# MENTORLINKS: ADVANCING TECHNOLOGICAL EDUCATION, 2008-2010

#### EDITED BY ELLEN M. HAUSE

entorLinks, part of the Advancing Technological Education program supported by the National Science Foundation and administered by the American Association of Community Colleges (AACC), provides technical assistance and networking opportunities to improve community college programs that prepare technicians in the science, technology, engineering, and mathematics (STEM) fields. The program works with community colleges to establish connections for new ideas and relationships through networking opportunities at program meetings and national conferences, and to gain insight on building, improving, and sustaining new and existing programs. MentorLinks features professional development opportunities for community colleges, with a special emphasis on mentoring.

Through a national grant competition, AACC selected nine community colleges and nine mentors working in diverse areas of technician education to participate in a two-year grant project beginning in October 2008. MentorLinks pairs community colleges seeking help with program development with an experienced mentor in their discipline. Mentors have strong credentials and extensive experience in planning and implementing advanced technology programs. Each college receives a total of \$15,000 in direct funding for program development, and additional monies for travel support to attend national project meetings and conferences.

The nine MentorLinks projects, which represent a diverse range of technical education, are developing new or strengthening existing programs in

- biotechnology
- geospatial technology
- construction technology
- information technology
- welding technology
- energy efficiency and assessment
- renewable energy and
- laboratory science technician training.

With their mentors, these colleges work to develop curriculum, implement changes in ongoing programs to be more responsive to industry and employer needs, provide professional development programs for faculty and staff, recruit students, offer experiential learning opportunities to students, engage local industry and employers more closely with the colleges, increase recognition and program support among college administrators, and leverage additional funding. Their efforts, in just the first year of the program, have resulted in the creation of new courses, degrees, certificates, departments, industry partnerships, and workforce development programs.

#### 2008-2010 MentorLinks Colleges

Bluegrass Community and Technical College, KY
Clark State Community College, OH
Lewis and Clark Community College, IL
Lincoln Land Community College, IL
Mid-Plains Community College, NE
Neosho County Community College, KS
Pueblo Community College, CO
West Virginia University at Parkersburg, WV
Westmoreland County Community College, PA





## BLUEGRASS COMMUNITY AND TECHNICAL COLLEGE

#### **Biotech for the Bluegrass Region**

With employment projections for biotechnicians in central Kentucky expected to grow by 8% through 2016, Bluegrass Community and Technical College (BCTC) is developing a biotechnician program as a direct result of local industry need. Serving as the state's second largest two-year college, BCTC is strategically located to provide biotechnicians to support the needs of local pharmaceutical and biotech companies, and research efforts at the University of Kentucky.

The primary goals of BCTC's MentorLinks project include curriculum development, student recruitment, and industry partnerships. With input from the college's MentorLinks mentor and its local advisory committee, the college has refined curriculum, and developed partnerships with local secondary schools and area employers to establish 2+2 pathways and internship opportunities for students.

BCTC started with a certificate-level biotechnology program designed to increase students' basic skills in solution preparation, molecular biology, recombinant DNA, and chromatography. Student enrollment in biotechnology classes began in 2009; and the program anticipates awarding 10 certificates in May 2010.



#### **CONTACTS**

## Bluegrass Community and Technical College

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#### Mentor

Lisa Seidman Madison Area Technical College, WI

- Three new biotechnology courses developed and customized to meet local employer needs
- New Basic Biotechnician certificate offered in spring 2010
- Dual credit opportunities created to streamline 2+2 efforts
- Project team attendance at the Bio-Link Summer Fellows Forum
- New curriculum to be piloted through the Workforce Investment Act for Dislocated Workers in fall 2010
- ATE grant proposal submitted to assist in biotechnology program development

#### CLARK STATE COMMUNITY COLLEGE

## **Integrating High Performance Computing and Cybersecurity**

Clark State Community College is expanding the security option of its Computer Networking program into a new program in CyberSecurity and Information Assurance. Local economic development efforts have recently focused on firms engaged in research, visualization, data management, and related technologies. Wright Patterson Air Force Base, located within Clark State's service district in Springfield, Ohio, is undergoing significant expansion that also requires individuals trained in cybersecurity and cluster computing.

