ADVANCING STEM EDUCATION

Mary Hopkins-Best, Interim Provost and Vice Chancellor
STEM educational reform necessary for a successful and competitive workforce

National:
- STEM Teacher Corps
- STEM Education Coalition

Wisconsin:
- Wisconsin Technology Council: Educating a Tech-Savvy Workforce for Wisconsin
- Wisconsin Common Core Standards for Mathematics

“STEM education is an imperative to secure our state’s viability in a competitive global economy.”

S. Mark Tyler, President, OEM Fabricators

*Wisconsin STEM: Navigators to the Future, a report supported through the Wisconsin Technology Council, 2012*
STEM education focus:

- Integrated studies
- Applied opportunities
- Relationship to career and personal aspirations
- Emphasis on problem solving, collaboration, creativity and critical thinking

UW-Stout polytechnic focus:

- Offer a comprehensive curriculum with a career focus
- Blend theory with practice — applied learning
- Apply student and faculty research to develop innovative solutions to real world problems
- Collaborate with business, industry and other education institutions to grow the economy
UW-Stout STEM focus:

- STEM Outreach and Collaboration
- STEM Education Innovation
- STEM Applied Research and Economic Development
Western Wisconsin STEM Consortia

Partners
- UW-Stout
- Western Wisconsin Technical College
- Nine school districts
- Business and education

Goals
- Professional development
- Increase student academic achievement
- Develop STEM integrated curriculum project
- Build collaborative relationships among K-12, higher education and business
Western Wisconsin STEM Consortia

Project Components

- Two-week summer STEM Academy
- Seminars throughout the year
- Online communication and collaboration
- Business partner Involvement
- Teacher peer coaching
- School teams

Professional Development for Teachers

- STEM content
- STEM teaching strategies
- STEM integrated curriculum
Western Wisconsin STEM Consortia

Evaluation

Learning improved significantly in the four categories measured

- Data Analysis and Probability ↑ 7.48
- Geometry and Measurement ↑ 9.45
- Interdependence, Populations and Ecosystems ↑ 2.17
- Force, Motion and Simple Machines ↑ 4.98

Positive participant feedback

- “Every teacher should have this opportunity.”
- “The UW-Stout instructors are fabulous.”
- “STEM: Stimulating To Educator’s Minds.”
STEM EDUCATION INNOVATION

Applied Science Scholar

Project Goals
- Recruit/retain traditionally underrepresented students
- Enhance student learning
- Integrate diversity into the curriculum
- Develop a model for replication

Living/Learning Community
- Live together
- Learn together
- Serve together
- Faculty and peer mentors
Outcomes

Entire Applied Science Freshmen Community:
- Living/Learning Community was effective
- Improved understanding of the program
- Increased awareness of diversity issues

Highlights:
- 37 students received $250,000 in NSF scholarships
- 40% of scholarship recipients completed internships
- 100% of scholars have peer and faculty mentors
- 100% of scholars had paid research experiences
- 9% increase in underrepresented students in first year
- 85% retention rate
Applied Science Scholar

Applied Research and Industry Experiences

Sarah Voeller
Recherched fungal structures using Scanning Electron Microscopy

Kelvin Smith
Recherched hydrophobic dyes used in medical applications

Lucas Lee
Interned with Expert Tree Service and Science

Henry Hansen
Interned with River National Fish Hatchery for the U.S. Fish and Wildlife Service
Value Added Food Products

UW-Stout Discovery Center
Harnesses the expertise of UW-Stout faculty, staff, students and other specialists to foster discovery and innovation.

Technical assistance and applied research for Wisconsin small and medium-sized agricultural operations.

Funded by Wisconsin Department of Agriculture, Trade and Consumer Protection, matched with private sector enterprises.

Project Goals
- Increase commercialization of Wisconsin-grown organic and natural value-added food products
- Streamline value-added food development and innovation process
- Improve private sector partners’ ability to develop and commercialize new value-added food products.
Value Added Food Products

Project Component: Applied Research

Collaborative research and development by UW-Stout faculty and graduate students.

Products refined and commercialized in area of food science
- Chicken Pot Pie
- Cheese product w/natural omega

Products under development
- Basil processing
- Natural pie crusts
- Fruit spritzers
- Beet-based product line
- Flavored beverages
- New food ingredient

Projects being scoped
- Nutritional replacement
- Baby food
- Cranberry seed oil
Project Component: Technical Assistance

Tailored workshops focused on innovation processes and targeted agricultural producers and producer groups (62 growers).

Workshop topics included:
- Supplier clearances
- Safety and licensing requirements
- Product development
- Scaling to commercial production
- Labeling, packaging and pricing
- Distribution and marketing

Project Progress and Sustainability

- Piloting three projects taking a food product from refinement to commercialization, including market research (domestic and international distribution).
- An Economic Development Administration award underwrites a share of qualified costs for those projects advancing to commercialization in rural or distressed Wisconsin communities.
UW-Stout STEM focus:

STEM OUTREACH AND COLLABORATION

STEM EDUCATION INNOVATION

STEM APPLIED RESEARCH AND ECONOMIC DEVELOPMENT

Questions? Comments?