

# Linking Competencies and Curricula

Presentation to the Faculty and Students  
of National Tsing Hua University

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## Learning Objectives

- At conclusion of this workshop, participants will be able to
  - Describe the components of DACUM
  - Describe how competency-based curricula supports labor market needs
  - Describe the difference between a competency, an outcome, an objective, and a goal.
  - Describe alternative structures for documenting student learning including portfolios, career transcripts, etc.



## This presentation is informed by

- National Postsecondary Education Cooperative Project: Data Ramifications of Competency-Based Initiatives
- New Directions for Institutional Research: Measuring What Matters: Competency-Based Models in Higher Education, July 2001

## NPEC Report

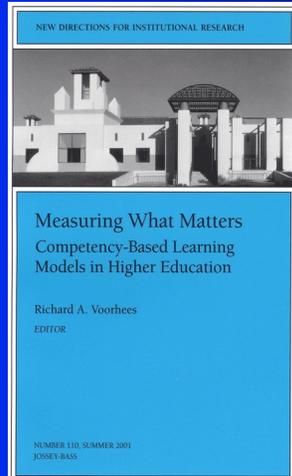
- Defining and Assessing Learning: Exploring Competency-Based Initiatives (U.S. Department of Education, 2001)
  - <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002159>
- Defines and Classifies Competency-Based Initiatives
  - Pre-postsecondary education
  - Within postsecondary education
  - After postsecondary education

## NPEC Report

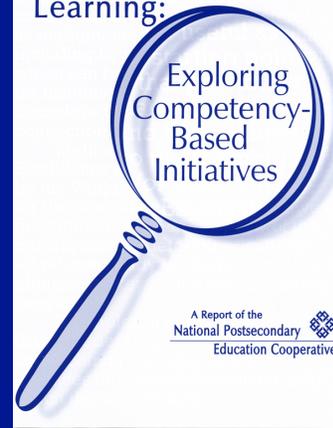
- 8 Case Studies and abstracts
- Identification of Strong Practices
- An annotated bibliography of competencies

## A Short History of Competencies

- Popular in the United States in the 1970s in the performance-based vocational teacher education movement
- Competency approaches rode a new wave in the 1990s
  - National Vocational Qualifications (NVQs) system in England and Wales (begun in 1986),
  - New Zealand's National Qualifications Framework
  - Competency standards endorsed by Australia's National Training Board (NTB)
  - The Secretary's Commission on Achieving Necessary Skills (SCANS) and the National Skills Standards initiative in the United States.



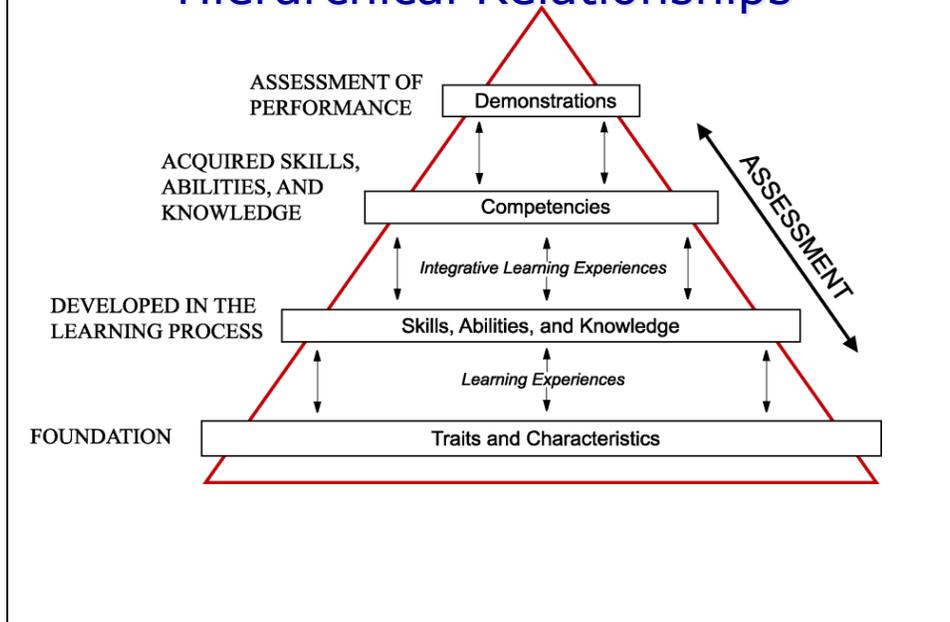
## Defining and Assessing Learning:



