerk I | X | X | X | X | X | X | | | | |
| General Office Clerk II | X | X | X | X | X | X | | | | |
| Receptionist I | X | X | | | | | | | | |
| Receptionist II | X | X | | | | | | | | |
| Clerk Typist | X | X | X | X | X | X | X | X | X | X |
| Secretary | X | X | X | X | X | X | X | X | X | X |
| Executive Secretary | X | X | X | X | X | X | X | X | X | X |

A = Alphabetic
N = Numeric
C = Chronological
S = Subject
G = Geographic
SU = Suspense

Figure 4

2. Job Materials

It was beyond the scope of the present project to create and gather the full complement of instructional materials needed for implementation of the entire model. By itself, that undertaking would demand additional amounts of time and money. Instructional materials, however, were gathered for the pilot test. (The nature and results of the pilot test are described in the next section.)

Because the packets prescribe the generic tasks to be performed in each job, the types of materials needed can be easily derived from them. Some specific examples describe how this can be done:

*Filing materials.* The chief function of the filing jobs is to place materials in files and take them out, when needed. Specific tasks are assigned to specific jobs: File Clerk III codes documents, File Clerk I places them in the proper location in the files. The job materials needed are:

- Various documents to code, indicating under what entry the document is to be filed (File Clerk III's task)
- Coded documents to place in the files (File Clerk I)
- File folders prepared, if there are none for these documents (File Clerk III)
- Filing cabinet

*Typing materials.* Because typing tasks grow more complex as the student proceeds up the career ladder, a wide variety of things to type are necessary:

- Forms, envelopes, statements, invoices, fill-ins of form letters
- Edited typewritten drafts

- Handwritten unedited drafts
- Charts, both handwritten and edited drafts
- Stencils
- Transcription tapes

The procedure should be clear from these examples. To prepare job materials from the packets:

(1) For each job, examine the task analysis, behavioral objectives, and performance tests. These items describe in detail what tasks the student is to perform on the job. The behavioral objectives describe what kinds of inputs the student is to receive, what he must do, and what standards he or his product must meet for each task.

(2) Create or gather the inputs the student needs for performance of the tasks—a handwritten draft, a telephone message pad, a coded document for filing, etc.

Materials can be used for several purposes. A letter prepared by a typist can also serve as a document for the Filing Clerk III to code and the Filing Clerk I to file. The flow chart, materials, and equipment list provide guidelines on how products might move from job to job and what basic equipment and materials are needed.

When we prepared materials for pilot-testing seven jobs, we found that, since we organized jobs around the prevalent industry model, local business concerns were enthusiastic in furnishing us with job materials. They gave us handwritten drafts of letters, a complete array of filing materials, forms they commonly used, blank stationery, transcriptions of meetings. The students also responded well to the fact that they were working with "real" materials; they reported that it was interesting to type on "real" stationery, file letters from firms they knew, and transcribe the minutes of the local Antipoverty Council meetings.

During the pilot test, we also found that the rate at which students worked with materials was far greater than we had anticipated. They filed materials more quickly; they typed letters and transcribed more quickly. In short, their rate of production was double and often triple what our estimates had projected.

The pilot test gave us sufficient experience to add new and important considerations to the preparation of job materials:

(1) If possible, job materials should be gathered from local business concerns—they add a degree of reality to the tasks students perform and enhance student interest in the tasks.

(2) Materials need to be structured so that they include typical problems that students might confront in a real job. For example, students should have experience in filing hyphenated names, numerical names, and names of federal and state agencies. In large part, the problems students should confront are outlined in the operational packets. When job materials are prepared, a cross-check should be made to make certain that students are exposed to problems similar to those they might later encounter.

(3) Job materials should be accumulated in great quantity. Under this model, students work at rates far more productive than are usually found in the classroom.

## PILOT TEST OF THE MODEL

Before the pilot test of instructional modules is described, a word must be addressed to the design constraints imposed upon the project effort. One of the primary objectives of the research was to design a formalized job instructional model. Four kinds of data

will be presented on the pilot test of the instructional model: data on the development and refinement of the instructional system; comparative performance data for experimental students; attitude data from experimental students; and, in addition, data relative to the design and management of the instructional system itself. Data will also be presented which were collected through an experimental-control research design. These data should be regarded only as trend indicators rather than as a formal evaluation of the model. A formal evaluation is only possible through a full-scale implementation. A second requirement of the project was to provide a detailed plan for implementation and formal evaluation of the instructional model. This plan is included as the final section of this report. As part of this plan, a formal, evaluative research design—including the appropriate experimental-control comparisons—is presented.

## GENERAL POPULATION CHARACTERISTICS

Before any experimental processes were introduced, a survey instrument was administered to the total office education student population of Pacific Grove High School (N=200). The results of the survey indicated that the demographic characteristics of the total population were as follows:

| | | |
|---|---|---|
| 29% male | — | Of these, 20% planned a career in business; 50% did not; 30% didn't know |
| 71% female | — | Of these, 39% planned a career in business; 30% did not; 31% didn't know |
| Ethnic group | — | 87% White<br>2% Black<br>4% Oriental<br>2% Mexican-American<br>5% Other |
| Mean age | — | 15.8 years |

General population attitudes were determined on the following dimensions: self-concept; attitude toward work and education in general; attitude toward office education courses; attitude toward peer instruction. Sample items and frequency distributions of responses are presented for each dimension in the tables accompanying the following descriptive sections.

Self-Concept (7 items). While they cared about other people's opinions of them they exhibited some confidence about their ability to take on the responsibility for getting something done either by figuring out the job themselves or—more important—by seeking outside help. (See Table 1.)

Attitude Toward Work and Education in General (26 items). General attitudes toward education were very positive—the students liked being in high school, thought they had been graded fairly, cared about getting their schoolwork done and done well, got along "OK" with their teachers, and planned to finish high school and go on to college (67%). (Nevertheless, 99% of the students reported that they were either "sometimes" or "often" bored by their classes.) Most of the students exhibited similar positive attitudes about work and working at jobs. (See Table 2.)

Table 1

## Self-Concept: Sample Items and Frequency Distributions of Responses

| Sample Items | Frequency Distributions of Responses |
|---|---|
| 23. Does it make a difference to you, how people feel about you? | |
| Usually | 115 |
| Sometimes | 51 |
| Hardly ever | 20 |
| 34. How much does it matter to you how other kids feel about you? | |
| It matters a lot | 74 |
| Sometimes it matters | 84 |
| It doesn't matter much | 23 |
| 42. How do you think you do when you are put in charge of getting something done? | |
| I think I do a good job | 78 |
| I think I do all right | 100 |
| I don't think I do very well | 4 |
| 58. What do you do when you don't know how to get a job done? | |
| I figure it out myself | 36 |
| I get help from somebody else | 140 |
| I give up | 0 |
| 64. Does it make you feel good when you finish a job you have to do? | |
| Almost always | 148 |
| Sometimes | 32 |
| Hardly ever | 3 |

Table 2

## Attitude Toward Work and Education in General: Sample Items and Frequency Distributions of Responses

| Sample Items | Frequency Distributions of Responses |
|---|---|
| 18. Do you find ways to get out of doing work? | |
| Usually | 7 |
| Sometimes | 103 |
| Hardly ever | 73 |

*(Continued)*

Table 2 *(Continued)*

## Attitude Toward Work and Education in General: Sample Items and Frequency Distributions of Responses

| Sample Items | Frequency Distributions of Responses |
|---|---|
| 31. Even if a job is dull and boring, will you stick to it until it's finished? | |
| Usually | 118 |
| Sometimes | 52 |
| Hardly ever | 12 |
| 47. How often do you finish things you start? | |
| Often | 145 |
| Sometimes | 33 |
| Not very often | 3 |
| 61. Does it really matter to you if you do a good job or not? | |
| Usually | 148 |
| Sometimes | 28 |
| Hardly ever | 5 |
| 30. Do you like being in high school? | |
| Yes | 133 |
| I don't care | 24 |
| No | 24 |
| 38. Do you think teachers have graded you fairly? | |
| Mostly | 129 |
| Sometimes | 52 |
| Hardly ever | 1 |
| 16. Does it matter to you if you get your schoolwork done on time? | |
| It matters a lot | 109 |
| Sometimes it matters | 70 |
| It doesn't matter | 3 |
| 63. How much does it matter to you whether you do your schoolwork well or not? | |
| It matters a lot to me | 123 |
| Sometimes it matters to me | 59 |
| It doesn't matter to me | 0 |

*(Continued)*

Table 2 *(Continued)*

**Attitude Toward Work and Education in General: Sample Items and Frequency Distributions of Responses**

| | Sample Items | Frequency Distributions of Responses |
|---|---|---|
| 36. | How well do you get along with your teachers? | |
| | Very well | 86 |
| | Get along OK | 93 |
| | Don't get along | 2 |
| 72. | Do you plan to finish high school? | |
| | Yes | 180 |
| | Not sure | 3 |
| | No | 0 |
| 40. | How often are you bored by your classes? | |
| | I am never bored | 2 |
| | Sometimes I am bored | 137 |
| | I am often bored | 44 |
| 45. | What do you plan to do after high school? | |
| | Not sure | 21 |
| | Vocational or technical school | 4 |
| | College | 124 |
| | Military service | 7 |
| | Get a job | 25 |
| | Other | 4 |

Attitude Toward Office Education Courses (12 items). Most of the students felt that their office education courses would be of at least some practical value to them in their future job plans (92%) or in future schooling (96%). Attitude toward these courses was generally favorable, although 48% reported that they hardly ever received feedback from the teachers and 26% reported that they hardly ever received individual help (60% reported receiving individual help only "sometimes"). "Some" or "a lot" of wasted time was reported by 49%. (See Table 3.)

