

71-2884

ENGELBART, Leon Prange, 1925-
DEVELOPING A VOCATIONAL EDUCATION
CURRICULUM MODEL.

The University of Nebraska, Ed.D., 1970
Education, vocational

University Microfilms, A XEROX Company, Ann Arbor, Michigan

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

DEVELOPING A VOCATIONAL EDUCATION
CURRICULUM MODEL

by

Leon P. Engelbart

A Dissertation

Presented to the Faculty of
The Graduate College in the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Doctor of Education
Department of Secondary Education

Under the Supervision of Professor Rex K. Reckewey

Lincoln, Nebraska

March 1970

TITLE

DEVELOPING A VOCATIONAL EDUCATION

CURRICULUM MODEL

BY

Leon P. Engelbart

APPROVED

DATE

Rex K. Reckewey

May 12, 1970

Max Hansen

May 12, 1970

Loren R. Bonneau

May 12, 1970

SUPERVISORY COMMITTEE

GRADUATE COLLEGE

UNIVERSITY OF NEBRASKA

TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
LIST OF CHARTS	viii
Chapter	
I. INTRODUCTION	1
THE PROBLEM	3
Purpose of the study	3
Significance of the study	3
Basic assumptions of the study	4
Limitations	4
PROCEDURES	5
Review of literature and current research	5
Determination of vocational area, job titles, and competencies	6
Determination of performance criteria	7
Survey of selected in-service training programs in industry	7
Development of the instructional program	8
Implementation of the proposed curriculum model.	8
DEFINITION OF TERMS	9
Competencies	9
Job titles	9

Chapter	Page
Performance criteria	9
Performance level.	9
Vocational education	9
II. REVIEW OF LITERATURE	11
REVIEW OF HISTORICAL DEVELOPMENTS IN	
VOCATIONAL EDUCATION	11
RECENT TRENDS IN EDUCATIONAL PLANNING	17
Formulation of educational objectives	19
Selection of learning experiences	20
Organization of learning experiences	22
Instructional procedures	23
Individualized instruction	25
Media	29
Evaluation of instruction	32
SUMMARY	35
III. ESTABLISHING THE VOCATIONAL AREA, IDENTIFYING THE	
JOB TITLES, AND DETERMINING THE NEEDED	
COMPETENCIES	36
ESTABLISHING THE VOCATIONAL AREA	36
IDENTIFYING JOB TITLES	39
A review of the literature	39
Considerations employed in selecting the	
job titles for inclusion in the program.	42
IDENTIFYING COMPETENCIES	45
Review of Literature	45
Interviews in industry	50

Chapter	Page
SUMMARY	62
IV. DETERMINING THE PERFORMANCE CRITERIA	63
SUMMARY	72
V. REVIEW OF SELECTED IN-SERVICE TRAINING PROGRAMS	
IN INDUSTRY	73
PETROLEUM COMPANIES	73
Mobilgas Petroleum Company	74
Phillips Petroleum Company	74
Standard Oil Company	75
Continental Oil Company	76
AUTOMOBILE MANUFACTURERS	77
Ford Motor Company Training Station	77
General Motors Training Center	81
Chevrolet Division	81
Pontiac Division	82
Chrysler Corporation	83
SUMMARY	84
VI. DEVELOPING THE INSTRUCTIONAL PROGRAM	86
SEQUENCING THE COMPETENCIES	87
Volume gas station attendant	89
General service station attendant	90
Tire specialist	91
Wash and wax specialist	92
Lubrication specialist	92
Service station mechanic	93
Exhaust system specialist	94

Chapter	Page
Brake specialist	94
Front end specialist	95
Tune up and electrical specialist	95
Quick service specialist	97
Light repair specialist	98
DEVELOPING THE CURRICULUM	98
SUMMARY	127
VII. IMPLEMENTING THE PROPOSED CURRICULUM MODEL	128
INSTRUCTIONAL TECHNIQUES	130
EQUIPMENT AND FACILITIES	141
STUDENT AND PROGRAM EVALUATION	149
ADMINISTRATIVE POLICIES AND PROCEDURES	154
SUMMARY	158
VIII. SUMMARY, FINDINGS, CONCLUSIONS AND	
RECOMMENDATIONS SUMMARY.	159
Purposes of the study	159
Significance of the study	159
Limitations	160
Procedures	160
FINDINGS	161
CONCLUSIONS	163
RECOMMENDATIONS	164
Implementing the model	164
Further study.	165
BIBLIOGRAPHY	167
APPENDIX A	173

