Skills Based Curriculum Development

John Johnson
Curriculum Consultant

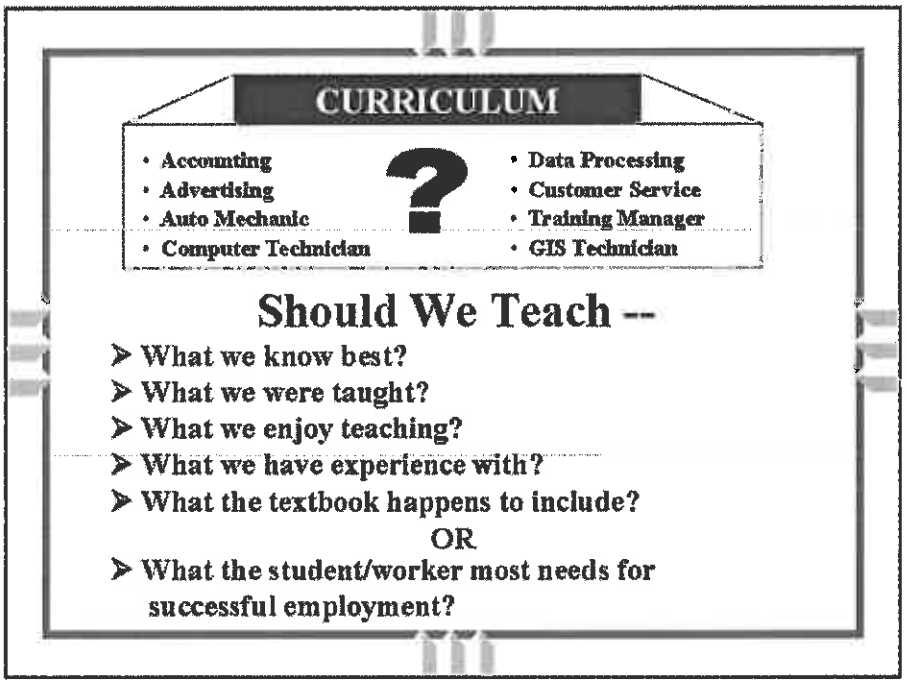
Common Curriculum Errors

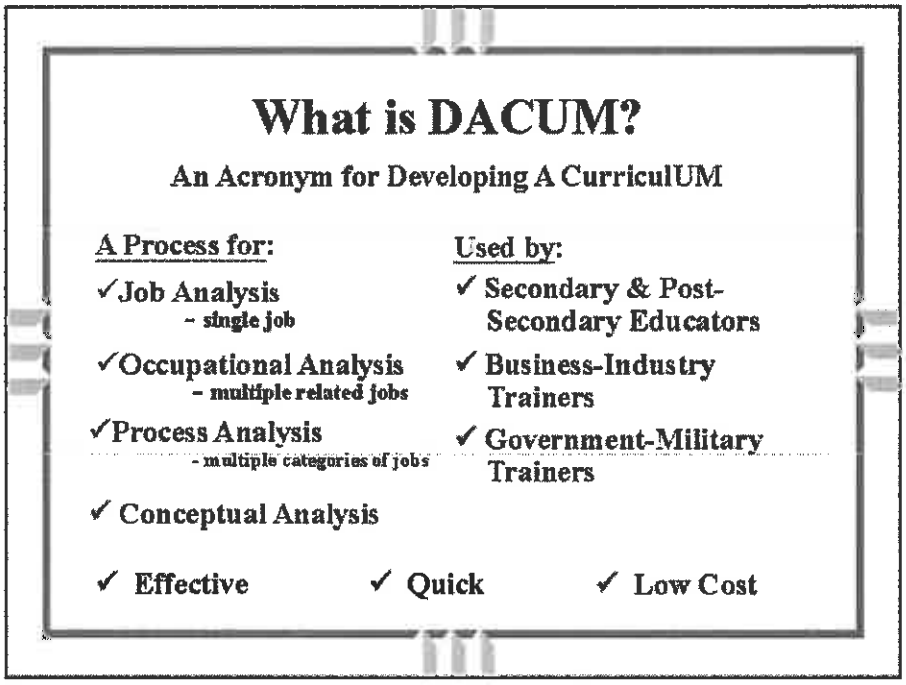
- **Failure to teach WHAT should be taught**