Attitude Toward Peer Instruction (8 items). Most students indicated that they preferred working with other people and that they were not reluctant to seek or receive help with their work. They were, however, not sure they would like being taught business education skills by other students (59%), nor were they confident that they could teach these skills to others (58%). (See Table 4.)

Table 3

## Attitude Toward Office Education Courses: Sample Items and Frequency Distributions of Responses

| Sample Items | Frequency Distributions of Responses |
|---|---|
| 37. Do you feel the business education course(s) you have taken or are now taking will be of practical value to you in your future job plans? | |
| Much practical value | 91 |
| Some practical value | 78 |
| Little practical value | 13 |
| 44. If you go on in school do you think the business education course(s) you have taken or are now taking will be of value? | |
| Much value | 103 |
| Some value | 73 |
| Little value | 7 |
| 51. How often do you feel time was wasted during the business education course(s) you have taken or are now taking? | |
| I don't think time was wasted | 93 |
| Some time was wasted | 75 |
| A lot of time was wasted | 15 |
| 69. How often have you received individual help during your business education course(s)? | |
| Very often | 26 |
| Sometimes | 108 |
| Hardly ever | 47 |
| 70. How often does your teacher tell you how you are progressing in your business education course(s)? | |
| Often enough | 27 |
| Sometimes | 66 |
| Hardly ever | 88 |
| 49. Is there enough time to practice the skill(s) you are required to learn in your business education course(s)? | |
| There is enough practice time | 73 |
| Sometimes there is enough practice time | 86 |
| Usually there is not enough practice time | 24 |
| 62. Do you like your business education course(s) as much as your other courses? | |
| I like them a lot more | 36 |
| I like them about as much | 112 |
| I don't like them as much | 35 |

Table 4

**Attitude Toward Peer Instruction: Sample Items and Frequency Distributions of Responses**

| Sample Items | Frequency Distributions of Responses |
|---|---|
| 41. Do you find it easy to ask others for help? | |
| Easy | 67 |
| Somewhat easy | 93 |
| Not easy | 23 |
| 24. Does it bother you when other people offer to help you with work? | |
| Hardly ever | 112 |
| Sometimes | 62 |
| Usually | 5 |
| 53. How do you think you would feel about being taught business education skills by other students who have already learned the skills? | |
| I think I would like it | 74 |
| I am not sure if I would like it | 89 |
| I don't think I would like it | 19 |
| 59. Do you think you could teach other students the skill(s) you have learned in your business education course(s)? | |
| Yes, I could teach other students the skill(s) | 77 |
| I am not sure if I could teach other students the skill(s) | 87 |
| No, I could not teach other students the skill(s) | 19 |
| 76. Would you rather do things by yourself or with other people? | |
| Usually by myself | 26 |
| Usually with other people | 102 |
| It doesn't matter | 51 |

## PILOT TEST STUDENT POPULATION AND PROCEDURE

One of the constraints, over which we had no control, was the continuance of the regular daily class schedule. Under more advantageous circumstances, we would have selected a sample of students who would have been released from all other classroom obligations to work in the pilot program. In practical terms, of course, this was not possible. We therefore had students available to the program for only one, or at most three, class periods per day—that is, the class period(s) in which they would normally have had office or business education classes.

Since we needed as many students as possible at as many job levels as possible in each class period, this limitation posed some difficulty. In order to accelerate the selection process, we simply asked students in each class period to sign up for (a) a job they felt they could do, and (b) a job they wanted to learn. Job descriptions were available to the students so that they could select from the jobs available, which were:

Duplicating Machine Operator (DMO)
File Clerk I
File Clerk II
File Clerk III
Typist
Clerk Typist
Secretary

These seven job modules were selected for the pilot test because they met two criteria: (a) they offered a wide range of skill levels, and (b) four of the jobs offered had minimal entry-level requirements, which made them suitable as entry points into the system for greater numbers of students.

From the signup sheets, the first input of experimental program students was selected for each class period, with some attempt being made to select a spread of types of jobs. This first input was made up of 13 students, arranged by class period and job as follows:

| Class Period | Job Stations Opened |
|---|---|
| 1 | 2 File Clerks III |
| 1 | 1 Secretary |
| 2 | 1 Secretary |
| 2 | 1 File Clerk I |
| 3 | (2 Secretaries) (Same as periods 1 and 2) |
| 3 | 1 Typist |
| 3 | 1 File Clerk I |
| 4 | (1 Secretary) (Same as period 1) |
| 5 | 1 Duplicating Machine Operator |
| 5 | 1 File Clerk II |
| 5 | 1 Typist |
| 5 | 1 Typist |
| 7 | 1 File Clerk II |
| 7 | 1 File Clerk III |

The second input of experimental program students was selected on the bases of class period, job they could do, and job for which they could be trained by students in the first input. There were 11 students in this input, arranged by class period and job as follows:

| Class Period | Job to be Performed |
|---|---|
| 1 | 1 File Clerk I |
| 1 | 1 File Clerk II |
| 2 | 1 File Clerk I |
| 3 | 1 Typist |
| 3 | 1 File Clerk II |
| 3 | 1 Clerk Typist |

| Class Period | Job to be Performed |
|---|---|
| 4 | 1 File Clerk I |
| 4 | 2 Typists |
| 5 | 1 File Clerk I |
| 7 | 1 File Clerk I |

The third and final input of experimental program students was selected on the bases of class period and job they could be taught to do by students in either the first or second inputs. In other words, the 11 students in the third input were used only as trainees in order to provide teaching experience for students in the first and second inputs.

The final scheme of who was assigned to do what and teach whom over all three inputs is presented in Table 5. It should be noted that for two job performers no students were available during their class times to be assigned as trainees. These two students experienced job practice and higher-job training only.

For each experimental program student, a comparison student from the conventional program was selected on the basis of matching on the following dimensions:

(1) Kind and amount of previous office education: 94% exact E-C matches
(2) Age: E Mean = 16.0; C Mean = 15.9
(3) Grade level: E Mean = 10.6; C Mean = 10.6
(4) Sex: Exact E-C matches

Grade point and aptitude test score data were collected for all experimental and comparison students. However, because of variations in aptitude test instruments and the non-representative method of determining grade point averages, these data were set aside as being of questionable advantage to the study.[1]

## FINDINGS

### PRE - PILOT STUDY PERFORMANCE MEASURES

As part of their job application process at the beginning of the pilot study, all experimental program students were given the job placement tests appropriate to the job for which they were making application. These test procedures included a sampling of the job mastery tests plus a sampling of industry placement tests (such as timed typing and shorthand tests). Each student's control counterpart was given the same sampling of tests. Of the experimental group, 77% passed the job placement tests, while 75% of the control group passed. Those experimental group students who failed their job placement tests were "hired" into the jobs as on-the-job trainees and all but one student had mastered all of the job skills before the end of the pilot tests.

It was not possible to test the students on parallel instruction in the conventional system since, for most of the job skills taught and tested in the experimental system, there was no parallel instruction in the conventional system and, therefore, no tests to measure these skills. For example, while the experimental system teaches the typing of transmittable *products*, the conventional system only measures typing speed and accuracy in timed writings. These kinds of tests were included in the job placement tests. For filing, however, the conventional system uses a paper-and-pencil measure, while the experimental system uses an actual filing *performance* test.

[1] In computing grade point averages at this school, all grades of "F" are dropped, so that one student might achieve a GPA of 3.3 on the basis of one "A," two "Bs" and three "Fs."