Chapter	Page
APPENDIX B	176
APPENDIX C	178

PREVIEW

LIST OF TABLES

Table	Page
I. Consensus summary of competencies required of employees in three job titles and nine areas of specialization as identified by practicing automotive personnel	53
II. Relative importance assigned to the general related competencies as identified by practicing automotive personnel.	61
III. Time allocations for successfully completing each job as indicated by participating automotive personnel	67
IV. Aids used by Conoco Training Station for training service station employees	79
V. Overview of equipment, instructional materials, instructional processes and evaluational technique necessary for teaching the 111 competencies included in the proposed curriculum model	101

LIST OF CHARTS

Chart	Page
I. Instruction Sheet for Competency Number Fifteen	133
II. Instruction Sheet for Competency Number Sixteen	134
III. Instruction Sheet for Competency Number Seventeen	135
IV. Instruction Sheet for Competency Number Eighteen	136
V. Instruction Sheet for Competency Number Nineteen	137
VI. Instruction Sheet for Competency Number Twenty	138
VII. General Related Competencies Evaluation	139
VIII. Sample Site Plan and Instructional Areas for Proposed Vocational Education Curriculum Model	144
IX. Instructional Areas for Volume Gas Station Attendant With Locations of Areas for Teaching Required Competencies (job title 1).	145
X. Instructional Area for General Service Station Attendant and Specializations with Locations of Areas for Teaching Required Competencies (job titles 2, 3, 4, and 5)	146
XI. Instructional Area for Service Station Mechanic and Specializations with Locations of Areas for Teaching Required Competencies (job titles 6, 7, 8, 9, 10, 11, and 12).	147
XII. Record of Individual Progress by Competencies for a Volume Gas Station Attendant.	151
XIII. Composite Record of Individual Progress by Job Titles.	152

CHAPTER I

INTRODUCTION

The vocational education program in the curriculum of most secondary schools has encountered several persistent and recurring problems. Common and most pressing of these problems are (1) developing suitable programs for high and low ability students, (2) stimulating student interest in vocational education and overcoming chronic absenteeism of students, (3) providing sufficient flexibility in the program to accomodate students with changing educational goals, (4) overcoming the stigma that vocational programs are the "dumping ground" for students who can not succeed, and (5) overcoming some of the rather restrictive provisions of earlier vocational legislation.

In the more recent years a growing awareness of the need for more and better vocational education programs has emerged. This awareness is the result of (1) the shortage of skilled and semi-skilled labor even though the number of unemployed youth has risen, (2) the stimulation from the Report of the President's Panel of Consultants on Vocational Education, (3) the increased support from the resulting vocational legislation, and finally (4) the increased amount of research in the area of vocational education and a growing body of literature in the field.

As a result of this new awareness about the increased necessity for vocational education a growing awareness for new and diversified programs in vocational education has occurred. The subsequent desire for new curriculums and teaching methods to help meet these needs is evident.

Most institutions and organizations involved in the training of students and/or workers have shown a growing desire to individualize instruction. Evidence of this trend can be seen in such programs as those being developed and utilized in some of the job corps, junior colleges, vocational-technical schools, and training programs in industry.

The secondary schools are also reflecting this trend toward more individualized instruction through the use of modular or flexible scheduling. This organizational arrangement is designed to provide an effective structure to accommodate team teaching and its resultant large group, small groups, and independent study. This approach is a deliberate attempt to attain individualized instruction.

Individualized instruction has always been advocated and recognized by vocational educators as one of its real strengths. Few programs however, have been entirely successful in adapting the vocational education programs to the ability levels of all students. Consequently vocational education has often failed to accommodate adequately the needs of the upper and the lower ability students.

The foregoing problems and developments have led vocational educators to consider ways of organizing the

curriculum to provide more opportunities for individual instruction.

THE PROBLEM

Purpose of the study. The basic purpose of this study is to develop an individualized instructional model in a selected area of the vocational program that should make students employable and productive workers as well as effective citizens when they leave the secondary school. More specifically, the purposes of the study were: (1) to identify a vocational area requiring significant numbers of skilled and semi-skilled individuals, who could be prepared by the secondary school for entry-level employment upon graduation, (2) to determine the competency levels and/or performance criteria that are requisite to success on the job in the vocational area identified above, and (3) to design an educational program and instructional approach which would promote effective and efficient learning of the required competencies described above.

Significance of the study. It is anticipated that the results of this study will provide a practical guide for the school system which wishes to individualize instruction in a selected vocational area and to extend the model to other areas of vocational education. It is also expected that this program might provide a more satisfactory method of reporting the students capabilities to technical schools, future employers, and other concerned persons. Such a

report would reflect the competencies the students have attained in their vocational training program.

Basic assumptions of the study. In the conduct of this study the following basic assumptions were considered to be essential: (1) vocational education is a significant curriculum area in the comprehensive high school, (2) competencies needed in a selected vocational education area are identifiable, and (3) systematic planning of the vocational education program and greater individualization of the instructional process will lead to more rapid and effective learning of the required vocational competencies.