  (e.g., the latest skills & concepts)

- **Teaching WHAT should not be taught**

  (e.g., outdated skills & equipment)


CURRICULUM
• Accounting
• Advertising
• Auto Mechanic
• Computer Technician
?
• Data Processing
• Customer Service
• Training Manager
• GIS Technician
Should We Teach --
➢ What we know best?
➢ What we were taught?
➢ What we enjoy teaching?
➢ What we have experience with?
➢ What the textbook happens to include?
OR
➢ What the student/worker most needs for successful employment?


What is DACUM?
An Acronym for Developing A CurriculUM
A Process for:
✓Job Analysis
- single job
✓Occupational Analysis
- multiple related jobs
✓Process Analysis
- multiple categories of jobs
✓ Conceptual Analysis
Used by:
✓ Secondary & Post-Secondary Educators
✓ Business-Industry Trainers
✓ Government-Military Trainers
✓ Effective
✓ Quick
✓ Low Cost

Who Uses DACUM?

- American Electric Power
- AT & T Wireless
- Boeing
- Cingular Wireless
- Coors Brewing
- Eastman Kodak
- Ericsson
- Honda
- John Deere
- General Mills
- University of Pennsylvania
- Oklahoma State University
- University of Central Florida
- Lucent Technologies
- Motorola
- Sterling Commerce
- UAW Ford
- United Airlines
- Walt Disney World
- Westinghouse
- Johnson and Wales
- Ohio State University
- North Dakota State
- Bowling Green State
- Temple University

DACUM Philosophy

- Expert workers can describe and define their job more accurately than anyone else.
- An effective way to define a job is to precisely describe the tasks that expert workers perform.
- All tasks, in order to be performed correctly, demand certain knowledge, skills, tools, and worker behaviors *(enablers)*

The DACUM Process

3

DACUM Workshop

- ~12 expert workers
- Hotel Conference room
- 2 days
- Meals & Refreshments
- Facilitator
- Note Taker

DACUM Procedure

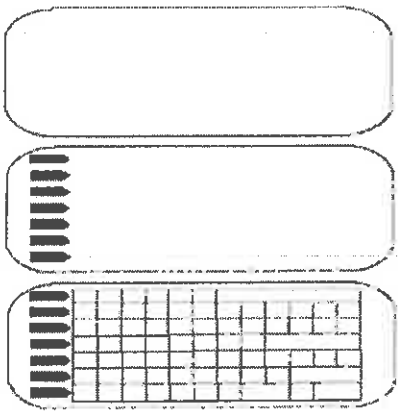
1. Orient the committee
2. Review the job/occupation
   - A) Develop Organizational Chart
   - B) Conduct initial brainstorming
3. Identify duties (general areas of responsibility)
4. Identify specific tasks performed
5. List:
   - A) General knowledge & skill requirements of the job
   - B) Worker behaviors (desirable attitudes and traits)
   - C) Tools, equipment, supplies, and materials
   - D) Future trends/concerns
6. Review/refine task and duty statements
7. Sequence the task and duty statements
8. Rank the duty & task statements (Tech I, Tech II, Tech III)

Graphic Representation of Job, Duty, and Task Relationships

Whole Job

Job Divided into Duties (6-12)

Job Divided into Duties & Tasks (75-125)



Job, Duty, Task, and Step Examples

JOB	- Homeowner
DUTY	- Maintain the yard
TASK	- Mow the lawn
STEP	- Start the mower

JOB	- Homemaker
DUTY	- Prepare meals
TASK	- Bake cookies
STEP	- Mix ingredients

Key Terms

- **Duties** — A cluster of related tasks
  - Usually 6-12 per job
- **Tasks** — Specific meaningful units of work
  - Usually 6-20 per duty and 75-125 per job
- **Steps** — Specific elements or activities required to perform a task
  - Always two or more per task