As part of its MentorLinks project, Clark State completed an IT workforce needs assessment and participated in a modified Design a Curriculum (DACUM) process in the areas of cybersecurity, high performance computing, and convergence technology led by their mentor. The information gathered from the DACUM and the needs assessment drove the development of the Cybersecurity and Information Assurance program, which has been submitted to the Ohio Board of Regents for final approval.

In collaboration with business partner Avetec, Clark State leveraged its MentorLinks support to receive its first Advanced Technological Education (ATE) grant from the National Science Foundation. The college will use the \$145,525 ATE grant for its Meeting 21st Century Cybersecurity Needs Through Advanced Technological Education project to support career, curriculum, and articulation pathways for students.



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#### Mentor

Ann Beheler Porterville College, CA

- Identification of key industry skills sets
- New program in CyberSecurity and Information Assurance
- Seven new courses in cybersecurity and high performance computing
- Convergence technology integrated into curriculum
- Team-based internships offered through business partnership
- Program expansion funding support through a new ATE grant

## Lewis and Clark Community College

## Expanding a Welding Curriculum to Meet Regional Needs: A Collaboration of High Schools, Industry, and a Community College

Lewis and Clark Community College's (L&C) MentorLinks project aims to expand the welding curriculum from its current limited version of a two-course certificate into a degree- and certificate-based academic program that is responsive to industry needs and builds upon partnerships with local secondary schools and businesses.

L&C benchmarked community colleges with exemplary welding programs and visited those institutions to gain information about facilities, equipment, and curriculum. L&C conducted industry needs surveys and took advantage of expertise among the college's welding advisory group to develop a new welding curriculum comprised of an AAS degree, nine certificates, and 18 new courses. The new curriculum was approved by the college's curriculum-approval bodies in late 2009, and by the Illinois Community College Board in early 2010.

Budget and personnel planning is currently under way for the implementation of the welding curriculum at L&C in August 2010. Grant funds are being sought from the National Science Foundation's ATE program and other sources. The additional funding will support an innovative welding program based on energy-efficient equipment and research on effective teaching of welding skills.



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#### Mentor

Rassoul Dastmozd Clark College, WA

- Industry needs assessment and benchmarking of exemplary welding programs
- New AAS degree and nine certificates
- Eighteen new courses
- Planning for acquisition of personnel, facility, equipment, and supplies for fall 2010 implementation of new welding curriculum
- Preparation of grant applications to support and sustain project goals

## LINCOLN LAND COMMUNITY COLLEGE

## **Developing a Geographic Information Systems** (GIS) Program

Lincoln Land Community College (LLCC) is assuming a leadership role in meeting regional workforce needs by integrating geographic information systems (GIS) into its Geoscience program. Private business firms and local government agencies are using GIS techniques to assist with decision-making and are in need of employees with a GIS background. LLCC developed an Introduction to GIS course for implementation in spring 2010. Fifteen students are currently enrolled in the class including employees from the Springfield (IL) Sanitary District and the Springfield Fire Department.

MentorLinks project activities include student recruitment, collaboration with secondary schools, industry partnerships, professional development for faculty and staff, and community GIS workshops. LLCC held two workshops in partnership with ESRI, one on System Administration and another on Building a Geodatabase. An Advanced GIS course and a GIS certificate program are expected to be offered in 2011.



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#### Mentor

Vince DiNoto

Jefferson Community and Technical College, KY

- Introduction to GIS course developed; 15 students enrolled
- Workshops offered for faculty, staff, and employees in local industry
- Advanced GIS training and professional development for project staff
- GIS lab established
- Successful marketing of new GIS course
- Outreach to local government agencies including transportation, public health, the Springfield Parks District, and the Sangamon County GIS Department



#### MID-PLAINS COMMUNITY COLLEGE

#### **Biotechnology Curriculum Development Plan**

Mid-Plains Community College (MPCC) serves a 20,000 square mile rural area in Nebraska that crosses two time zones. This area supports agricultural biotechnology and the many related careers associated with plant and animal breeding and production. MPCC is developing a biotechnology curriculum that can be included as part of an AA, AS, or AAS degree program designed to meet the needs of area business and industry.

