

Summer 2008



Perkins IV and DACUM--Developing Local or Statewide Industry Skill Standards

The Perkins IV legislation calls for the development of “programs of study” at both the secondary and the post-secondary levels that are aligned with “industry-recognized standards.” If you want to align your occupational programs with local or statewide industry standards, DACUM is a process that you should seriously consider. The DACUM process for occupational analysis involves expert workers from several employers from your labor market area. These workers can explain precisely WHAT they DO. The process also captures the general knowledge and skills required of successful workers, the worker behaviors considered essential, the tools and equipment needed, and the future trends and concerns of the occupation.

When the 2-day workshop process is completed, you will have accurate information from the experts who do the work. The duties and tasks identified by the workers form a solid research base upon which relevant curriculum can be developed or existing curriculum revised. Typically, 6-12 duties and 75-125 tasks are identified for each occupation. These industry identified skill standards can also become a solid basis for Perkins mandated student technical skill assessments.

The DACUM panel of 5-10 experts work under the guidance of a trained facilitator who is a process expert while the workers serve as the content experts. The process does not rely on literature or external sources but utilizes brainstorming and consensus seeking techniques to precisely define what the “local experts” actually do that makes them so successful. This type of analysis provides the type of industry recognized standards called for by the Perkins legislation. It also elicits the support of local industry leaders as their own employees are involved in a substantive way in helping your instructors decide what to teach so as to meet their needs.

The DACUM process can also be used to conceptualize the content of emerging occupational programs where there are no or very few expert workers. A few of the emerging occupations recently analyzed include mechatronics, shelter medicine specialist, and sustainable architectural designer. The process has been successfully used to analyze occupations at the skilled, technical, supervisory, managerial, and professional levels.

DACUM workshop participants have described the process as “amazingly effective”; “comprehensive”; “focused, accurate, realistic”; “quick and concise”; and “effective, efficient, and valuable.” It’s a low cost and great process that really works!

Many community and technical colleges, well-known companies, and government agencies, both domestically and internationally, have used and are using the DACUM process to develop and/or improve their instructional programs. The Center on Education and Training for Employment offers a variety of DACUM-related services including facilitating such workshops and conducting facilitator training institutes in Columbus, Ohio, as well as at the sponsor location. For more information, please see www.dacumohiostate.com or contact Bob Norton at 614/292-8481, norton.1@osu.edu, or John Moser at 614/247-7989, moser.120@osu.edu.

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Program for Acquiring Competence in Entrepreneurship (PACE) Update

We are pleased to report the successful launch of the fourth edition of PACE, <https://www.cete.org/Director/PACE.asp>. The latest edition of PACE was released this past summer and already has been adopted by a number of educational settings: career center, adult programs, and community colleges. Because of its module-format, users report that PACE seems to work best when it used flexibly as a supplement text.

Here are some ways that PACE has been used:

- The program might be used as a stand-alone for a self-paced program.
- The program might be used as the lecture prompts for a classroom-based program.
- Some modules might be used to complement an existing program.
- Some creative combination of the above situations.

In addition, we are pleased to announce that CETE has entered into licensing agreements with international organizations, such as in South Africa, which allows PACE to be adapted to match the learning needs of a local population. For example, e-commerce has been extremely popular among emerging entrepreneurs in South Africa, but their context, the terms, and the items they sell differ greatly from that in the U.S. We are pleased that PACE will be adapted to better their situation.

Finally, CETE can provide train-the-trainer services to support the use of PACE. That is, we can train your instructors to use the program and to implement a broader-scope plan for small business and entrepreneurship development.

For more information about using PACE or entering into licensing agreements, please contact Ronald L. Jacobs at jacobs.3@osu.edu or call 614/292-9943.

There are several options in purchasing PACE:

- PACE Fourth Edition, Complete Set, CD-ROM PDF Format \$49.95
- PACE Fourth Edition, Complete Set, Print Format \$225
- PACE Cluster A, 4 Modules, Print Format \$41
- PACE Cluster B, 8 Modules, Print Format \$82
- PACE Cluster C, 10 Modules, Print Format \$102
- Individual modules, \$17 each

TtT and KNOTtT Presentations

Belinda Gimbert and Maria Moore presented “Continuous Improvement toward a Blended Model of Preparation for State-Mandated Licensure Tests: A New Day for Alternate Routes to Learning for Teachers” on April 4, 2008 at the National Association for Alternative Certification in Atlanta, Georgia. Information for the presentation was derived from an evaluation study conducted on data gathered during the Ohio Transition to Teaching project. The purpose of this study was to investigate the performance of Ohio teachers on a state-mandated licensure test, the Praxis II: Principles of Learning and Teaching (PLT) Grade 7-12. The three groups of Ohio teachers included (1) those participating in the Ohio Transition to Teaching (TtT) project on an Alternative Educators License (AEL), who received test preparation support through a blended online learning approach; (2) other AEL teachers who did not receive the test preparation treatment; and (3) traditionally trained teachers who were certified to teach by state approved Ohio Institutes of Higher Education (IHE) programs.