## What is a competency?

- Alternate, interchangeable definitions abound
- Objectives, skills, outcomes, goals, output, achievement, ability, result, proficiency
- NPEC Workgroup's definition:
  - **A competency is "a combination of skills, abilities, and knowledge needed to accomplish a specific task"**

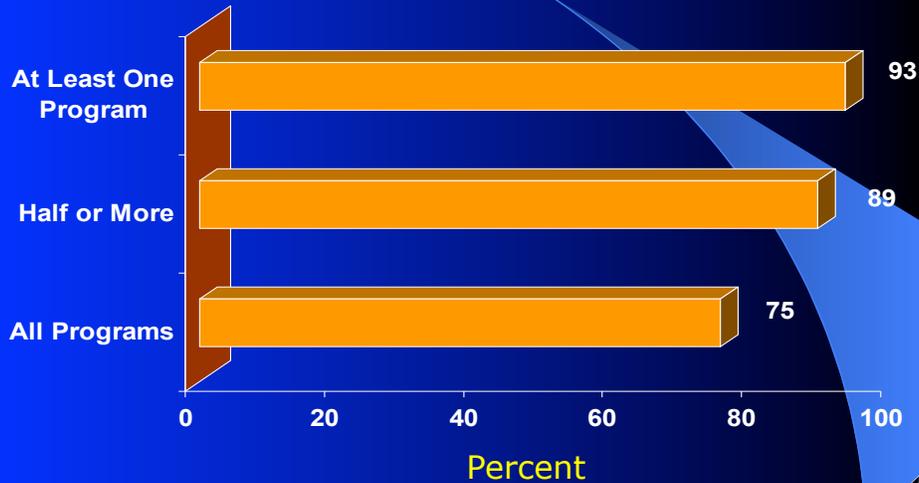
## Hierarchical Relationships



## Why Should You Care?

- First and foremost, competency-based initiatives operate in the best interest of students and alumni.
- A framework for ensuring quality
  - All states recently received an "Incomplete" grade for student learning.
  - All states lack "information on the educational performance of college students that would permit systematic state or national comparisons."

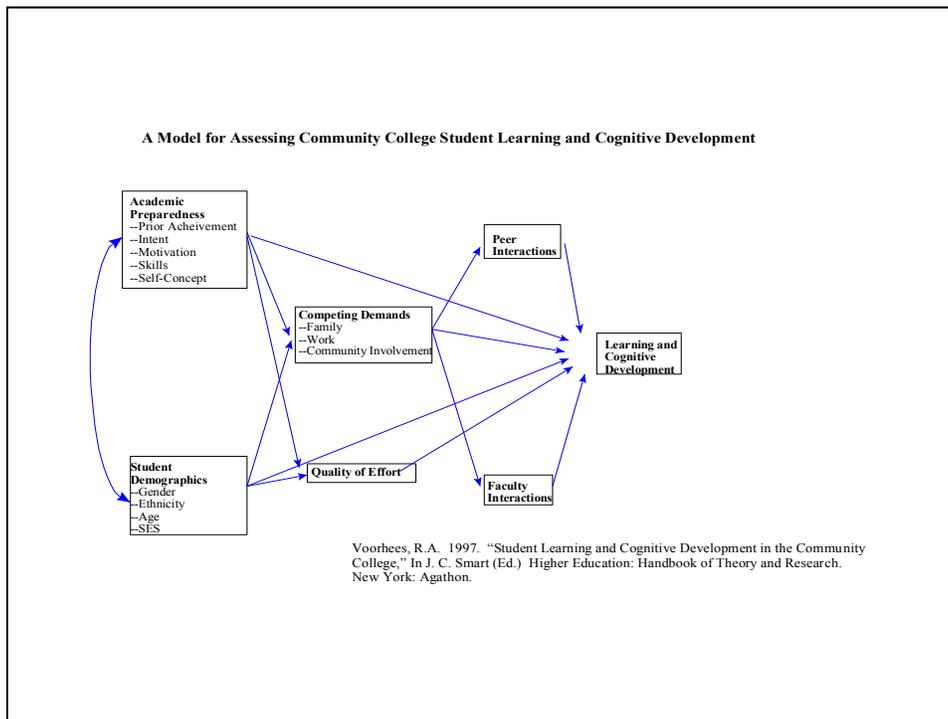
### Use of Skill Competency Lists, 2-Year and Less Than 2-Year Institutions



Source: NCES, 1999

### Learning is complex

- We don't know much...fewer than 10 states administer a common test to a large number of college students (Ewell, 2000)
- Agreement on core skills
- Political willpower
- Creation of accurate measurements
- Student motivation