Table 5

## Student Assignments and Functions

| Student Name | Present Job and Date "Hired" | Acting as JPI for: (student) | Job Being Studied and Name of JPI |
|---|---|---|---|
| Pena | FC III 5/11/72 | Melton | Typist/Weaklend |
| Field | FC III 5/11/72 | J. Davidson | Typist/Weaklend |
| Weaklend | Secretary 5/11/72 | Pena; Field; Higbie; Houghton; Morrow | Exec. Secretary-Surrogate |
| Bruno | Secretary 5/11/72 | King; Hickman; Strouse; Bispo | Exec. Secretary-Surrogate |
| Bispo | FC I 5/11/72 | Simon | DMO and FC II/Bruno |
| Jan King | Typist 5/11/72 | Wayland | Clerk Typist/Bruno |
| Wayland | FC I 5/11/72 | Casas | FC II/King |
| Fisher | FC II 5/11/72 | McClay | FC III/Light |
| Light | Typist 5/11/72 | Fisher; May; Vanderpool | Clerk Typist-Surrogate |
| Montgomery | FC II 5/11/72 | O'Donnell | FC III/Houlihan |
| Houlihan | FC III 5/11/72 | Montgomery | Typist-Surrogate |
| Vanderpool | DMO-FC I 5/12/72 | Earl Davis | FC II/Light |
| May | Typist 5/12/72 | Kuznitz | Clerk Typist/Light |
| Higbie | Typist 5/12/72 | [a] | Clerk Typist/Weaklend |
| Melton | FC I 5/12/72 | Pearson | FC II/Pena |
| J. Davidson | FC II 5/12/72 | Ciandro | FC III/Field |
| Strouse | FC I 5/12/72 | Duncan | DMO-FC II/Bruno |
| Houghton | FC II 5/12/72 | Dowell | FC III/Weaklend |
| Hickman | Clerk Typist 5/12/72 | Hazdovac | Secretary/Bruno |
| Gerber | FC I 5/12/72 | [a] | FC II/Devincenzi |
| R. Devincenzi | Typist 5/12/72 | Gerber | Clerk Typist/Morrow |
| Morrow | Typist 5/12/72 | R. Devincenzi | Clerk Typist/Weaklend |
| McClay | FC I 5/12/72 | Wilson | FC II/Fisher |
| O'Donnell | FC I 5/12/72 | Pliska | FC II/Montgomery |
| Simon | --- | --- | FC I/Bispo |
| Casas | --- | --- | FC I/Fisher |
| Davis | --- | --- | DMO-FC I/Vanderpool |
| Kuznitz | --- | --- | Typist/May |
| Pearson | --- | --- | FC I/Melton |
| Ciandro | --- | --- | FC II/Davidson |
| Duncan | --- | --- | FC I/Strouse |
| Dowell | --- | --- | FC II/Houghton |
| Hazdovac | --- | --- | Clerk Typist/Hickman |
| Wilson | --- | --- | FC I/McClay |
| Pliska | --- | --- | FC I/O'Donnell |

[a]No students available during this class time to be assigned as learners.

An attempt was made to administer the paper-and-pencil filing test to all experimental and control students. Unfortunately, at the time this test was to be administered, teachers were constrained by various other requirements—giving job placement tests, interviewing job applicants, and trying to operate their conventional classes. As a result of this inordinate pressure, very few of the control students took the test; their mean error rate was 6.75. For the experimental students, the mean error rate was 8.75. The test contained 20 items, and 7 or more errors constituted a failure.

It should be noted here that in an evaluative study this time-pressured circumstance would not occur—the difficulty here being the concurrent operation of the pilot testing and of the conventional system. The constraints on time and management would not exist in a field test program in which the entire experimental system would be established. The phasing-in of the program would also take place more gradually, which would allow for extensive testing. A detailed presentation of an evaluation plan is included as the final section of this report, "Plan for Implementation and Evaluation."

## POST - PILOT STUDY PERFORMANCE MEASURES

As the students entered the experimental program, they worked at their job stations in lieu of going to their regular office education classes. The job stations were located in one of the three classrooms assigned to the Pacific Grove High School business department, and a conventionally conducted class was often operating in the same room. Students entered the program at different times, the time varying even within the three input waves.[1]

When the post-study tests were being administered, there was a high absentee rate, since the close of school was imminent and the U.S. Open Golf Tournament was under way, offering employment and unusual recreation to the students. For these reasons, our N of matched pairs diminished to 21. We have partial data for other pairs, but as in the case of the paper-and-pencil pretest, we prefer to deal only with complete cells.

The written test used was the same paper-and-pencil alphabetic filing test used in the pretest. The job-related performance tests were the criterion-referenced tests used for each job. An example of this kind of test is presented as Figure 5. The test is rated on a pass/fail basis, 100% mastery required, and the focus is on product rather than process.

Summary data of the findings are presented in Table 6. More detailed post-study data, by matched student pairs, are presented in Table 7.

The mean time, 14.3 hours, which was spent in the experimental program is approximately equivalent to three school weeks, one hour per day.[2] With such a brief exposure to the instructional model, it is impressive that so many of the students mastered the job-related skills. Of course, the entire time they were in the program they were working on the functional job context and taking tests that were job- and product-oriented. On this dimension the experimental students had an advantage over the control students on the post-study performance tests—the control students, unless they had outside jobs, were not exposed to many of the tasks and skills required by the tests.

Therefore, while we cannot generalize broadly from these data, the trend is clearly toward greater skill acquired more rapidly by the experimental students. It seems safe to speculate that over a school year the faster students might well progress up several rungs on the career ladder. In fact, one experimental student, in the span of only three weeks, progressed up to the level of the advanced job for which she was being trained, thereby becoming a JPI in the more advanced job.

[1] This fact, plus any absenteeism, is reflected in the variation in participation time in Table 7.

[2] The figure is slightly elevated because of one student who had two office education hours per day instead of one; the mean time spent in the program by the one-hour-per-day students was 13.5 hours.

## Sample Fixed-Criterion Test: Typist

Conditions: Normal job conditions

Given: Requests for typing of transmittable products of:
1 letter with two carbon copies
1 memorandum
1 form
1 reproduction master, *and one short report,* student will

Action: Type all requested documents, following procedures outlined below.

Standards: 100% accuracy
Time limit: 2 hours

| | Test No. 1 | | Test No. 2 | | Test No. 3 | |
|---|---|---|---|---|---|---|
| Procedures: | Pass | Fail | Pass | Fail | Pass | Fail |
| 1. General requirements: | | | | | | |
| Neat | | | | | | |
| Clear | | | | | | |
| Correct | | | | | | |
| Centered | | | | | | |
| Aligned | | | | | | |
| No errors or misspellings | | | | | | |
| Complete with all information | | | | | | |
| 2. General procedures: | | | | | | |
| a. Place paper and/or carbon sets in typewriter | | | | | | |
| b. Align papers | | | | | | |
| c. Set margins | | | | | | |
| d. Type content | | | | | | |
| 3. Letters/Memoranda | | | | | | |
| a. Format (block or modified) | | | | | | |
| b. Content: | | | | | | |
| Date | | | | | | |
| Addressee | | | | | | |
| Salutation | | | | | | |
| Text (complete & identical to source document) | | | | | | |
| Closing | | | | | | |
| Signature block | | | | | | |
| Notation of enclosures or carbon copies | | | | | | |
| 4. Forms: | | | | | | |
| a. Format (appropriate) | | | | | | |
| b. Content (complete & identical to source) | | | | | | |
| 5. Straight-copy reports: | | | | | | |
| a. Format (as instructed) | | | | | | |
| Headings | | | | | | |
| Page numbering | | | | | | |
| b. Content (complete & identical to source) | | | | | | |

Figure 5 *(Continued)*

## Sample Fixed-Criterion Test: Typist *(Cont.)*

| Procedures | Test No. 1 Pass | Test No. 1 Fail | Test No. 2 Pass | Test No. 2 Fail | Test No. 3 Pass | Test No. 3 Fail |
|---|---|---|---|---|---|---|
| 6. Reproduction masters: Prepare in accordance with: a. General requirements | | | | | | |
| b. Specific manufacturer's instruction: Typing pressure | | | | | | |
| Erasures or corrections | | | | | | |
| 7. Proofreading: a. With another person, read content | | | | | | |
| b. In proofreading alone, check word-for-word against original document | | | | | | |
| c. Make necessary corrections | | | | | | |
| d. If document retyped, check retyped material against source document | | | | | | |

Figure 5

Table 6

### Summary of Findings[a]

| Measure | Experimental | | Control | |
|---|---|---|---|---|
| Mean time in experimental system | 14.3 | | 0 | |
| | Pre | Post | Pre | Post |
| Mean errors in written test | 8.75 | 7.1* | 6.75 | 9.0* |
| % passing on performance test | 77% | 85.71% | 75% | 9.52% |
| | Number of Items Showing Pre-Post Change (36 Items) | | | |
| Student attitudes[b] | | | | |
| Positive shift | 21 | | | |
| No shift | 14 | | | |
| Negative shift | 1 | | | |

[a] *Indicates difference significant at the .05 level, as measured by a paired-*t* test with 20 *df*.

