A Summary: ASQ Advancing the STEM Agenda Conferences
Uniquely Networking on Improving K-16 STEM Education
And the STEM Pipeline Through Integration of Quality Ideas

Annual Conferences Were Sponsored by the ASQ Education Division with
2011 & 2012 Co-Sponsor: University of Wisconsin-Stout
2013 Co-Sponsor: Seymour and Esther Padnos College of
Engineering and Computing, Grand Valley State University

Conference Summaries with Links to Keynotes’ Presentation Slides and
Breakout Sessions’ Peer-Reviewed Papers

Prepared by Cindy P. Veenstra, Ph.D.
Conference Co-Chair, 2011-2013
January 24, 2014
Conference Proceedings

Conference Program and Poster/ Breakout Sessions

Links provided to presentations and peer-reviewed papers

with additional references related to the 2011 conference
Tuesday July 19, 2011
Pre-Conference Workshops and Reception

12:00 Noon
Registration and Check-In Open (until 5:00 p.m.),
Room 142 Jarvis Hall Science Wing Addition

1:00 p.m. - 3:30 p.m.
Pre-Conference Workshops

K-12 Outreach in STEM Programs
Presentation Slides
With Paul Plotkowski, Grand Valley State University

Using Social Media to Support Interaction and Quality of Student Experience
With Kevin W. Tharp, University of Wisconsin-Stout

Developmental Math Education Strategies
With Deborah Kruschwitz-List, University of Wisconsin-Stout
Visit U-W Stout’s website for related information

STEM from a Job Churning Perspective
Presentation Slides
With Fernando F. Padró, Cambridge College
Tuesday July 19 4:00 p.m.- 5:00 p.m.

Conference Welcome and Reception
Julie Furst–Bowe, Provost, University of Wisconsin-Stout
Cindy Veenstra, Chair, ASQ Education Division Chair

Wednesday, July 20
Conference Sessions

7:00 a.m.
Registration and Check-In open

8:00 a.m. – 9:00 a.m.
Continental breakfast
Exhibits open
Poster Session (Poster titles included in this document)

Conference Opening Session
Welcome by Chancellor Charles W. Sorensen, UW–Stout;
Provost Julie Furst-Bowe, UW–Stout;
Cindy Veenstra, ASQ Education Division

9:00 a.m. – 9:45 a.m.
Opening Keynote--QLS: Quality as a Second Language
View the Keynote Slides
Michele Brinn, VP of Workforce Development and Education,
Greenville (SC) Chamber of Commerce

9:55 a.m. – 10:50 a.m.
Break–out Session 1

11:00 a.m. – 11:55 a.m.
Break–out Session 2

Luncheon and Keynote
Provost Julie Furst–Bowe, UW-Stout
Fernando F. Padro, ASQ Education Division

Keynote Address: STEM: An Entrepreneurial Approach
View the Keynote Slides
Keith T. Miller, President, Virginia State University, a HBCU university

1:20 p.m. – 2:15 p.m.
Break–out Session 3

2:25 p.m. – 3:20 p.m.
Break–out Session 4

3:30 p.m. – 4:30 p.m.
Conference Closing Session
Closing Keynote: Lessons Learned and Next Steps
Sharing what we have learned, systems thinking on STEM using Baldrige and next steps for working on STEM success at your educational institutions and in industry
View the Keynote Slides
Julie Furst-Bowe, Provost and Vice Chancellor for Academic and Student Affairs, University of Wisconsin-Stout

4:30 p.m. – 5:00 p.m.
Closing Reception
School and Classroom Data from the Michele Brinn’s Keynote: Quality IS a Second Language!

The Education Division’s book is based on this conference, a team effort of 36 authors, what fun we had creating it and explaining the lessons learned on STEM Education from the conference. (Published by ASQ Quality Press)

“Veenstra, Padró, and Furst-Bowe provide a huge contribution to the field of STEM education. We all know the statistics and of the huge need in the area of STEM students and education, but what has been missing are application and success stories backed by research and modeling. The editors have successfully contributed to our need by focusing on collaborative models, building the K-12 pipeline, showing what works at the collegiate level, connecting across gender issues, and illustrating workforce and innovative ideas.”