## And.....?

- ➔ Growing number of partnerships between e-learning vendors and academic institutions
- ➔ The monetary value of online markets is expected to grow to
  - ➔ \$7 billion for U.S. post-secondary education
  - ➔ \$11.4 billion for U.S Corporations
  - ➔ \$365 billion for the global e-learning market

Source: Web-based Education Commission 

## So....

- In 1985 there were 400 Corporate Universities; today there are 1,000 (Dolence, 2001)
- 78.9 percent of advertised postings for information technology workers did not mention a degree requirement (Adelman, 2000)
- MIT has made instructional materials for all its courses available free

## How Fearsome is the Competition?

- It is estimated that 1.9 million certifications were awarded in information technology by the year 2000 (Adelman, 2000)
- More than 54,000 individual courses available through distance education (U.S. Department of Education, 1999)

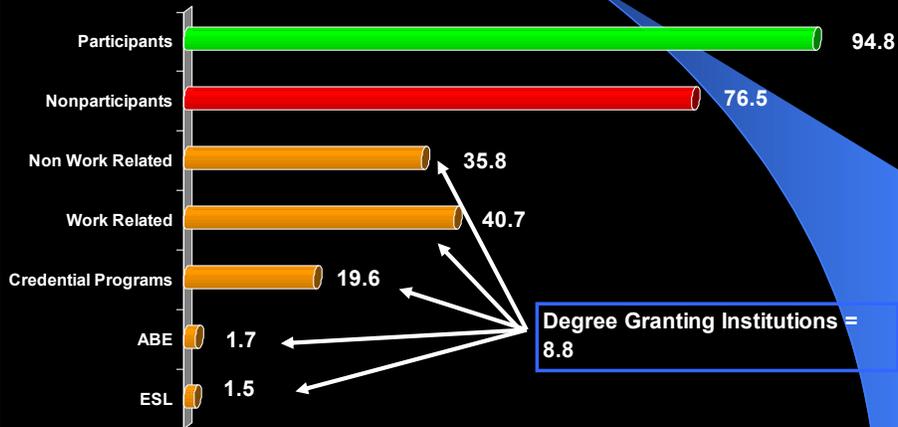
## Early Stages of a Learning Revolution

- Performance-based learning
- Learning pathways no longer lead automatically to institutions of higher education

## Early Stages of a Learning Revolution (continued)

- Intense competition from organizations whose sole purpose is to deliver learning anytime and anywhere... m-learning
- Employers and employees want the shortest route to results
- It is likely that performance-based outcomes will drive the assessment of quality in fundamental ways

## Adults in Formal Learning in the US



## What's in it for learners?

- Integrate credit and non-credit offerings
- Learning bundles
- Individualized instructional approaches or systems emphasize small, modularized units of content
- Learners can master one unit before moving to the next, while giving immediate and frequent feedback, and engaging the learner actively in the learning process
- Providers that accentuate **portability** are likely to thrive

## In the US, The “Credit Hour” is Still King

- Default packaging learning in standard length terms and traditional delivery formats
- The concept of “seat-time” continues to dominate the 7,000 pages of federal financial aid rules
- Predominant public funding allocations are built on time, not outcomes

## Working with Faculty

- Major transformation in mindset and practice
- Work to identify and define specific competencies
- Validation of competencies. Are they essential?
- DACUM and Delphi Approaches for consensus building

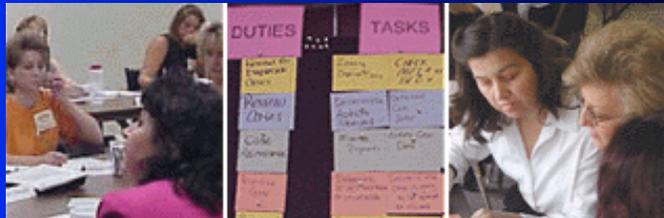
## DACUM (Developing a Curriculum)

- Expert workers can describe and define their jobs better than anyone else. (High quality analysis of competencies)
- Important competencies can be identified by describing tasks that expert workers perform (wide range of tasks)
- Employee tasks require a combination of knowledge, skills, tools, attitudes, and behaviors

## DACUM (Continued)

- 6 to 12 experts
  - Identify general areas of responsibility
  - pinpoint tasks performed in each duty area
  - Review and refine tasks and duty statements
  - Sequence tasks
  - Identify entry-level tasks
  - Articulates essential behaviors, attitudes, and knowledge
- Produces a DACUM chart for 2<sup>nd</sup> review
- Result is a validated job model