[b] Experimental students only.

Table 7

**Post - Pilot Study Performance Measures, by Student Pairs**

| Student Pair | Time Experimental Student was in Pilot Test (hrs) | Written Test Errors | | Job-related Performance Test | |
|---|---|---|---|---|---|
| | | E | C | E | C |
| 1 | 30[a] | –4 | –9 | Pass | Fail |
| 2 | 12 | –10 | –9 | Pass | Fail |
| 3 | 10 | –5 | –5 | Pass | Fail |
| 4 | 14 | –2 | –4 | Pass | Fail |
| 5 | 10 | –10 | –10 | Pass | Pass |
| 6 | 15 | –11 | –7 | Pass | Fail |
| 7 | 12 | –14 | –10 | Pass | Fail |
| 8 | 12 | –9 | –9 | Pass | Fail |
| 9 | 15 | –7 | –6 | Pass | Fail |
| 10 | 15 | –7 | –13 | Pass | Fail |
| 11 | 17 | –5 | –7 | Fail | Fail |
| 12 | 13 | –9 | –8 | Pass | Fail |
| 13 | 18 | –2 | –8 | Pass | Fail |
| 14 | 14 | –3 | –8 | Pass | Pass |
| 15 | 13 | –7 | –9 | Pass | Fail |
| 16 | 18 | –6 | –13 | Fail | Fail |
| 17 | 12 | –9 | –11 | Pass | Fail |
| 18 | 11 | –8 | –14 | Pass | Fail |
| 19 | 13 | –8 | –9 | Pass | Fail |
| 20 | 13 | –5 | –11 | Fail | Fail |
| 21 | 14 | –8 | –8 | Pass | Fail |

[a]This student was in two classes; therefore her time per day was two hours rather than one.

## PRE - PILOT, POST - PILOT ATTITUDE COMPARISONS

Of the 53 attitude items that appeared on the pre - pilot questionnaire, over half had been written to be suitable for use as post - pilot indices of student attitude. This subset of 36 items was selected for administration to the students who had been trained in one or more of the pilot experimental modules. The items were suitably rephrased to directly reflect the effects-upon-attitude of having participated in the experimental program, and they were assembled into a post-pilot questionnaire designed for oral administration.

### Procedure in Attitude Testing

A complete, four-cell E-C, pre-post design was not employed in gathering student attitude data. Experimental and control students were administered the pre-questionnaire, but only experimental students were administered the post-questionnaire. We did this to determine whether the experimentals and controls were alike in their attitudes fairly late in the school year, after approximately six months of conventional instruction. This proved to be the case, providing yet another index demonstrating the close comparability

of the experimental and control groups. We found no reason to assume that a continued and shorter (approximately three-month) period of exposure to more of the same conventional instruction would be likely to improve control group attitudes. Considering their expressed boredom, continued exposure to conventional instruction would produce no attitude change at all, or possibly cause a deterioration. We saw no need to demonstrate this. However, we did see a clear need to determine whether the experimental students showed attitude changes (positive or negative) as a result of participating in the experimental program. Hence, the experimental group underwent a post-administration of certain of the attitude items.

We cannot, therefore, draw broad implications from these attitude data. Any reported comparison of attitude between experimental and control groups should be interpreted with reservation, since there was no post-testing of the control group for comparative purposes.

To allow a maximum amount of time for the experimental modules to operate, data collection was delayed until the last week of the school term resulting in a three-month time interval between the pre- and post-administrations. One school day was devoted to administration of the post-questionnaire in which experimental students were interviewed during their regularly scheduled class periods. The students had not been forewarned that such a session was planned. Upon reporting to class that day, the teacher instructed the experimental students to, "Go with Dr. 'X' who wants to talk to you about the experimental program." Few of the students had seen "X" before, and very probably did not associate him with the project team. Thus, there was little opportunity for the students to "rehearse" or put together a preconceived mental set.

The experimental students present for each period accompanied the interviewer to a nearby conference room where they were interviewed as a group. The size of the group interviewed per session ranged from two to ten. The interviewer posed the questions serially, asking each student to indicate orally his or her response to that item. There seemed to be little "bandwagon effect" in that the students showed no hesitation in disagreeing with one another or in voicing why they responded as they did.

The decision to delay post-data collection until the last week of the term did maximize the amount of time each student spent in the experimental modules prior to post-interview, but it also significantly reduced the available N. The Pacific Grove High School maintains a fairly open campus and does not employ a rigid attendance policy. This, combined with the fact that a large number of students had jobs with the U.S. Open Golf Tournament during this week, reduced the number of experimental students available for interview from the original 35 to 23.

## Findings

To maintain pre-post comparability and precision of E-C match, the attitude data reflect the responses of these 23 experimental students and their 23 matched control students on the subset of 36 pre-questionnaire items, and the responses of the 23 experimental students on the same 36, rephrased post-questionnaire items.

It is important in the development and pilot testing of instructional innovations that programs not be introduced that cause student attitude and motivation to deteriorate. If student attitudes toward instruction, self, and so on are already positive, we would want a particular instructional innovation to maintain that positiveness; if attitudes are neutral or negative, we would want the innovation to facilitate attitude change in a positive direction. Examination of the frequency distributions of these attitude data disclosed that the experimental and control groups were closely matched, and on most items practically identical in their pre-administration responses (see Tables 8-11). On their post-administration responses, the experimental students showed a slight deterioration on one item, no change on 14 items, and facilitation on 21 items for a net positive shift in

attitude. Tables 8, 9, 10, and 11 present the data for selected items which exemplify the trends found in each of the four general categories. The frequency distributions of the responses of the matched experimental and control groups on the pre-administration, and the responses by the experimental students to the rephrased items on the post-administration, are presented.

Self-Concept. Of the seven self-concept items pre-administered to the entire population of office education students, three were considered suitable for rephrasing for post-administration to the experimental students. (See items 42, 58, and 64 in Table 8.)

Table 8

**Self-Concept: Response Data**

| Pre - Pilot Test | | | Post - Pilot Test | |
|---|---|---|---|---|
| Item | C | E | Item | E |
| 42. How do you think you do when you are put in charge of getting something done? | | | How do you think you did when you were put in charge . . . in the experimental program? | |
| 1. I think I do a good job | 10 | 9 | 1. | 11 |
| 2. I think I do all right | 12 | 14 | 2. | 12 |
| 3. I don't think I do very well | 1 | 0 | 3. | 0 |
| 58. What do you do when you don't know how to get a job done? | | | What did you do when you didn't know how to get a job done . . . experimental program? | |
| 1. I figure it out myself | 6 | 4 | 1. | 2 |
| 2. I get help from somebody else | 17 | 19 | 2. | 21 |
| 3. I give up | 0 | 0 | 3. | 0 |
| 64. Does it make you feel good when you finish a job you have to do? | | | Did it make you feel good when you finished a job you had to do in the experimental program? | |
| 1. Almost always | 16 | 17 | 1. | 18 |
| 2. Sometimes | 6 | 5 | 2. | 5 |
| 3. Hardly ever | 1 | 1 | 3. | 0 |

It is evident that the distributions of responses on each of these three items were essentially the same. The experimental students responded the same as the control students did prior to entering the experimental program and did not change their responses to any extent as a result of their experiences in the program.

Attitude Toward Work and Education in General. Of the 26 items in this category pre-administered to the population of office education students, 14 were considered suitable for post-administration to the experimental students. Seven are presented here to exemplify trends. (See items 18, 30, 31, 40, 47, 61, and 63 in Table 9.)

The distributions of responses for items 18, 30, 31, and 40 show that the responses of the experimental students were essentially the same as the control students prior to entering the experimental program, but showed a positive shift after undergoing the program. The distributions for items 47, 61, and 63 show that the experimental students responded as did the controls both before and after the experimental program.