Limitation. Only one area of vocational education was selected for this development of a curriculum model. The area which was selected needed trained workers and is a part of the Trades and Industries Program as specified by the United States Office of Education. This might restrict its applicability to some other areas of the vocational education program. The study was also limited to entry level training programs which could reasonably be provided in the vocational education program of the secondary school. It was assumed that students who desire additional training or specialization could enroll in a post secondary vocational--technical school, take on-the-job training, or attend industry schools under business sponsorship.

PROCEDURES

The procedures employed in this study involved six phases. They were: (1) reviewing the literature and related research, (2) determining the vocational area, the job titles, and the competencies, (3) determining the performance criteria, (4) surveying selected in-service programs in industry, (5) developing the instructional program or model, and (6) implementing the model.

Review of literature and current research. The first purpose of this review was to obtain a brief history of vocational education and especially the history of vocational legislation. Included in this analysis was the deliberation of the various presidential and congressional committees that studied the needs of industry for skilled and semi-skilled manpower.

A second part of the review of the literature was an examination of the current research devoted to the area of educational planning. Particular attention was directed to how curriculum makers determine the instructional content of vocational education courses. Additional study was undertaken to determine the most promising ways of presenting this content. Consideration was also directed to a review of current instructional practices at secondary schools, vocational schools, junior colleges, military schools and the training schools of industry.

Finally, an effort was made to identify more satisfactory ways of evaluating and reporting pupil progress that are consistent with the new instructional procedures.

Determination of vocational area, job titles, and competencies. The identification and selection of the vocational field for developing the model program, was based primarily on a review of the literature in relation to current labor trends and needs at the national and state level. After determining the vocational field, a list of job titles was determined by reviewing the current literature. The United States Office of Education and the United States Department of Labor publications were the prime contributors to this list of job titles. Additional titles were secured by reviewing pertinent literature from industry. With consideration given to the limitations of secondary vocational students and programs, the original list of job titles was condensed by eliminating those job titles which require considerable technical competencies.

To determine the competencies needed for the selected job titles, a review of selected federal and industrial publications was made. From this information, an interview form was prepared with a list of the selected job titles and a tentative list of suggested competencies. This interview form was then used to interview workers, supervisors, and managers about the competencies required for each of the job titles. These individuals were asked to suggest additions and deletions to the competency list provided. An

evaluation of these interviews resulted in the establishment of a final list of required competencies.

Determination of performance criteria. Three methods of identifying performance criteria were provided from the literature. They were (1) defining the important characteristics of performance accuracy, (2) describing the acceptable performance in terms of time limits, and (3) specifying the minimum number (or percent) of correct responses considered acceptable. Publications from industry provided a means of determining the performance criteria for many of the required competencies. Additional performance criteria was provided from the interviews with personnel from industry.

Survey of selected in-service training programs in industry. In order to collect information relative to instructional content, teaching methods, training resources, and evaluative procedures which are currently used in industrial training programs the following groups were visited: (1) training representatives from petroleum companies, and (2) training representatives from automobile manufacturers.

Two types of petroleum companies were contacted for information relative to training gasoline station employees. The first type of company visited, called volume or cut rate gas stations, basically sell gasoline. The second type of company visited, called gasoline service stations, sell gasoline and offer many other types of automobile service.

Three major automobile manufacturers were contacted for information relative to training automobile repair employees. They were: Chrysler Corporation, Ford Motor Company, and the General Motors Corporation.

Development of the instructional program. The review of literature and related research, the determination of the vocational area, job titles and competencies, and the collection of the instructional programming information divulged the information needed to plan the instructional program for the selected vocational field. The required competencies were sequenced according to commonly accepted instructional methods used in vocational education. After the competencies were sequenced, a summary was made of the collected information which was pertinent. This summary included the sequenced competencies, the materials, tools, and equipment needed, the instructional aids recommended, the instructional process used for each aid, and finally the suggested means of evaluating each competency.

Implementation of the proposed curriculum model. In order to implement the proposed instructional model, suggestions were made in four general areas of concern. The first section made suggestions as to the instructional techniques to be employed in individual instruction. The second section made recommendations for the physical plant, facilities and equipment needed for implementing this individual instructional model. This type of instruction would also require

considerable change in the methods used for the evaluation of the total program. Finally, recommendations were made as to the general administrative policies needed for implementing and operating the proposed curriculum model.

DEFINITION OF TERMS

Competencies. An all inclusive terms which includes: (1) tasks needed and performed on the job, (2) skills and knowledges needed to perform these tasks, and (3) general related skills and knowledges needed for personal and social job success.

Job titles. Common usage determines the wording of job titles. They are specific in terminology.

Individualized instruction. Instruction which is immediately available when needed by the individual.

