DOCUMENT RESUME

ED 263 327 CE 042 783

AUTHOR Hoggard, David; Pedras, Melvin J.
TITLE Utilizing the DACUM Process in the Development of a CAD Curriculum.
PUB DATE Dec 85
NOTE 14p.; Paper presented at the American Vocational Association Convention (Atlanta, GA, December 6-8, 1985). For a related document, see CE 042 674. Document printed on gray paper.
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Competency Based Education; Computer Oriented Programs; *Curriculum Development; *Drafting; *Industrial Education; *Job Analysis; Job Skills; Occupational Information; Postsecondary Education; Two Year Colleges
IDENTIFIERS *Computer Assisted Drafting; *DACUM Process

ABSTRACT

Originally created in the late 1960s, DACUM (Developing a Curriculum) is a method for conducting an occupational analysis that identifies the tasks that must be performed by persons employed in a specific job or occupational area. As a result of the occupational analysis, a profile chart is developed that identifies the duties and tasks associated with the occupation being analyzed. The process involves use of a group of expert workers from the occupational area who are guided through a brainstorming session to reach consensus on the skills required for successful workers in that occupation. The DACUM process is quick (two to three days), inexpensive ($500 to $1,000) in comparison to traditional occupational analysis, and has excellent public relations value. The competency profile can be used in development of competency-based instructional programs. Clark County Community College used the DACUM process to develop a computer-assisted drafting (CAD) program. A panel representing supervision and workers/technicians was established. This panel modified a description of a CAD technician and identified the duties and appropriate tasks. These duty and task statements were organized in a logical sequence (profile chart). (The CAD profile chart is appended.) (YLB)

UTILIZING THE DACUM PROCESS IN THE DEVELOPMENT OF A CAD CURRICULUM

Paper Presented at the
American Vocational Education Association Annual Conference
December 6-8, 1985
Atlanta, Georgia

Mr. David Hoggard
Director of Technical and Occupational Education
Clark County Community College
North Las Vegas, Nevada

&

Dr. Melvin J. Pedras
Associate Professor of Industrial Education
University of Idaho
Moscow, Idaho

ACKNOWLEDGEMENT

The general information regarding DACUM and the DACUM Process was obtained from the DACUM Handbook which is copyrighted by The National Center for Research in Vocational Education, Ohio State University.

WHAT IS DACUM

DACUM is an acronym for D eveloping A C urricul UM.

It is a method for conducting an occupational analysis which identifies the task which must be performed by persons employed in a specific job or occupational area. As a result of the occupational analysis a profile chart is developed which identifies the duties and task associated with the occupation being analyzed.

The process involves the use of a chosen group of expert workers from the occupational area under consideration and guiding them through a brainstorming session to reach consensus on the skills required for successful workers in that occupation.

A History of DACUM

DACUM was originally created in the late 1960's through a joint effort by the Experimental Projects Branch, Canada Department of Manpower and Immigration in conjunction with the Learning Corporation of New York. The process was developed to provide technical direction in production of a curriculum guide for The Womens Job Corp Program located in Clinton, Iowa. Following this initial effort an experimental DACUM for a typical occupation

was adopted by the Nova Scotia Newstart Corporation in 1968. In 1969 the process was adopted by Holland College of Charlottetown, Canada, and is used as the basis for the development of all of their educational programs. DACUM is widely used throughout Canada, and Humber College in Toronto has established a DACUM Exchange Center. In fact Clark County Community College has on file 450 DACUM charts representing approximately 400 occupations which were obtained from the Exchange Center.

In 1976 Dr. Robert Norton of the National Center for Research in Vocational Education at Ohio State University arranged to have a representative from Holland College to conduct a DACUM Workshop at the National Center. In the same year Dr. Norton and staff from the National Center conducted DACUM workshops for a number of colleges, technical institutes and other agencies across the country. They also introduced the concept to persons from several foreign countries. Since its introduction the DACUM Process has been used extensively by a number of institutions; most notably Colorado State University which has conducted more than 125 workshops. Other major users include institutions in North and South Carolina, Florida, and Ohio.