Table 9

## Attitude Toward Work and Education in General: Response Data

| Pre - Pilot Test | | | Post - Pilot Test | |
|---|---|---|---|---|
| Item | C | E | Item | E |
| 18. Do you find ways to get out of doing work? | | | Did you look for ways to get out of work in this new approach to instruction? | |
| 1. Usually | 1 | 0 | 1. | 0 |
| 2. Sometimes | 15 | 14 | 2. | 1 |
| 3. Hardly ever | 7 | 9 | 3. | 22 |
| 30. Do you like being in high school? | | | Did you like being in school under this experimental approach? | |
| 1. Yes | 15 | 16 | 1. | 23 |
| 2. I don't care | 4 | 3 | 2. | 0 |
| 3. No | 4 | 4 | 3. | 0 |
| 31. Even if a job is dull and boring, will you stick to it until it's finished? | | | Even if a job was dull . . . stuck to it . . . finished under this experimental program? | |
| 1. Usually | 15 | 16 | 1. | 23 |
| 2. Sometimes | 6 | 4 | 2. | 0 |
| 3. Hardly ever | 2 | 3 | 3. | 0 |
| 40. How often are you bored by your classes? | | | How often were you bored by your classes in the experimental program? | |
| 1. I am never bored | 0 | 0 | 1. | 12 |
| 2. Sometimes I am bored | 16 | 18 | 2. | 9 |
| 3. I am often bored | 7 | 5 | 3. | 2 |
| 47. How often do you finish things you start? | | | How often did you finish things you started in the experimental program? | |
| 1. Often | 19 | 21 | 1. | 19 |
| 2. Sometimes | 2 | 2 | 2. | 3 |
| 3. Not very often | 2 | 0 | 3. | 1 |
| 61. Does it really matter to you if you do a good job or not? | | | Did it really matter to you if you did a good job or not in the experimental program? | |
| 1. Usually | 17 | 20 | 1. | 18 |
| 2. Sometimes | 4 | 1 | 2. | 5 |
| 3. Hardly ever | 2 | 2 | 3. | 0 |
| 63. How much does it matter to you whether you do your schoolwork well or not? | | | How much did it matter . . . did your schoolwork well during the experiment? | |
| 1. It matters a lot to me | 14 | 15 | 1. | 21 |
| 2. Sometimes it matters to me | 9 | 8 | 2. | 2 |
| 3. It doesn't matter to me | 0 | 0 | 3. | 0 |

Attitude Toward Office Education Courses. Of the 12 items in this category pre-administered to the population of office education students, 10 were selected for post-administration to the experimental students. Six are presented here to exemplify trends (See items 37, 44, 49, 51, 62, and 70 in Table 10).

The distribution of responses for item 51 shows that the experimental and control groups responded almost identically on the pre-administration, with the experimental students voicing a slight shift toward the negative after being in the experimental program. Items 37 and 44 show that the experimentals responded as did the controls both before and after the experimental program. Items 49, 62, and 70 show that the experimentals resembled the controls on the pre-administration and recorded shifts toward the positive at the termination of the experimental program.

Attitude Toward Peer-Instruction. Of the eight items in this category which were pre-administered to the population of office education students, six were selected for post-administration to the experimental students. Four will be presented here to exemplify trends. (See items 24, 41, 53, and 59 in Table 11).

The distributions of responses for all four of the items show that the experimental and control groups were quite similar in their responses on the pre-administration, and that the experimental students made strong positive shifts as a result of their experiences in the experimental program.

Spontaneous Comments During the Post-Interview. At the conclusion of each formal questioning session, the interviewer asked each group of experimental students to voice any other comments they cared to make. The majority of students who did comment used such phrases as, "It was an exciting way to learn"; "This is a lot more relevant to jobs"; "I would hate to go back to the other way"; "We learned more and got more individual attention"; "We could have gone up the scale even faster"; "If the whole year was like this we could learn everything in an office."

Regarding administration of the pilot modules, some students felt that the teachers were confused and overloaded because they had to look after both programs at the same time. They also stated that some of the details needed to be worked out better. A rather frequent comment was that the new system permitted them to move so fast that they often found themselves waiting for their supervisors and their instructional materials to catch up to them.

## Interpretation

Experimental-Controls Similarity. The close comparability of the frequency distributions of the responses of the control and experimental groups in all four attitude categories on the pre-administration shows that the groups were alike in attitude prior to the introduction of the experimental modules into the instructional system. This attests further to the precision of the matching procedures employed in constituting the groups.

In the sections to follow we offer interpretations of the data as indicators of the potential of this instructional system to influence attitudes. By no means is it implied that the attitude effects found after this short three-week exposure to the experimental modules are in any way permanent.

Self-Concept. Participation in the experiment produced no effect on self-concept. The data in this area show no attitude shifts by the students who underwent instruction in the experimental modules. It would have been surprising, in fact, if changes in self-concept had occurred after an average exposure of only 14.3 hours to a new instructional technique.

Attitude Toward Work and Education in General. Participation in the experiment produced moderate positive effects in this attitude area. Responses were roughly split between no-shift and positive-shift for the experimental students. No items showed response deterioration.

Table 10

## Attitude Toward Office Education Courses: Response Data

| Pre - Pilot Test | | | Post - Pilot Test | |
|---|---|---|---|---|
| Item | C | E | Item | E |
| 37. Do you feel the business education course(s) you have taken or are now taking will be of practical value to you in your future job plans? | | | Do you feel the office skills . . . learned under the experimental system will be of practical value to you? | |
| 1. Much practical value | 8 | 8 | 1. | 8 |
| 2. Some practical value | 11 | 13 | 2. | 14 |
| 3. Little practical value | 4 | 2 | 3. | 1 |
| 44. If you go on in school do you think the business education course(s) you have taken or are now taking will be of value? | | | If you go on in school do you think the skills learned under this approach will be of value to you? | |
| 1. Much value | 11 | 14 | 1. | 13 |
| 2. Some value | 10 | 8 | 2. | 10 |
| 3. Little value | 2 | 1 | 3. | 0 |
| 49. Is there enough time to practice the skill(s) you are required to learn in your business education course(s)? | | | Was there enough time to practice the skills you were learning in the experimental program? | |
| 1. Enough time | 7 | 8 | 1. | 13 |
| 2. Sometimes enough time | 10 | 9 | 2. | 9 |
| 3. Usually not enough time | 6 | 6 | 3. | 1 |
| 51. How often do you feel time was wasted during the business education course(s) you have taken or are now taking? | | | How often did you feel your time was being wasted during the experimental program? | |
| 1. I don't think time was wasted | 11 | 11 | 1. | 7 |
| 2. Some time was wasted | 9 | 10 | 2. | 13 |
| 3. A lot of time was wasted | 3 | 2 | 3. | 2 |
| 62. Do you like your business education course(s) as much as your other courses? | | | Did you like your office education course during this experiment as much as you like your other courses? | |
| 1. I like them a lot more | 5 | 2 | 1. | 16 |
| 2. I like them about as much | 13 | 16 | 2. | 6 |
| 3. I don't like them as much | 5 | 5 | 3. | 1 |
| 70. How often does your teacher tell you how you are progressing in your business education course(s)? | | | How often did your "teacher" tell you how you were progressing in the experimental situation? | |
| 1. Often enough | 6 | 3 | 1. | 15 |
| 2. Sometimes | 7 | 7 | 2. | 4 |
| 3. Hardly ever | 10 | 13 | 3. | 4 |

Table 11

## Attitude Toward Peer-Instruction: Response Data

| Pre - Pilot Test | | | Post - Pilot Test | |
|---|---|---|---|---|
| Item | C | E | Item | E |
| 24. Does it bother you when other people offer to help you with work? | | | Did it bother you when other students helped you learn the skills in the experimental program? | |
| 1. Hardly ever | 13 | 14 | 1. | 23 |
| 2. Sometimes | 7 | 9 | 2. | 0 |
| 3. Usually | 3 | 0 | 3. | 0 |
| 41. Do you find it easy to ask others for help? | | | Did you find it easy to ask others for help in the experimental situation? | |
| 1. Easy | 9 | 6 | 1. | 23 |
| 2. Somewhat easy | 10 | 13 | 2. | 0 |
| 3. Not easy | 4 | 4 | 3. | 0 |
| 53. How do you think you would feel about being taught business education skills by other students who have already learned the skills? | | | How did you feel about being taught . . . by other students who had already learned the skills? | |
| 1. I think I would like it | 10 | 8 | 1. | 21 |
| 2. I am not sure if I would like it | 10 | 11 | 2. | 0 |
| 3. I don't think I would like it | 3 | 4 | 3. | 2 |
| 59. Do you think you could teach other students the skill(s) you have learned in your business education course(s)? | | | Do you think you could teach other students the skills you learned in the experimental program? | |
| 1. Yes, I could teach other students the skill(s) | 6 | 9 | 1. | 19 |
| 2. I am not sure if I could teach other students the skill(s) | 13 | 12 | 2. | 2 |
| 3. No, I could not teach other students the skill(s) | 4 | 2 | 3. | 2 |

Attitude Toward Office Education Courses. Participation in the experiment produced a net positive effect on attitudes in this area. Only one item showed a negative shift, which was slight and probably reflected the need to wait for supervisor and/or materials to "catch up." For all other items responses were roughly split between no-shift and positive-shift for the experimental students.