Duty Statement Criteria

Duty Statements :

- ⌘ Describe large areas of work in performance terms
- ⌘ Consist of one verb, an object, and usually a qualifier
- ⌘ Stand alone (are meaningful without reference to the job)
- ⌘ Serve as title for a cluster of related tasks (usually 6-20/duty)
- ⌘ Are general, not specific, statements of the work that is performed (usually 6-12/job)
- ⌘ Avoid references to workers behaviors, tools, and knowledge needed

Sample Duty Statements

- ◆Create / Acquire Data
- ◆Maintain / Manage Data
- ◆Analyze Data
- ◆Technical Support
- ◆Generate Products
- ◆Manage Projects

Job Task Criteria

Job Tasks:

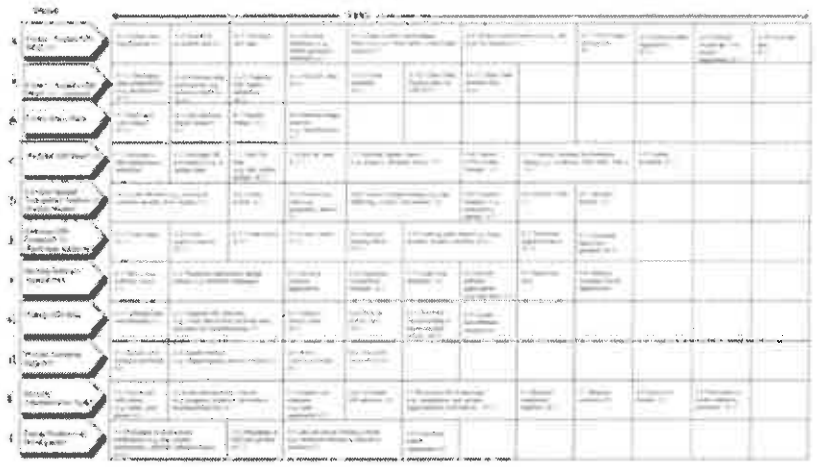
- Represent the smallest unit of job activity with a meaningful outcome
- Result in a product, service, or decision
- Represent an assignable unit of work
- Have a definite beginning and ending point
- Can be performed over a short period of time
- Can be observed and measured
- Can be performed independent of other tasks
- Consist of two or more steps

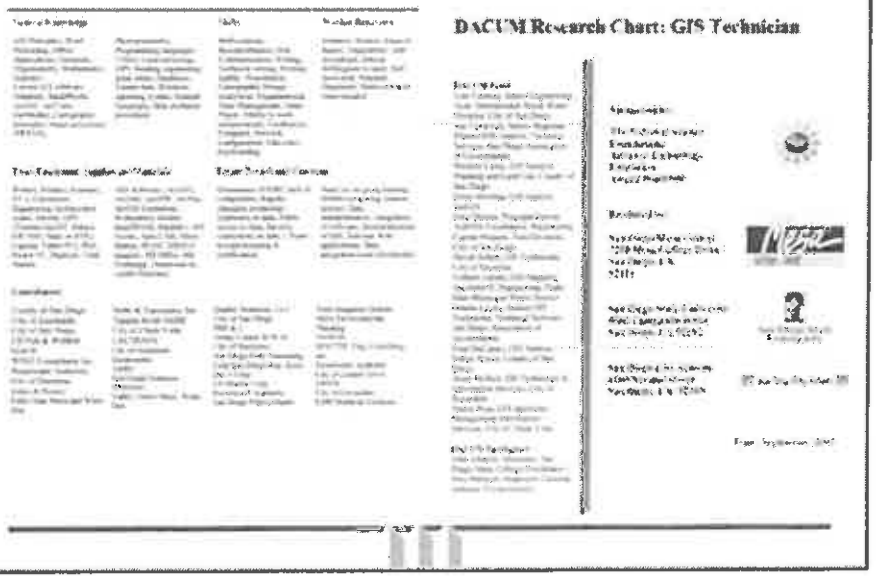
eg

Sample Task Statements

- Create maps
- Geocode address data
- Refresh / replace layers
- Edit GIS data
- Develop databases
- Write / review technical reports