Results suggest that AELs participating in Ohio TtT performed better on the PLT than other Ohio AELs, and did as well as those coming from traditional higher education programs. Controlling for demographic variables, group mean test scores indicated that the blended test preparation support did make a difference for teachers who experience a nontraditional teacher training program that embeds a blended model of test preparation.

KNOTtT: Strengthening Systems Capacity Collaboratively with Kansas, Nevada, Ohio, and Texas

Project KNOTtT has had a very successful first year. Effective April 30, 2008, 104 participants have been selected for participation in Cohort One across partnering states and LEAs. KNOTtT Cohort One (officially designated for funding during Budget Year 2) will begin as new teachers of record in the school year, 2008-2009. We anticipate that the remaining available 21 places that will complete Cohort 1 will be filled by August 31, 2008. Over the 5 years of the project, Project KNOTtT will recruit, train, place, and retain 545 teachers in academic subject areas, including math, science, language arts, foreign language, ESL, and special education using online resources, interactive conferences, and a stipend of \$3,000 per KNOTtT participant.

All orders under \$75 add \$8 for shipping and handling; orders over \$75 add a 12% shipping and handling fee. For more information on ordering PACE, contact Judy Cohen at 614/292-8320 or cohen.5@osu.edu or Steve Chambers at 614/292-6991 or chambers.2@osu.edu.

LearningWork Connection Publications

Coming Soon

Focused Futures: Youth Development System Builder features user-friendly information, real-world examples, and customizable tools to help Workforce Investment Act (WIA) youth program professionals design and implement successful programs for WIA. Full-text PDF files for two new modules will be available at <http://www.learningworkconnection.org/focusedfutures.asp>.

- Developing an Individual Service Strategy (ISS)
- Objective Assessment

What Works: Shared Vision for Youth. The U.S Department of Labor's Employment and Training Administration has developed a new strategic vision to serve at-risk youth through better communication, coordination, and collaboration among federal, state, and local workforce development, education, and economic development systems, youth-serving organizations, and employers. This selection of reprinted resources describes strategies to increase the likelihood of success of youth who need the most help to realize their dreams—drop-outs, foster youth, juvenile offenders, children of incarcerated parents, migrant youth, Indian and Native American youth, and youth with disabilities.

A full-text PDF file will be available at <http://www.learningworkconnection.org/whatworks.asp>.

New Youthwork Information Briefs

Youthwork Information Briefs summarize information from a variety of references into an easily absorbed document replete with real-life examples, practice tips and techniques, and complete bibliographies.

- Registered Apprenticeships
- Juvenile Justice and WIA Youth Services
- Multiple Education Pathways
- Effective Numeracy Instruction for Out-of-School Youth

Full-text PDF files are available at <http://www.learningworkconnection.org/youthwork.asp>.

Ohio WIA youth system staff can obtain paper copies of these new publications by contacting Mike Wonacott at wonacott.2@osu.edu or 614/688-3356.

Bob Norton Achieves Emeritus Status



Dr. Bob Norton, DACUM and SCID Program Director, was awarded the title Professor Emeritus by The Ohio State University Board of Trustees on April 1, 2008.

Raised on a dairy farm in northwest New York, Dr. Norton earned his bachelor's, master's and doctorate degrees from Cornell University. Bob began his employment with Ohio State in 1971 as an assistant professor in what was then the Department of Agricultural Education specializing in competency-based education.

Much of his work in those early years focused on preparing vocational teacher education modules for the Performance-Based Teacher Education (PBTE) program.

Bob has spent the greater part of his career developing the DACUM (Developing a Curriculum) and SCID (Systematic Curriculum and Instructional Development) training programs at the Center on Education and Training for Employment. He has conducted over 450 two-day DACUM workshops since 1976 for businesses and educational institutions. Since 1982, Bob has conducted over 275 week-long DACUM Institutes that have trained over 4,000 persons from 42 countries as DACUM facilitators. He has also conducted over 125 five-day SCID training classes. His work-related travels have taken him to 24 countries. Bob has written countless articles and spoken at conferences internationally on topics related to competency-based education.