Attitude Toward Peer Instruction. Participation in the experiment produced a marked positive effect upon attitudes in this area. On all items responses shifted in a positive direction for the experimental students.

Student Comments. Participation in the experiment produced uniformly positive comments on the system's instructional advantages. No comments were derogatory of the system, although some comments did point up the students' awareness of some of the administrative difficulties that attended this initial piloting of the system.

## TEACHERS' ATTITUDES

Several weeks before the experimental program began, the three members of the business education staff of Pacific Grove High School were interviewed individually for their views on (a) teacher role, (b) innovation, and (c) instructional methods in business education. As summarized below, their views were unanimous, or nearly so, on a number of issues germane to the purposes of the project.

Teacher Role. When they were asked to discuss their individual philosophy for teaching office education courses, their responses varied on details but they were in agreement that their primary function as teachers was to provide their students with marketable skills.

When asked if they thought the traditional role of the office education teacher should be changed, they replied in the affirmative, indicating that the teacher should become more flexible, serving as an aide and guide to the individual student, helping the individual determine his unique instructional goals, and monitoring the individual's instructional activities in achieving these goals.

All three agreed that decentralizing control, individualizing instruction, and letting students work at their own rates would work well in office education courses. Two had reservations about permitting individualization in the basic typing and shorthand courses.

Innovation. They appeared to be fairly knowledgeable about innovations in the area of business education, with two of them able to cite several specific current examples, and the other being able to cite two.

They were in agreement that in the development of new instructional programs teachers should play a major part, and all expressed a personal enthusiasm for becoming involved in such development.

When asked to state their views as to the need for innovation in business education, they were in agreement that the need is great. When asked to state on what factors the success of instructional innovations depends, they varied on detail but were unanimous that the biggest factor is teacher involvement in developing the innovations.

Instructional Methods. When asked the question, "Based on your experience in office education, are you satisfied in general with the office education curriculum?", the answers were in the negative. They wished to see more individualization of instruction, greater job relevance of content, and more involvement with the business community.

When asked whether they provide their students opportunity to work together, they all replied in the affirmative, stating that they do so as often as possible.

They were in agreement that the performance standards for their courses were high enough to meet entry-level job requirements in the office occupations. They unanimously deplored their inability to provide each student with the amount of individual attention needed.

Reactions to the Experimental Program. As the program took shape, the teachers voiced varying degrees of enthusiasm for it, and reservations about certain aspects of its workability. As the three successive waves of students were phased into the experimental modules, the work load upon the teachers became quite heavy, what with the requirement to keep the conventional course going simultaneously, conducting placement testing, interviewing job applicants, maintaining quality control, and, in general, monitoring the various system functions.

As the system shook down and the system functions began operating smoothly, the teachers came to see that the system did, in large part, provide for the very role, content, and method changes they had advocated in their interviews. They perceived firsthand that the system provided high job relevance, permitted complete individualization, was oriented toward achievement of entry-level performance standards, gave the

teacher a much more flexible role, provided for extensive student interaction, and fostered high levels of student interest and motivation.

The teachers and students became so involved with the system's functioning that they chose to let it run through the last day of classes rather than terminate it as previously planned.

## SUMMARY DISCUSSION OF FINDINGS

### UTILITY OF MODEL

This three-week pilot test of seven modules of the experimental system demonstrated its viability as an innovative approach to instruction in the office cluster of business occupations. In our opinion, the model appeared to be an inexpensive and readily implemented vehicle for improving such instruction. It met the need for immediate job relevance of instruction and the need for an integrated career progression. The appropriateness of the learning principles applied was beyond doubt—the instructional system was performance-oriented, with self-pacing and individualized instruction, and there was immediate and detailed feedback to students and system managers.

Peer instruction, we found to be a low-risk, high-return instructional medium. Through a *systematic* use of peer instruction, the need for additional teachers and instructional materials was eliminated. To achieve accountability and assure quality maintenance, a fixed criterion was established—every student was required to meet the performance standards established for the tasks undertaken on his job. Control of this quality standard remained in the hands of the qualified, certified teacher.

Establishment of flexible managerial functions within the system allowed for efficient use of staff, facilities, and equipment, and precluded the need for additional expenditures in this direction. In addition, this flexibility allowed for ease of management in adjusting the system to accommodate to on-the-spot requirements for change. Further, it made maximum use of existing instructional materials, equipment, and "software."

While the instructional system was designed and pilot-tested in the context of Pacific Grove High School, it was not specifically tailored to that school. The system was designed as a generalizable model that may be used in any location and may be used in curricula other than office education.

Inasmuch as the Pacific Grove High school business education department operates modestly, and is not elaborately endowed with staff, equipment, instructional materials, facilities, or budget, the system was tested under somewhat austere conditions. Since the system worked well under such limits, it should prove to be even more effective and problem free under more auspicious conditions.

A number of specific conclusions were also derived from the pilot test:

(1) The job stations for File Clerks I and II are more properly combined into a single station supported by a single job packet.

(2) The job placement tests should consist of all (or a representative sample) of the criterion-referenced performance tests rather than industry-type placement tests. The industry tests are much too limited.

(3) The use of advanced students as job surrogates is entirely feasible. This reduces the load on the teacher monitoring the system. We were unable to get an accurate estimate of the work load the system places on the teacher because in the pilot test each one had to do "double duty," carrying both the experimental and conventional programs.

(4) The students undergoing instruction in the system are a rich source of suggestions for variations in procedure, improvements, and ways to increase efficiency.

(5) The interest and motivation of students increased dramatically when they worked with actual job materials gathered from local business firms. Their production rate was often double or triple what our e timates had projected. These materials also provided students with actual problems, typically found in an actual office.

## PERFORMANCE DATA

In addition to the system's feasibility as an instructional vehicle, our data demonstrated that students trained this way for only three weeks showed superior knowledge, as reflected in written test error scores, and superior ability to perform entry-level job tasks, as reflected in performance test pass/fail scores. The written test differences, although small, were statistically significant; the performance test differences were of such magnitude that statistical analysis was unnecessary.

## ATTITUDE DATA

Experimental student attitudes showed an overall positive shift, as shown by distributions of responses to a comprehensive attitude questionnaire. This attitude facilitation was not interpreted as being a permanent phenomenon but as an indicator of the sort of attitude changes long-term use of such an instructional system is likely to produce.

Though the N was extremely small, the attitudes expressed by the business education teachers (before and during testing of the model) lead us to believe that this instructional model, incorporating a variety of instructional principles, represents a quantum step toward realizing goals of Career Education—performance objectives, individualization, job relevancy, criterion-referenced assessment, and guaranteed output.

## PLAN FOR IMPLEMENTATION AND EVALUATION

Implementing and evaluating the full system would require a considerable block of time. Even though the necessary antecedents have been pilot tested and designed for implementation, there is a need for a full field test. Moreover, time is needed for the evaluation procedures that a complete field test requires.

To meet these time requirements, we propose that an entire academic year be devoted to implementing and evaluating the full instructional system. The first semester should be allocated to the activities prerequisite to launching the system and for evaluation activities that need to be completed before the system is ongoing. The system should have at least a full semester to run in order to chart its effects on student learning, performance, and attitude. Figure 6 gives a general description of how we propose to allocate time over the academic year.