In response to requests to train facilitators in the DACUM Process, the National Center conducted its first facilitator training institute at the National Center in July 1984. The second training institute was conducted in October 1984 at Caldwell Community College and Technical Institute in Hudson, North Carolina, and the third institute was held in Dallas, Texas in March 1985 for Brookhaven Community College. I was fortunate to have been a participant in the third institute.

WHY DACUM

The DACUM Process provides an opportunity to establish a relevant up-to-date and localized curriculum base for development of instructional programs. It is built upon input from business and industry that are the ultimate employers of students which are products of the instructional program. DACUM is based upon three premises:

1. Expert workers are better able to describe or define their occupation better than anyone else.
2. Any job can be defined in terms of the task successful workers in that occupation perform.
3. All tasks have direct implications for the knowledge and attitudes that workers must have in order to perform the task correctly.

As an occupational analysis procedure DACUM has attained success because its structure allows occupational duty and task statements to be identified

effectively, quickly, and at relatively low cost.

The DACUM Process can be completed in two to three days once a panel has been selected. When compared to traditional occupational analysis, DACUM is inexpensive--usually $500 to $1,000 will cover the cost of a workshop.

The end result of the DACUM Process is the development of a competency profile that reflects those tasks and duties required by local business and industry. The information acquired can be used in the development of competency-based instructional programs.

The utilization of this process has excellent public relations value. Business and industry are usually very receptive to the idea that education is serious about asking them for input into what goes into a curriculum and what tasks students must be able to perform to function effectively in their field.

WHEN SHOULD DACUM BE USED

Once the need for a new instructional program has been established, DACUM can be used to quickly identify the task required by successful workers to effectively perform on the job. The use of DACUM will ensure that the new program will be relevant if the identified competencies are used as a basis for program planning and instructional development.

A DACUM panel can be convened to identify the competencies being taught in an existing program. Based upon this review existing curriculum can be modified to ensure its relevance to the occupation.

The process may be used to review existing profile charts to determine if they still represent an accurate picture of the task performed by workers in that occupation. Depending on the occupational area and the amount of technological change within it, charts should be updated approximately every three years.

Other uses of the DACUM Process may include: preparing job descriptions, conducting worker performance evaluations, conducting training needs assessments, and implementation of technical skills committees as required by the Carl Perkins Act.

DEVELOPING A COMPUTER ASSISTED DRAFTING PROGRAM

Clark County Community College had been offering a CAD class utilizing the facility and equipment of a private architectural firm during non-working hours. When resources became available the decision was made to acquire a CAD system that would be housed on campus. It was also determined that an occupational analysis would be conducted using the DACUM Process.

The first task was to identify resources to establish a panel to participate in the process. Ideally a panel consists of 8-12 expert workers in the occupation to be analyzed. The panel may also consist of managers or supervisors, however the worker to supervisor ratio should be approximately 4 or 5-1. It is important in identifying panelists that a broad range of application within the occupation is represented. In establishing our panel it became evident that the majority of CAD technicians are in public utility firms, government agencies or government contractors. In our particular community very few private firms were using CAD in their operation. The final makeup of the panel consisted of five members; two representing primarily supervision, two a combination worker/supervisor, and one full-time technician.

After the panel was convened they were provided with a description of the worker in the occupation being analyzed, in this instance a CAD technician. This description was developed by the instructional staff of the college. The description provided to the panel states: "...is a highly trained individual who must combine conventional drawing theory and methods with the appropriate use of an integrative CAD system. The specialist must be able to operate the total system; execute drawing assignments; change and execute

detailed drawings; and compose final drawings." The occupational description serves as the initial point of discussion for the panel and ensures that everyone has a clear understanding of the occupation or worker being analyzed. The panel is given latitude to modify the description or develop a new description that they feel would be more appropriate. Following a great deal of discussion the panel reached a consensus on a modified description which states: "A trained drafter who must combine conventional drawing skill, theory, and methods with the appropriate use of a CAD System. The specialist must be able to operate a basic CAD System, execute drawing assignments, charge and execute detailed drawings, and prepare final drawings."