As part of the MentorLinks project, MPCC established and convened an advisory committee, researched biotechnology curriculum, engaged in professional development activities, assessed equipment needs, conducted industry outreach, and developed two new courses, Introduction to Biotechnology I and II—which were approved by the MPCC Instructional Services Committee in 2009.

MPCC is working to enhance the operation of its advisory committee, build partnerships with industry, conduct extensive career awareness to middle and high school students, and provide career pathways. The college uses its Mobile Education Lab and distance learning technologies to increase awareness of the biotechnology field throughout its wide service area.



#### CONTACTS

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#### Mentor

Bart Gledhill Bio-Link, City College of San Francisco, CA

- Active industry advisory committee
- Twenty-one students completed BIOS 2120 Genetics course
- Curriculum developed for two new introductory biotechnology courses
- Faculty participation in Bio-Link Summer Fellows program
- Professional development site visits completed at City College of San Francisco, Bio-Link, and Genentech

#### Neosho County Community College

#### **Building Viability Programs: Construction Vocation**

To create its Construction Technology program, Neosho County Community College (NCCC) worked with its State Board of Regents to establish National Center for Construction Education and Research as the core curriculum, which matched industry needs. As part of the initial program in this rural area, eight students built a 1250 sq. ft. house from start to finish.

In consideration of the recent economic downturn and housing market sales, NCCC's MentorLinks project focus shifted to creating an AAS degree in Energy Management with a specialized certificate in Sustainable Energy Installation. NCCC worked with the Kansas State Energy Office and the Kansas Corporation Commission to create one of only three approved Energy Auditing programs in the state. The program moved from offering four classes in 2008-2009 to thirteen classes in 2009-2010, effectively doubling the number of faculty involved and students enrolled in the program.

NCCC faculty received LEED AP training and became Building Performance Institute (BPI) certified to teach energy management courses. Green building standards are being incorporated into the construction technology program; and 18 community college students are currently building an Energy Star-rated house utilizing green building techniques.

The state of Kansas recognized NCCC as a center for energy efficient technology in residential and light industrial construction technology by awarding the college Department of Commerce grants to further the initiative.



#### CONTACTS

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#### Mentor

Spencer Hinkle Portland Community College, OR

- AAS degree in Energy Management with a specialized certificate in Sustainable Energy Installation
- One of only three approved Energy Auditing programs in Kansas
- State funding received in the amount of \$136,730 for program expansion
- Nine new courses doubled program enrollment
- Construction Technology program articulation agreement with Pittsburg State University under development
- Plans for weatherization workshops for the community

#### PUEBLO COMMUNITY COLLEGE

## Colorado's Future Energy Maintenance Technology

The goals of Pueblo Community College's (PCC) Wind Turbine Technology project have been to understand and characterize the regional job market and training needs for wind turbine technicians, and to develop and initiate a wind energy degree and certificate training program. The project began with a thorough examination of emerging energy growth patterns and job markets, identification of wind turbine technical skill and certification requirements, and an analysis of implications for training curricula.

In collaboration with its mentor college, Laramie County Community College (WY) and two other colleges in Colorado, PCC developed the curriculum for the program. The curriculum was accepted into the Colorado Common Course System and approved by PCC's curriculum committee. It is currently under review by the Colorado Community College System.

During the 2009-2010 academic year, the college received \$80,000 in federal Carl Perkins Career and Technical Education funds for the acquisition of wind energy training equipment. The funds are being used to build electronics, and motors and controls trainers through PCC's "teaching factory" for use in the curriculum. The college also developed articulation agreements with Laramie County Community College and Northeastern Junior College for summer supplemental coursework for PCC students in their wind turbine training facilities. The first full cohort of wind technology students is slated for fall 2010.



#### CONTACTS

#### **Pueblo Community College**

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#### Mentor

Michael Schmidt WindIngen, CO

- Industry advisory committee established
- Wind turbine technology curriculum developed as an option in the Energy Maintenance degree program
- Beginning wind technology courses offered to Energy Maintenance students
- A full wind technology student cohort anticipated in fall 2010
- Federal Carl Perkins funds acquired to construct wind energy trainers
- Exploration with partners on the use of mobile learning labs for wind technicians on-site

## WEST VIRGINIA UNIVERSITY AT PARKERSBURG

#### **Energy Assessment and Management Technology**

WVU Parkersburg attended its initial MentorLinks meeting in Washington, D.C. in 2008 intending to develop a renewable energy program. With assistance from their mentor from Lane Community College, OR, the team identified a new direction for the project focusing on energy efficiency and management. The college received data pertinent to their geographical region, online resources from energy agencies and organizations, and proven examples from Lane Community College and its Northwestern Energy Education Institute curricula.