Time Allocation for Implementation and Evaluation

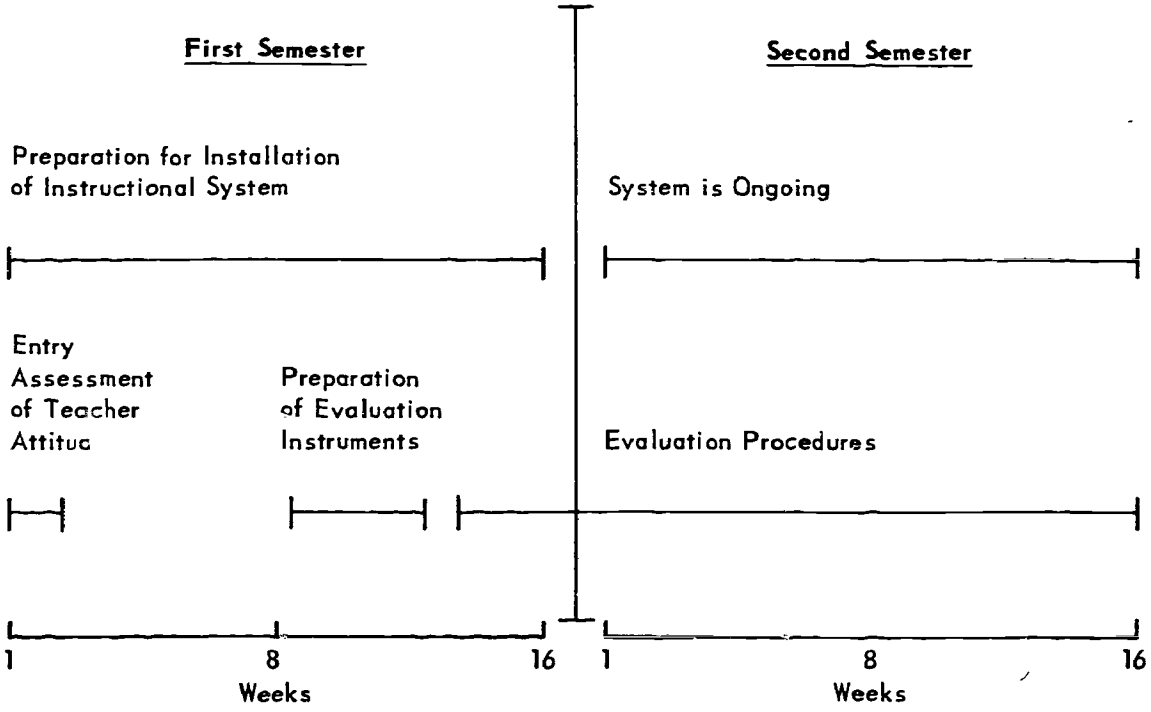



Figure 6

## IMPLEMENTATION PLAN

The first semester is divided into periods of time when certain major activities should occur. In general, the largest blocks of time are concerned with preparation of instructional materials. Other blocks are needed for an introductory workshop, coordination of administrative details, and recruitment of students. The major first-semester activities are summarized in Figure 7, which also indicates when and for what length of time the activities should proceed.

We feel that the implementation should begin with a workshop, in which the concepts of the system can be introduced and questions answered. A workshop also provides the occasion for creating task forces to begin the steps of preparing and coordinating the installation of the system.

Otherwise, very few activities in the implementation are dependent upon others for completion. Coordination is shown in Figure 7 as a discrete time block. It may be that coordination is a continuing activity but we have depicted it as a separate block, because the heaviest emphasis on coordination should fall during the time period shown.

The last few weeks of the semester should be devoted primarily to preparing students for entry into the system. Students who are to participate need to understand the concepts of the system and the benefits that might come from participation.

The issues and concerns that must be attended to in implementing the system are gathered in Table 12. The table outlines activities that seem to be obligatory. No doubt there are others. The implementation plan is only a guide to the major concerns that can reasonably be anticipated; it cannot be totally prescriptive. We suggest that it be used in this frame of reference.

## Preparation for Installation of System

**First Semester**

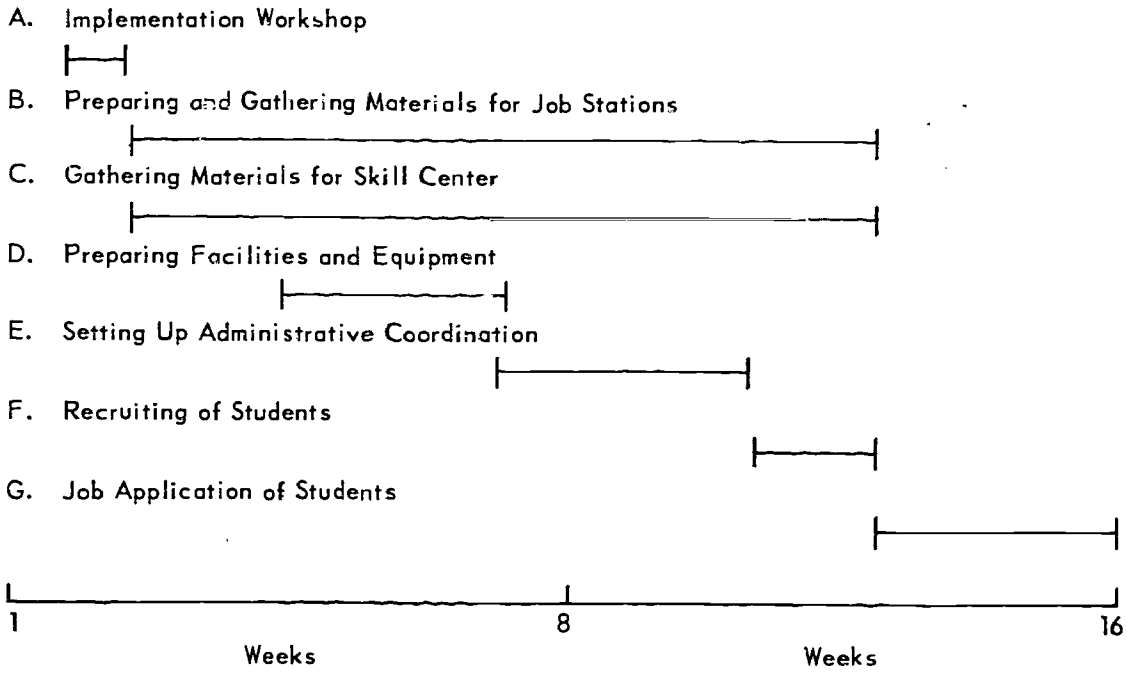



Figure 7

Table 12

### Plan for the Implementation of the System

**Major Activities**

A. Implementation Workshop
   a. Introduction to system
   b. Description of Pacific Grove Pilot Test
   c. Discussion of system
   d. Assignment of responsibilities
   e. Assignment of implementation tasks
   f. Final decision on number of students to be in program

B. Preparing and Gathering Materials for Job Stations
   a. Contact with local business concerns
   b. Collection of materials
   c. Adaptation of materials for job stations
   d. Structuring of materials for job tasks
   e. Packaging of materials for job tasks

*(Continued)*

Table 12 *(Continued)*

**Plan for the Implementation of the System**

**Major Activities**

C. Gathering Materials for Skill Center
   a. Survey of materials at hand
   b. Addition of materials, if needed
   c. Division of materials, based on job function structure
   d. Preparation of index to Skill Center materials

D. Preparing Facilities and Equipment
   a. Identifying needs for equipment
   b. Arranging for equipment to be present when needed
   c. Identifying space needed
   d. Arranging for space

E. Setting Up Administrative Coordination
   a. Identifying blocks of time needed
   b. Identifying realignments in class schedules
   c. Awarding of course credit
   d. Availability of teachers
   e. Sources of conflict in facilities and equipment

F. Recruiting Students
   a. Publicity on system through brochures and handouts
   b. Arranging for discussions with students about the system
   c. Getting list of students interested in program

G. Job Application of Students
   a. Administering job application and interview procedures to students
   b. Final selection of students who will participate in program

## EVALUATION PLAN

Two major thrusts are necessary for a full field evaluation of the system. One is toward a description of what changes have occurred in students and teachers as a result of participation in the instructional system. For a system to be considered effective, it must meet its stated goals; that is, it must do what it proposed to do. This thrust has had various labels. We have used *summative evaluation* as a descriptor.

The other thrust can be called *formative evaluation.* It is a collection of evidence directed toward improvement of the workings of the system. This collection indicates what internal flaws exist and where improvements should be made.

In order to collect data for a summative evaluation, we must have instruments to measure and assess skills and attitudes students and teachers have before they enter and work in the system. The same instruments are used to measure and assess any changes that occurred after participation in the system. Data for formative evaluation are collected while the system is operating. We cannot know what flaws exist until students are actually working in the system.

Each kind of evaluation requires different evidence and different time periods. Formative takes place *during* the entire period a system operates, while summative occurs *before and after* the period of student and teacher involvement. Figure 8 indicates when the various evaluation activities should take place.