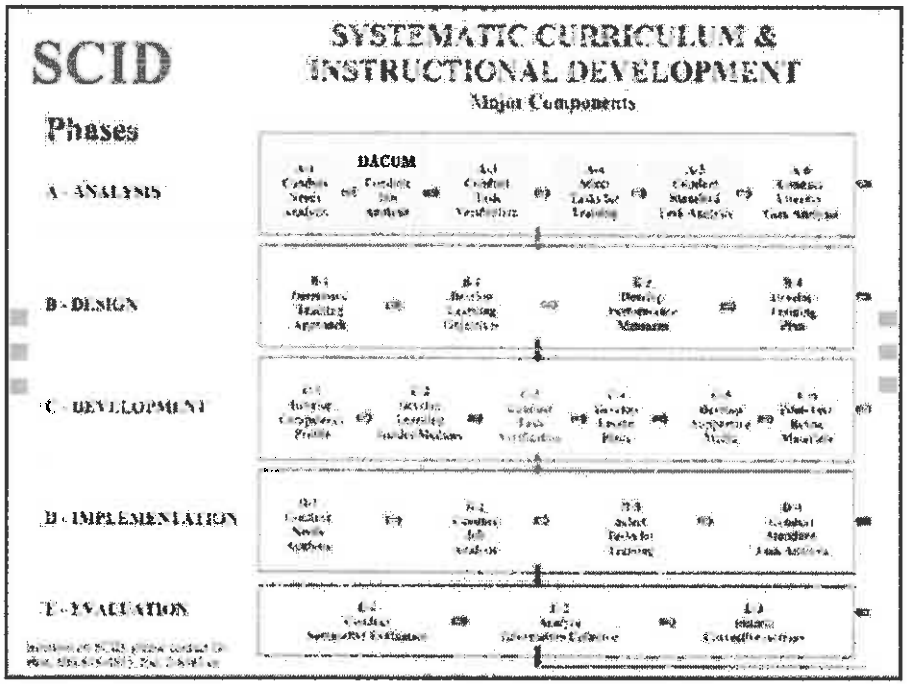
Sample DACUM Chart

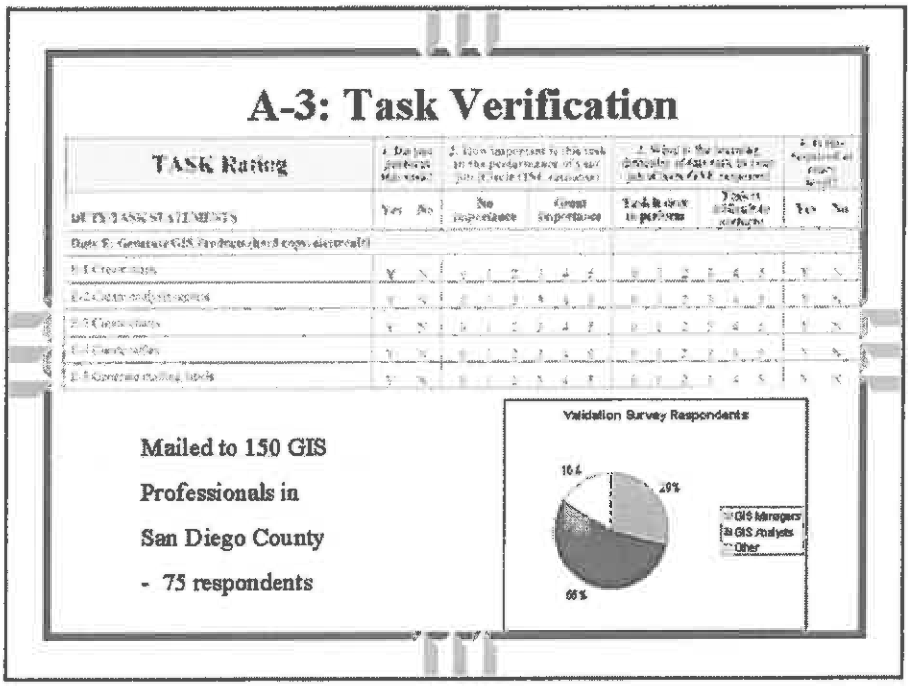


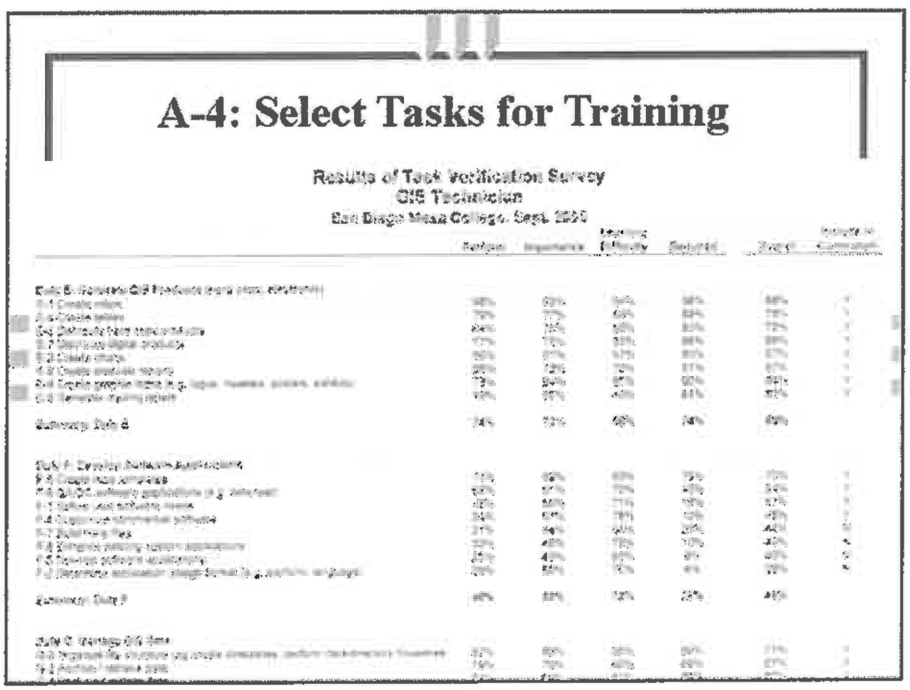


DACUM Advantages

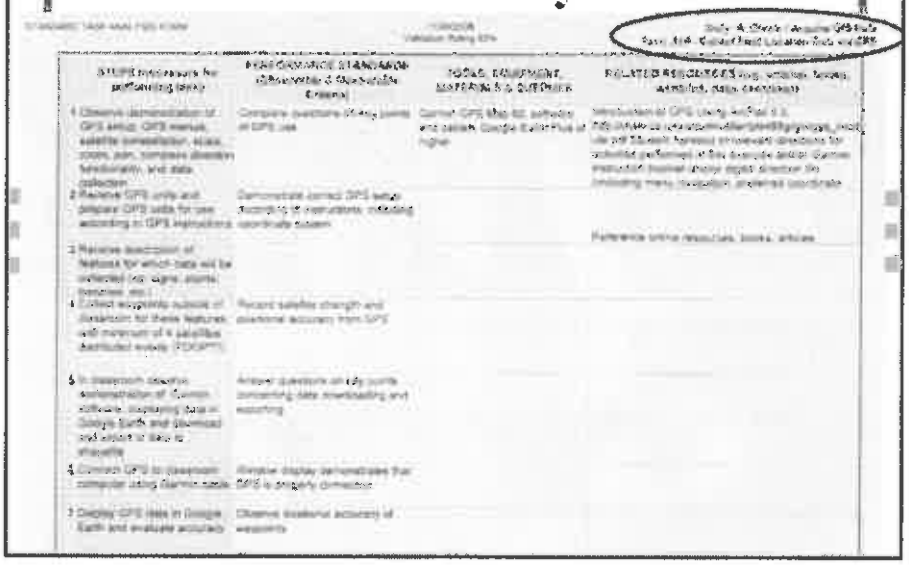
- Employee involvement and buy-in
- Use of Expert Workers / Panel members
- Efficient: 2 days vs. 6 weeks
- Specific vs. general job specifications
- Identification of critical tasks
- Opportunity for brainstorming & sharing ideas
- Group Consensus / Synergy
- Solid foundation for the Curriculum Development Process