From these materials and resources, WVU Parkersburg took home a vision and the beginning of a viable technical program in Energy Assessment and Management Technology (EAMT). The EAMT one-year certificate and two-year AAS degree will train technicians to perform residential and commercial weatherization, conduct energy audits, develop maintenance strategies, and to serve as a facilities energy manager. The curriculum is being introduced in the spring 2010 semester. Co-op arrangements and partnerships have been formed with the local Community Resources Action Group for lowincome weatherization and with local construction and HVAC/R contractors.

Future plans include expanding the program into both photovoltaic and hot water solar systems installation. Since WVU Parkersburg is the only community and technical college in the state to offer four-year degrees, additional plans include the creation of a baccalaureate degree in energy.



#### CONTACTS

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#### Mentor

Roger Ebbage Northwest Energy Education Institute, Lane Community College, OR

- AAS degree and certificate program in Energy Assessment and Management Technology
- Partnerships with community and state energy and educational organizations
- \$470,000 in state funding leveraged to expand program and to develop a solar energy technology certificate and AAS degree
- Primary energy education center for the state of West Virginia
- Planning underway to develop a four-year energy degree that incorporates entrepreneurship and facility management

## WESTMORELAND COUNTY COMMUNITY COLLEGE

## **Meeting Our Region's Need for Trained Laboratory Technicians**

Westmoreland County Community College (WCCC) is developing an AAS degree program to prepare students for positions as science laboratory technicians. This program will meet the needs of area businesses and provide a career path for WCCC students interested in math and science. The program will have five main tracks: biology, chemistry, medical applications, nanotechnology, and forensics. After graduation, a student may seek employment or enroll in a university with an articulation agreement to earn a baccalaureate degree.

Based upon input from the advisory board, program requirements for the biology, chemistry, medical applications, and forensics tracks have been developed. The nanotechnology track merged with an existing bionanotechnology program at Penn State University, which resulted in a 60% increase in student enrollment.

To meet the goal to offer the Science Laboratory Technician program by fall 2010, seven new courses are being developed. These include: Chemical and Laboratory Safety, Careers in Laboratory Technology, Molecular Genetics, Biochemistry, Instrumental Analysis, Analytical Chemistry, and an internship. WCCC will market the program to area high schools and is developing additional partnerships to increase the depth of the advisory board.



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#### Mentor

David Brown Southwestern College, CA

#### **Project Highlights**

- Program requirements established for four tracks based upon advisory board recommendations
- Seven new courses in development as a result of a gap analysis
- Nanotechnology track merged with bio-nanotechnology program resulting in a 60% increase in enrollment
- Presentations to local high school science teachers about nanotechnology laboratory technician career opportunities
- Collaboration with Penn State University to help recruit students into the nanotechnology program

#### AACC MENTORLINKS MENTOR TEAM

#### **Ann Beheler**

Vice President, Academic Services Porterville College 100 East College Avenue Porterville, CA 93257 559-793-6436 abeheler@gmail.com Ann Beheler currently serves as the vice president of academic affairs at Porterville College. Prior to that, she spent several years in the corporate world, was a full-time faculty member at Richland College, and held the positions of dean/executive director of Engineering and Emerging Technologies at Collin College and dean of Business, Computing, and Career Services at Orange Coast College. Beheler has experience garnering and leading grants, including a Regional National Science Foundation Convergence Technology Center. She holds a PhD in education, a MS in computer science, and a BS in mathematics.

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Deputy Director, Bio-Link City College of San Francisco 21 Saratoga Court Alamo, CA 94507 925-837-6156 bgledhill@biolink.ucsf.edu **David R. Brown** is a professor of chemistry at Southwestern College (SWC). He directs the SWC Pharmaceutical and Laboratory Science program, which was established with a grant from the NSF ATE program for which he was the PI. Brown is a leader in the national initiative to increase the participation of two-year college students in undergraduate research, mentoring nearly 30 undergraduate researchers since 1998. He holds a BA in chemistry from Southern Illinois University, Edwardsville and a PhD in physical chemistry from the University of Illinois at Urbana-Champaign.