## Data Collection for Evaluation

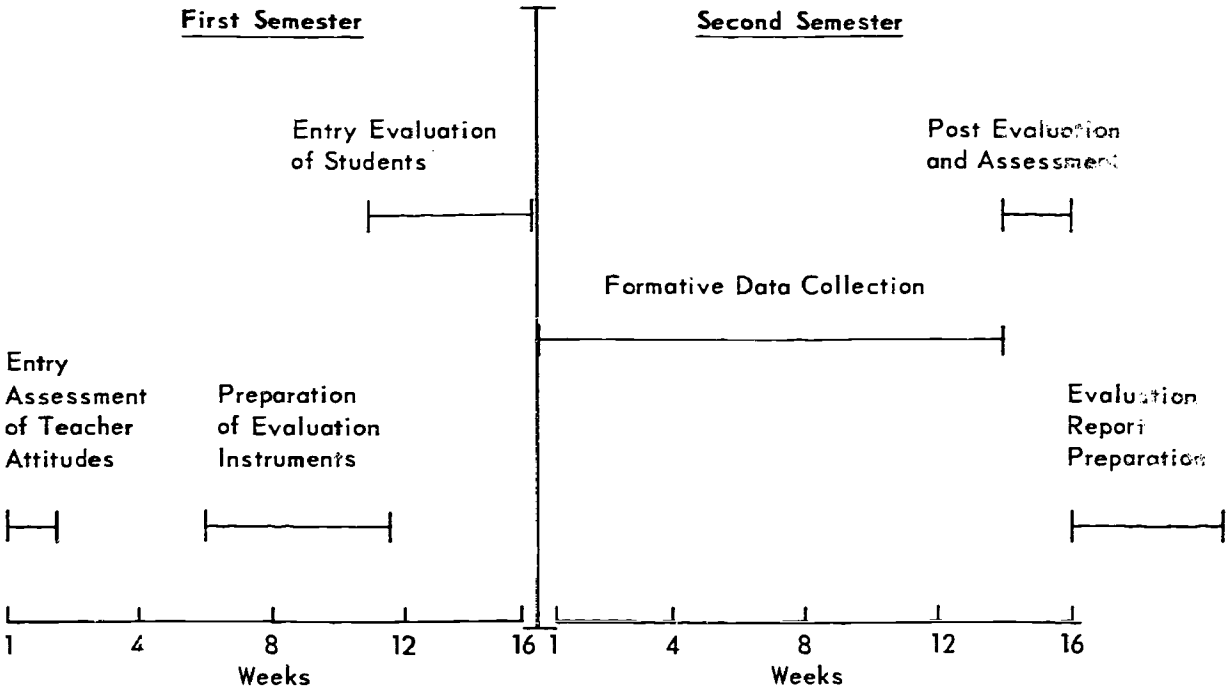



Figure 8

It is important to sample teachers' attitudes before they have any direct involvement in the program. The first day of the implementation workshop is an appropriate time. Another block of time should be spent in designing the various kinds of attitude surveys, formative evaluation procedures, skill and knowledge tests. Background information on students can be collected at a later time, possibly during the entry evaluation of the students.

Table 13 itemizes the various kinds of tests and measures required for each kind of evaluation. The instruments used in the summative evaluation are concerned with registering change in attitude and acquisition of skills. That information can be used to see whether the system has worked effectively in meeting its stated instructional goals.

The instruments for formative evaluation are directed toward trouble spots and improvement in the operation of the system. There are two basic kinds of instruments: (a) reactions of students and teachers to each component of instruction, and (b) empirical information about time to completion, frequency of use, and student progression through the system.

As with the implementation plan, we have used our experience with the pilot test to select activities that seem necessary and appropriate to install and evaluate the entire system. Each plan offers a basic core of activities, but they can be supplemented and rearranged. Each plan is a guide, not a prescription.

Our experience in pilot testing seven modules of the model leads us to conclude that the model can be field tested at no additional cost in personnel, equipment, or facilities, providing the school under consideration can meet minimal basic requirements.

Table 13

## Plan for Data Collection for Evaluation of System

I. **Summative Evaluation of System**

A. Entry Assessment (before system is in operation)
   1. Teacher attitudes toward:
      Student responsibility
      Innovation
      Role of teacher
      Instructional techniques
      Evaluation techniques
   2. Student attitudes toward:
      Self-concept
      Work
      Education and school
      Office education
   3. Entry skills of students:
      Office skills (typing, filing, business machines . . . )
      General cognitive abilities (reading, writing, arithmetical skills . . . )

B. Demographic Description of Students
   1. Intelligence estimate
   2. Work background
   3. Office courses taken
   4. Grade point average

C. Post Assessment (at the close of system operation)
   1. Reassessment of teacher attitude
   2. Reassessment of student attitude
   3. Reassessment of student skills

D. Reactions of Students, Teachers, and Administrators Toward the Instructional System
   1. Open-ended questionnaire
   2. Group discussion (taped)

II. **Formative Evaluation of System**

A. Student Progression to New Jobs
   1. Time span in job
   2. Time in skill center
   3. Number of progressions
   4. Kinds of progressions

B. Student Evaluation of Jobs
   1. Likes and dislikes of job modules
   2. Identification of trouble spots
   3. Identification of work flow difficulties

C. Surrogate Evaluation of Jobs
   1. Difficulties with quality control procedures
   2. Difficulties with work flow
   3. Kinds of interactions with students

*(Continued)*

Table 13 *(Continued)*

**Plan for Data Collection for Evaluation of System**

D. Studend/Surrogate Evaluation of Skill Center and Skill Center Materials
   1. Adequacy of materials
   2. Identification of needed materials and equipment
   3. Adequacy of skill center concept
   4. Identification of materials most used
   5. Kinds and number of interactions with students

E. Student/Surrogate Evaluation of Job Materials and Equipment
   1. Adequacy of materials and equipment
   2. Need of new materials and equipment
   3. Quality control of materials produced

F. Quality Control Procedures
   1. Random checks of internal quality control procedures
   2. Student/surrogate attitudes toward standards
   3. Inadequacies or gaps in standards

G. Job Application and Placement Procedures
   1. Trials to successful application
   2. Interview failures
   3. Adequacy of job application tests
   4. New procedures or tests necessary

H. Peer Instructor/Trainee Roles
   1. Ratio of instructors to trainees
   2. Trainee reports of adequacy of peer instructors
   3. Number of occasions surrogate functions as instructor
   4. Number of changes in peer instructors
   5. Time spent in each job as peer instructor or trainee

## IMPLICATIONS FOR FURTHER RESEARCH

This instructional model raises several research and developmental questions which could be investigated in a systematic manner. We offer them as suggestions for future research projects.

### Extension and Adaptation of the Model to Local Conditions

Schools very often serve varied occupational needs. They have to train students for entry into occupations commonly found in the community. They have to train students for entry into occupations where there is little local but large regional demand. They have to train students with unique backgrounds and needs for occupational entry.

This model has been designed as a generic one, without any consideration of the local and specific conditions various school systems face in business education. One generic model may be inadequate; several generic models may have greater utility, if developed on some common problems various kinds of schools face. Some possible patterns are: rural schools with small business education departments and high student entry in employment in limited industries in the community; large urban school districts with students of unique backgrounds and high post-secondary unemployment rates; schools whose students commonly seek employment outside of the community.

These patterns raise questions—so far not studied—that would shed light on the learning process: Can peer instruction be used with all groups of students, even those who are seriously deficient in cognitive skills? Can schools use the modular approach to prepare students for entry into highly specialized local occupations? Is a single generic model adequate, or are there several basic models that are extensions and adaptations of this concept?

### Extension and Adaptation of the Model to Other Occupational Areas

One of the goals of the project was to design a generalizable model. The main research question in this area is whether the model is generalizable to other vocational areas, such as preparation for entry into trade and industry and into distributive and service occupations.

A series of specific questions that might be investigated are: What components of the model are directly usable in instruction in these vocations? What components need reconceptualization and which need only minor revisions? Is the skill center concept necessary in learning to operate machine tools? Are job stations the basic organization for trade skills like carpentry and masonry?

A research project in each of these occupations might lead to reconception of the peer-instructor roles and modular approach, the basic integers of this instructional model.

### Career Education Sequence

With the new national emphasis on career education, there are several important curriculum organization questions: What are ways by which students can briefly involve themselves in occupations in order to make a career choice? What are ways by which students can become aware of occupations? Are direct experiences more valuable in making a career choice, or are vicarious experiences through films, slides, and tapes sufficient?

The model has used several basic instructional strategies, variations of which might be useful in career education curricula. Can students who have recently been hired after graduation serve as peer counselors to students who are interested in those occupations? Can the modular job approach be used as an instructional strategy for offering students awareness of a wide variety of occupations?

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