After 37 years, Bob officially retired last September from OSU but continues to work half time as Director of the DACUM and SCID programs. His colleague, John Moser, works closely with him as the Associate DACUM and SCID Program Manager.

Bob and his wife, Judy, have three grown children and two grandchildren. He continues as an active member of the Upper Arlington, OH chapter of Optimist International and also serves as Vice President for North America for the International Vocational Education and Training Association (IVETA).

All of his associates at CETE congratulate Bob on this achievement and wish him continued success in his distinguished career at Ohio State. Bob can be reached by e-mail at norton.1@osu.edu or by phone at 614/292-8481.

What Is Technical Skill?

James T. Austin

Following up a previous summary of Perkins IV assessment implications, this article discusses technical skill, which is important across the career-technical education sector given its prominence in the Carl D. Perkins legislation reauthorized in 2006. The addition of technical skill to accountability reporting by the states creates a need for clarification to enhance communication within workforce development and to consider methods of identification for test development.

Introduction

Relevant technical skills are used in designing CTE curriculum, instruction, and tests. In the broadest sense, the “program of study” outlines content—technical knowledge and skill—and sequence to be incorporated into the CTE curriculum. CTE at the secondary level, it should be noted, is also responsible for NCLB academics. In this article I define technical skill by drawing upon insights from cognitive psychology applied to education, the credentialing community, and psychometrics. The latter is important in creating defensible item banks to evaluate technical skill domains at multiple levels for informed decision making.

Knowledge-Skill-Ability

Classic terms in the literature on testing cognitive capabilities are ability, knowledge, and skill. Ability, while important, is of less interest for this article. Knowledge and skill, within a work domain (defined at the cluster, pathway, or specialization levels), refer to technical facts/concepts and to behavioral sequences, respectively. From cognitive science, knowledge “forms” or categories are increasingly important. The 2001 revision of the Bloom et al. (1956) taxonomy, an excellent source, crossed six levels of cognitive objectives with factual, conceptual, procedural, and metacognitive forms of knowledge. One goal for CTE to demonstrate impact is to show that the curriculum engages students at higher levels of the objectives across these forms of knowledge, due to contextual elements of learning and instruction.

Primarily, knowledge means facts and concepts in the declarative domain. Consider the agricultural domain for cluster, pathway, and occupation/specialization as one example to illustrate this concept at multiple levels—what are facts and concepts at the cluster level? Likewise, what constitutes knowledge at pathway and occupation/specialization levels? Consider a refinement example that begins with broadly relevant material then cascades toward increasing specificity.

Facts and principles at the cluster level, here Agriculture, Food, and Natural Resources, would pertain to careers, associations, safety, tools, and plant/animal systems. Here the Occupational Information Network (O*Net) offers a set of 33 knowledge statements in a downloadable questionnaire format (www.onetcenter.org/questionnaires.html). The questionnaire can be applied to ANY system of standards or tasks, for example the national Career Clusters Initiative or state or even local skill standards. The questionnaire is used to document both importance and level or depth of knowledge required for a duty or a task.

When moving down a conceptual level, consider pathway programs-of-study defined by the national FFA. Food Products and Processing Systems is one such pathway. Knowledge components at this intermediate level represent a refinement of facts and concepts, for example, from very general safety or plant systems concepts down to the specialized yet still broad food domain. The former (safety) might include knowledge of food-borne illness through infectious agents (Salmonella, Botulism) or prevention (HACCP; Hazards Analysis Critical Control Points). Examples pertinent to plant systems might include grains or heirloom plants for niche food preparation.

Or, at the occupation/specialization level, consider occupations within the Food Products and Processing Systems pathway. Specifically, Meat Processor and Dietitian represent two career-oriented domains featuring the most specific bodies of knowledge for safety in the context of food. CETE staff has noticed that alignment or linkage of knowledge/skill to specific occupational tasks is often overlooked.

Skill and Competence

The term skill, and its cousin competence, implies the integration of factual, conceptual, and procedural knowledge in enacted “scripts” that are relevant to doing a task or a duty at one of the hierarchical levels from career field to pathway to specialization. There may be an observable psychomotor component, as an example choosing and dressing in Personal Protective Equipment (PPE) for specified scenarios (biological, chemical hazards, or painting tasks). A scoring guide for donning PPE might include appropriate and complete closures to avoid contamination.