Following the acceptance of the description the panel was then directed toward identifying the duties for the worker for the occupation. Duties are broad areas of responsibility of the occupation under which all specific tasks will fit. There are usually 8 - 12 duty areas for an occupation. As the panel discusses each duty and a consensus is reached the duty statement is written on an 8 1/2" x 11" sheet of paper and placed vertically on a wall.

For each duty statement appropriate tasks are identified and written on small sheets, i.e., 5" x 8". These are placed on the wall horizontally on

line with the appropriate duty. There are usually from 6 - 30 tasks associated with each duty.

After specific tasks have been identified for each duty, the duty and task statements are reviewed individually.

During this process changes are made to improve the clarity and preciseness of the statements. This may result in some statements being modified, and others dropped or added.

After refinement of the statements they are organized in a logical sequence which will provide a basis for curriculum development.

In the process of identifying and discussing duty and task statements, panel members will invariably discuss knowledge, attitudes, and equipment associated with the occupation. This information is not a part of the analysis of competencies required in the occupation; however, it should be retained as useful information for the curriculum development process. The information can be placed on a chalkboard or flip chart and distributed as supplemental information with the profile chart.

DACUM WORKSHOP

PANELISTS

William Y. Endow
Department Manager
EG&G/EM
P.O. Box 1912
Las Vegas, NV 89125
295-2857

Charles E. Feddersen
Engineering Section Chief
Holmes and Narver, Inc.
3355 Spring Mountain Road
Las Vegas, NV 89102
295-1513

Larry Karr
Engineering Draftsman
Bureau of Reclamation
P.O. Box 299
Boulder City, NV 89005
293-8375

Larry V. Snow
Drafting Supervisor
Nevada Power Co.
6226 West Sahara Avenue
P.O. Box 230
Las Vegas, NV 89151
367-5358

Lane Swainston
Architectural/Retrofit Coordinator
Clark County School District
2832 E. Flamingo Road
Las Vegas, NV 89121
736-5254

FACILITATORS

Charlotte Prickett
Research Assistant
Arizona Center for Vocational Education
Box 6025
Flagstaff, AZ 86011
(602) 523-4192

David Hoggard
Director, Technical and Occupational Education
Clark County Community College
3200 East Cheyenne Avenue
North Las Vegas, NV 89030

CLARK COUNTY COMMUNITY COLLEGE
DACUM OCCUPATIONAL ANALYSIS
COMPUTER DRAFTING TECHNICIAN

Definition: Computer Drafting Technician

A trained drafter who must combine conventional drawing skill, theory and methods with the appropriate use of a CAD system. The specialist must be able to operate a basic CAD system, execute drawing assignments, change and execute detailed drawings, and prepare final drawings.

I. Utilize Computer	Log on/off system	Select appropriate program	Utilize appropriate input/output device	Operate key-board proficiently	Maintain proper environment				
II. Manage Library of Symbols	Create and maintain symbol index	Create and use symbols	Create and use symbol menus						
III. Interpret Design Criteria	Establish Job and task scope	Interact with design team	Plan approach	Establish time frame					
IV. Prepare Preliminary Drawing	Identify components	Create data base file	Set screen/drawing parameters	Lay out the drawing	Utilize symbols	Utilize text	Select key dimensions	Produce check prints	Obtain approvals
V. Prepare Finished Drawings	Finalize drawing parameters	Modify drawing to conform to standards	Select final dimensions	Incorporate reference data and standard notations.	Select output parameters		Prepare finish check print	Produce final drawing	
VI. Maintain Support Files	Create and maintain drawing index	Create and maintain drawing files	Implement security procedure for protection of file media	Implement appropriate back-up procedure					
VII. Exploit System's Maximum Capabilities	Learn system capabilities	Communicate system capabilities	Apply knowledge to achieve maximum proficiency						
VIII. Troubleshoot System Problems	Identify problem	Document problem	Resolve minor problems	Refer to appropriate help sources					
IX. ust Remain rent in Field	Participate in user groups	Access vendor updates	Participate in professional associations	Continue education	Use current publications				