A-3: Task Verification
TASK Rating
Validation Survey Respondents
GIS Managers
GIS Analysts
Other
Mailed to 150 GIS
Professionals in
San Diego County
- 75 respondents


A-4: Select Tasks for Training
Results of Task Verification Survey
GIS Technician

A-5: Task Analysis



Phase B: Curriculum Design

- **B-1: Determine Training Approach**
  - Performance/Competency Based
- **B-2: Develop Learning Objectives**
  - Translate Tasks/Competencies into Objectives (sequence)
- **B-3: Develop Performance Measures**
  - Knowledge & Skills Assessment tools
- **B-4: Develop Training Plan**
  - Curriculum Approval

B-1: Determine Training Approach

Competency Based Program

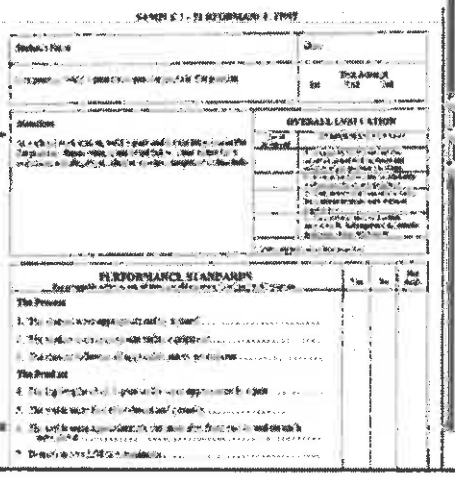
- Competencies must be made public
- Criteria for assessment must be clear
- Accommodate different learning styles & abilities
- Task performance is primary method of assessment
- Learners progress at their own speed

B-2: Develop Learning Objectives

- **Performance Objective**:
  - specifies final outcome of an instructional activity
  - Eg: *Given a Garmin GPS Map 60 and ArcGIS, collect site locations for xxx and display these on a cartographly correct map showing xxx*
- **Enabling Objectives**:
  - Support achievement of Performance Objective
  - *Eg: gain knowledge of: (1)Garmin GPS Map 60, (2)cartography, (3)data transfer to ArcGIS*

B-3: Develop Performance Measures

- **Knowledge Assessment**
  - Testing
- **Skills / Performance Assessment ***

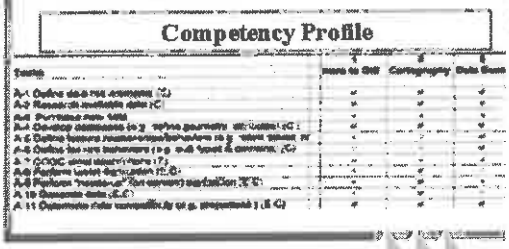


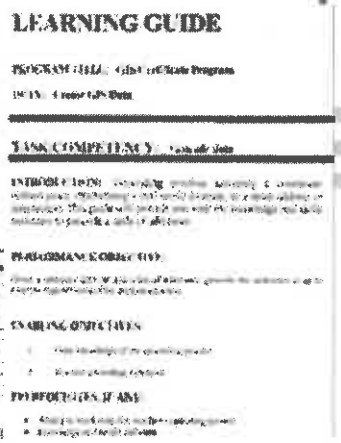
B-4: Develop Training Plan

- **Curriculum Approval**
- **Budget**
- **Tools, Equipment & Supplies**
- **Student Recruitment**
- **Staffing**

C: Curriculum Development

- C-1: Develop Competency Profile
  - Map Tasks to Modules / Courses
- C-2: Develop Learning Guides
- C-4: Develop Supportive Media
- C-5: Pilot Test





Phases D & E: Implementation & Evaluation

- Faculty Training
- Evaluate Feedback
- Document Results
- Program Update & Improvement