## Storyboarding Process



Picture Source: DACUM Website

## Measuring and Reporting Competencies

- Internal and External consumers
- Simple measurement is not enough; quality and range of competencies need to be communicated clearly
- Competencies must be assessable
- Consistency in writing competency statements...particularly across levels
- Reliability and validity

## Standard Setting and Bookmarking

- Competency testing has become a high stakes activity
- National tests can be used to set competency levels or standards
- Bookmarking is a technique for establishing technically sound thresholds
- Expert panels of judges

## Regional Accreditation and Distance Education

- Links between competencies and accreditation is growing tighter
- The accent is on documentation of student learning
- Six regional associations have promulgated these expectations
- Distance education activity appears to be the prime driver

## Resources for Creating and Implementing Competency-Based Models

- Models and compilations are available on the Web to guide institutions
- SCANS 2000, National Skill Standards Board
- Wisconsin Instructional Design System
- General Education
  - Alverno, Rutgers, Trait-based scales
- Colorado Community College Course Numbering and Competency System (CCCNS)  
[www.cterc.cccs.edu/ccns](http://www.cterc.cccs.edu/ccns)

## Teaching Goals Inventory

- The Teaching Goals Inventory (TGI) is a self-assessment of instructional goals. Its purpose is threefold:
  - (1) to help college teachers become more aware of what they want to accomplish in individual courses
  - (2) to help faculty locate Classroom Assessment Techniques they can adapt and use to assess how well they are achieving their teaching and learning goals; and
  - (3) to provide a starting point for discussion of teaching and learning goals among colleagues.
- <http://www.uiowa.edu/~centeach/tgi/>

## Results, Teaching Goals Inventory Online

This table contains your results. The third column contains the percentage of items within each cluster that you rated "essential." The fourth column contains the average rating you assigned to items within each cluster.

Cluster	Goals Included in Cluster	Percent Rated "Essential"	Mean Rating
I. Higher Order Thinking Skills	1-8	25%	3.63
II. Basic Academic Success Skills	9-17	11%	3.44
III. Discipline-Specific Knowledge and Skills	18-25	38%	4.13
IV. Liberal Arts and Academic Values	26-35	30%	4.00
V. Work and Career Preparation	36-43	50%	4.38
VI. Personal Development	44-52	22%	3.44

## Differences In Teaching Goals Between Types of Institutions

**Table 10.3\***  
Mean Cluster Ratings (M) and Percent (%) "Essential" Ratings

TGI Cluster	Four-Year Colleges		Community Colleges	
	M	%	M	%
I. Higher order thinking skills	3.05	43	3.09	45
III. Discipline-specific	2.86	37	2.83	36
VI Personal development	2.28	25	2.41	28
V. Work and career	2.27	21	2.50	26
IV. Liberal Arts	2.16	21	2.02	18
II. Basic Skills	2.12	18	2.29	22

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## Strong Practices in Competencies

- A senior administrator is the public advocate, leader, and facilitator for creating an institutional culture that is open to change, willing to take risks, and fosters innovations by providing real incentives for participants.
- Appropriate stakeholders fully participate in identifying, defining, and reaching consensus about important competencies.
- Competencies are clearly defined, understood, and accepted by relevant stakeholders.

## Strong Practices in Competencies (Continued)

- Precision, reliability, validity, credibility, and costs are all considered and examined in making selections about the best commercially-developed assessments and/or locally-developed assessment approaches.
- The competency-based educational initiative is embedded within a larger institutional planning process.
- Assessments of competencies are directly linked with the goals of the learning experience.

## Strong Practices in Competencies (Continued)

- The assessment results are used in making critical decisions about strategies to improve student learning.
- The assessment results are clear and reported in a meaningful way so that all relevant stakeholders fully understand the findings.
- The institution experiments with new ways to document students' mastery of competencies that supplement the traditional transcript.

## Some Going Away Observations

- False assumption that skills are like building blocks. Human beings--even small children--are sense-making, problem-solving animals.
- Skills are often taught in isolation; learners get little practice in applying and combining skills.
- Educators often depict learners as passive receptacles into which knowledge may be "poured." But learning actually occurs when the learner constructs, invents, and solves problems.
- Learners bring their own conceptions to the learning situation. Traditional curriculum design usually is based on an analysis of the subject matter that ignores what is already in learners' heads, with the result that students can play back memorized knowledge and conceptions but return to their own ideas when confronted with unfamiliar questions or non-routine problems.
- Knowledge and skills are often taught in ways that do not replicate the settings in which the work must be performed.

## What Challenges are Ahead?

- Assessment of competencies with consistency
- Fear of change. Cultural history
- Student engagement
- Joint curriculum development with secondary schools
- Reward structures

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