Performance criteria. Standards established by industry for judging the number, quality, and time of performance functions executed by students while completing a required course sequence.

Performance level. A pre-determined proficiency level based on industry's requirements in which competencies are developed. (Can be used interchangeably with performance criteria.)

Vocational education. That education which is primarily designed to develop skills, abilities, understandings,

attitudes, work habits, and appreciations, encompassing knowledge and information needed by workers to enter and make progress in employment on a useful and productive basis.

PREVIEW

CHAPTER II

REVIEW OF LITERATURE

Changing social and economic conditions have a profound effect on industry and its workers. As a result of this effect Congress has passed legislation for the purpose of encouraging education to train workers for industry. Starting with the Smith-Hughes Act and each subsequent act Congress has broadened the spectrum of training programs as to the number of occupations as well as to the levels within each occupation. With this broadening of programs the curriculum maker has experienced renewed pressures to train workers in a more efficient manner which is commensurate with the individual's abilities and interests.

REVIEW OF HISTORICAL DEVELOPMENTS

IN VOCATIONAL EDUCATION

Benjamin Franklin was among the first to recognize the need for a formal organizational pattern in vocational training when he advanced his idea for the academy in 1751. He believed that secondary schooling should provide for students with a wide range of abilities. In addition to the basic academic subjects, he recommended instruction in such subjects as agriculture, mechanical theory, drawing, and commerce. Unfortunately his proposed curriculum was too

revolutionary for the time, and the courses as they were actually taught were little different from those in the Latin grammar schools.

The Russian and Swedish plans of instructional shop-work were experimented with in some eastern centers of the United States, and received considerable impetus by Woodward in St. Louis. He advocated training in handwork for all secondary school boys. In 1879 he established the Manual Training School of Washington University which was financed by private individuals.

Industrial growth coupled with the passage of immigration laws in the early years of the twentieth century restricted the entry of skilled labor from Europe and created a shortage of skilled laborers in the United States. The prevailing apprenticeship system did not satisfy adequately the needs of industry for skilled workers. At the same time the high cost of vocational education and the lack of leadership in vocational education meant that the nation's schools contributed very few people to the supply of skilled workers.

Congress reacted to this shortage of skilled labor by passing the Smith-Hughes Act (1917). The financial encouragement together with the sense of direction given by this act, helped to relieve this shortage of skilled labor. Minor amendments were subsequently made to this Act to encourage education to offer several new types of occupational training.

As the nation continued to grow industrially, the need for skilled workers again became acute. In 1961, President Kennedy asked Congress to authorize a panel to review and to evaluate the existing National Vocational Acts. The request was granted, the Panel was formed, and their report was made in 1962. In part they said:

Enrollments in vocational education are not sufficient to satisfy either the needs of people or the projected needs of the labor force. Hundreds of thousands, perhaps millions, of youth and adults in rural and urban America are denied the amount and kinds of opportunities for vocational education which, as citizens of a free society, they should have. If the states and Federal Government seriously intend to provide these opportunities, a great deal more than token expansion should occur, with special attention, in particular, to the following programs.

High school programs have not kept pace with the increasing numbers of young people, their concentration in urban centers, or their special difficulties in entering the labor force

Youth with special needs are not well served by high school vocational education programs. There are too few special programs to promote the retention and adjustment of these troubled young people

Most dropouts seek employment when they leave school; but generally they do not possess salable skills, and the jobs open to them are quite limited. If the potential dropout's school program could be adjusted to include occupational preparation, he might remain in school longer

¹United States Office of Education, Education for a Changing World of Work, Report of the Panel of Consultants on Vocational education. (Washington: Government Printing Office, 1963), pp. 208-209.

Acting upon the recommendation of the Panel, Congress passed the Vocational Education Act of 1963, which enabled schools to institute new programs in vocational education. Unfortunately even with these new programs, the rate at which skilled workers could be trained did not keep pace with our industrial growth. Moreover, as a result of our technological advancement, unskilled workers experienced increased difficulty in finding suitable employment.

In 1964 Grant Venn authored a report sponsored by the American Council on Education. This report concentrated on post secondary vocational education and included the following recommendation: "High schools should establish vocational education programs which offer all youth leaving high school marketable skills or preparation for further occupational education."²

Even though industry sorely needed skilled laborers many high school students continued to drop out of secondary schools or avoided the vocational programs in favor of college preparatory programs. In addition, many college students failed to graduate, and they added to the growing number of people who were considered to be underemployed.

In a recent review of the manpower needs and employment opportunities of the nation Tuckman and Schaefer devoted a special section to youth:

²Grant Venn, Man, Education and Work, Post Secondary Vocational and Technical Education, (Washington: American Council on Education, 1964), pp. 166-167.