There may also be underlying processes of judgment and analysis, for example, troubleshooting decision pathways or medical interpretations. Using a set of 35 evidence-based skills, similar to the Knowledge Questionnaire described above, also available free of charge from O*Net, is one way to create profiles for Cluster, Pathway, or Occupation/Specialization. Note that concepts of competence require careful discussion and planning if they are to be established as goals and outcomes of CTE preparation. Miller (1990), in a medical context, defined a “pyramid of competence” with four ascending levels. The levels range from “knows” up to “knows-how” up to “shows-how” up to “does” and could be used to develop hierarchies of formative and summative tests associated with programs of study and all aspects of industry.

Thus, technical skill is distinguished by recognizing and describing the (a) cognitive process (encoding, retrieval, decision-making), (b) type of knowledge, (c) domain of the knowledge (cluster or pathway), and (d) behavioral actions required.

Summary

The keystone of this article is the definition of technical skill with knowledge and competency components.

1. Various evidence-based frameworks, including the revised Bloom’s (Anderson, Krathwohl, et al., 2001) or Marzano’s (2001) taxonomy, are available for conceptualizing and using bodies of knowledge.
2. Perkins IV requires state and local education agencies to consider technical skills, as well as academic skills, in the 5-year plans that are currently under review. States are taking a variety of stands on how they conceptualize and define technical skills, according to the results of a CETE outreach project conducted by Dr. Mike Loyd through interviews with SEA personnel across the states.
3. Looking to the future, it is possible that advances in computer technology for learning and assessing, such as those described by Bartram and Hambleton (2006), will promote cooperation among instruction, classroom assessment, and standardized testing for the improvement of the CTE system. This appears to be a top-down approach from a national or state level. On the other hand, it may be that greater effect is obtained through a grassroots approach such as the one recommended by Reeves (2003) in *Making Standards Work*.
4. Approaches to technical skill standards vary in their emphasis on tasks or knowledge and skill. Although either task or knowledge/skill elements can form the basis of test blueprint specifications, the alignment or cross-walking of both sides of the equation (work and worker perspectives as defined by the National Skill Standards Board) will provide the greatest positive influence on CTE in its preparation of the entry-level workforce.
5. Understanding the relationships among technical skill and other cognitive constructs and motivational ones, for example, work values and interests, will assist in providing valid and actionable career information to CTE learners.

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- Reeves, D. (2003). *Making standards work*. 3rd ed. Englewood, CO: Advanced Learning Press.

Web Resource

- League for Innovation in the Community College. *Career Pathway Plans of Study*. Retrieved July 8, 2008, from <http://www.league.org/league/projects/ccti/ccluster.cfm>.

Events

Test Development Workshop

October 15-17, 2008, 8am-5pm, presented by CETE, Columbus, OH; \$1,100

Developing valid, reliable assessments (tests) of job specific knowledge and skills is critical to effective defensible practice in workforce development and human resources. For information contact Robert A. Mahlman at 614/292-9072 or mahlman.1@osu.edu. To register, contact Kathy Summerfield at 614/688-4000 or summerfield.1@osu.edu.

LearningWork Connection Workshops

Registration, 8:30am, training, 9am-3:30pm, lunch on your own. All workshops are free. Location: Ohio Department of Job and Family Services (ODJFS), 4020 E 5th Ave, Columbus, Ohio. Register online at www.learning-workconnection.org/trainingsch.asp.

Program Design, August 19

Request for Proposals and Contracting, August 26

Pre-enrollment Process, September 18 and December 8

Objective Assessments/ISS, September 25 and December 17

Shared Youth Vision, October 15

Elements of a WIA Youth Program, November 12-13

DACUM/SCID

DACUM (Developing a Curriculum) Institute, August 11-15, 2008, September 22-26, 2008, November 10-14, 2008, 8am-5pm, hosted by CETE/OSU, Columbus, OH; \$1,395

SCID (Systematic Curriculum and Instructional Development), August 18-22, 2008, September 29-October 3, 2008, November 17-21, 2008, 8am-5pm, hosted by CETE/OSU, Columbus, OH; \$1,195

For information, contact Robert Norton at 614/292-8481 or norton.1@osu.edu; Debbie Weaver at 614/292-9934 or weaver.22@osu.edu; www.dacumohiostate.com.

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