Rassoul Dastmozd began his personal journey in community colleges as a student. For the past 24 years, he has been associated with three community college districts as a faculty member, a department chair, an academic dean, and a vice president. At Clark College, Dastmozd currently serves as vice president of instruction and workforce development. Dastmozd brings experience from the manufacturing sector and has provided industrial training to Cargill, John Deere Works, and Roquette. He holds a BS in engineering technology, a MA in education administration, and a PhD in education and human resources.

Vincent A. DiNoto, Jr. is dean of College and Systemic Initiatives and a professor of physics and astronomy at Jefferson Community and Technical College. He is co-PI of the National Center for Geospatial Technologies and co-PI of the National Center for Information and Communications Technologies. He has been an invited speaker and published papers with the American Association of Community Colleges, League for Innovation, Astronomical Society of the Pacific, and American Association of Physics Teachers. He has been awarded more than 20 competive grants as either the PI, director, or co-PI.

Roger Ebbage is the Energy Management program coordinator at Lane Community College, where he founded and currently serves as the director of the Northwest Energy Education Institute. Ebbage is an Association of Energy Engineers certified energy manager, a California certified energy auditor, and a Bonneville Power Administration certified energy auditor/inspector. He was recently selected as the "Energy Manager of the Year" by the National Association of Professional Energy Managers and "Innovator of the Year" by the League for Innovation. He holds an MA in environmental studies with an emphasis in passive solar design.

Bart Gledhill is the co-PI and deputy director of Bio-Link, the National Advanced Technology Center in Biotechnology. Previously, he served as a fellow for the American Association for the Advancement of Science, scientist and deputy associate director of biomedical sciences and biotechnology for the Lawrence Livermore National Laboratory, and an associate professor of clinical medicine for the University of Pennsylvania. Gledhill has published in nearly 200 scientific periodicals and holds three patents and one copyright. He received his Doctor of Veterinary Medicine from the University of Pennsylvania and his PhD from the Nobel Medical Institute in Sweden.

#### **Spencer Hinkle**

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Spencer Hinkle is the co-chair of the Building Construction Technology Department at Portland Community College. He currently serves as the PI on an NSF ATE grant, "Sustainability Training for Technical Educations," designed to develop green curriculum in PCC's Building Construction Technology program. Hinkle received the NISOD Faculty Excellence Award and the Association of Community College Trustees Regional Faculty Award. He holds a BA in geography and an AAS in building construction technology. He is a member of the Architectural Woodworking Institute, the Oregon Remodelers Association, and the National Kitchen and Bath Association.

Michael Schmidt has been involved in teaching the subject of wind energy to college students and the public since 2005. He served as a program coordinator and instructor at Iowa Lakes Community College where he helped to develop the first Wind Energy and Turbine Technology program. Previously, he instructed and coordinated the Maintenance Electrician program at Iowa Central Community College, and directed Laramie County Community College's new Wind Energy Technology program. He recently left teaching to take a position with WindIngen, a third party service provider and a division of MD&A, as field services and training manager.

Lisa Seidman has been an instructor in the Biotechnology Laboratory Technician program at Madison Area Technical College since 1987. She is the co-PI for Bio-Link, a national consortium of biotechnology educational programs that is headed by the City College of San Francisco. She is the author of three textbooks for biotechnology students: Basic Laboratory Methods for Biotechnology: Textbook and Laboratory Reference and Basic Laboratory Calculations for Biotechnology, and is currently working on a companion lab manual in Basic Biotechnology Laboratory Techniques to be published spring, 2011.

#### SELECTED WEB RESOURCES

- **Advanced Technological Education Centers** www.atecenters.org
- Advanced Technological Education Projects www.ateprojectimpact.org
- ATE Central http://atecentral.net
- **ATETV** http://atetv.org
- **Teaching Technicians** www.technicians.org
- **National Science Foundation** www.nsf.gov/ate

#### For more information on AACC's MENTORLINKS project, contact:

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