--John J. Jasinski, Ph.D., President, Northwest Missouri State University

References Relates to the 2011 Advancing the STEM Agenda Conference

Full Conference Program is online: Conference Program
Read about the conference in the QEDNews Fall 2011, pages. 4 and 11; also 2011 WCQI workshop on STEM Education, “STEM Education: Changing the Direction” (p. 20)Read an in-depth article about President Miller’s views on STEM Education, in Quality Approaches in Higher Education, December 2011, p. 5
## Poster Session

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
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<tr>
<td>Apply Failure Modes and Effects Analysis (FMEA) in STEM Curriculum Redesign</td>
<td>Xuedong (David) Ding, University of Wisconsin-Stout</td>
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<td>Career Services at UW-Stout - A Collaborative and Integrative Approach</td>
<td>Amy Lane, University of Wisconsin-Stout</td>
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<tr>
<td>Emerging Virtual Modeling Technology to Enhance STEM Students Critical Thinking</td>
<td>Xuedong (David) Ding, University of Wisconsin-Stout</td>
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<tr>
<td>JETS TEAMS Competitions Builds Future Leaders in STEM Fields</td>
<td>David Batts and Charles Lesko, East Carolina University</td>
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<td>Science Career Motivation and Influences</td>
<td>Victoria J. Fawcett-Adams, Shenandoah University</td>
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<td>Using Regional Data Collection to Inform University Led Initiatives: The Case of a STEM Education SWOT Analysis</td>
<td>Jerlando F. L. Jackson and LaVar J. Charleston, Wisconsin’s Equity and Inclusion Laboratory, University of Wisconsin Madison</td>
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[Paper](#)
### Conference

**Proceedings**

**Breakout Sessions**

**2011 ASQ Advancing the STEM Agenda in Education, the Workplace and Society Conference**  
**July 19-20, 2011 • University of Wisconsin-Stout**

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<tr>
<th>Track 1: Providing Quality and Excellence in K-12 STEM Education</th>
<th>Track 2: Higher Education STEM: Innovative Approaches</th>
<th>Track 3: STEM Partnerships in K-12, the University, the Workplace and Society</th>
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<tbody>
<tr>
<td><strong>Break-out Session 1:</strong> 9:55 a.m. to 10:50 a.m.</td>
<td><strong>Session 2-1:</strong> Interdisciplinary Approaches Improve STEM Instruction Design</td>
<td><strong>Session 3-1:</strong> Innovative Models for STEM Partnerships in the 21st Century</td>
</tr>
</tbody>
</table>
| **Session 1-1:** Teacher Education and Collaboration Improves K-12 Math and Science Learning | **Developmental Math Design for a Science/Math Bridge Program: An Accelerated Approach to Basic Skill Remediation**  
Luanne Borowicz and Emily Baguhn  
Madison Area Technical College | **Toward a New Paradigm: A Bachelor of Science Degree with a Major in Engineering Education**  
Kenneth Reid and Eric T. Baumgartner  
Ohio Northern University |
| **SySTEMically Improving Student Academic Achievement in Mathematics and Science**  
Kevin Mason, Charles Bomar and Petre Ghenciu, University of Wisconsin-Stout; Mike LeDocq and Carolyn Chapel, Western Technical College; Jerrilyn Brewer, Sparta Area School District; and Jerry Redman, Redman & Associates | **Interdisciplinary Lesson Study: Building Graph Interpretation, Web Evaluation Skills and Enthusiasm**  
Maleka Hashmi, Amanda Little and Jennifer Grant  
University of Wisconsin-Stout | **Partnering for Success in the 21st Century**  
Maureen M. McMahon and Terri T. Showers  
Anne Arundel County Public Schools |
| **Mathematics Placement and Student Success: The Transition from High School to College Mathematics**  
David Boyles, Chris Frayer, Leonida Ljumanovic and James Swenson  
University of Wisconsin-Platteville | **Paper**  
**Presentation** | **Presentation** |
| **Paper**  
**Presentation** | **Presentation** | **Presentation** |
**Track 1: Providing Quality and Excellence in K-12 STEM Education**

**Session 1-2: Experiential STEM Project Learning in Middle and High Schools**

- **High Performance Math**
  - Wendy Zinn
  - San Bernardino Community College District
  - Craig Reisgen
  - HiPerMath
  - Paper

- **FLVS Computer Science is STEMulating**
  - Bill Jordan and Amie Ross
  - Florida Virtual School
  - Paper

**Track 2: Higher Education STEM: Innovative Approaches**

**Session 2-2: Supporting a Diverse Student Body through STEM Learning Communities**

- **A Holistic Model for Supporting a Diverse Student Body in the STEM Fields**
  - Kitrina Carlson and Krista C. James
  - University of Wisconsin-Stout
  - Paper

- **Mathematics in the Life Sciences: Developing a Best Practice**
  - Jennifer Fellabaum, Jeni Hart and Rainer Glaser
  - University of Missouri
  - Paper

**Track 3: STEM Partnerships in K-12, the University, the Workplace and Society**

**Session 3-2: Connecting STEM Students with the Workforce Leads to Careers**

- **Entry of Undergraduate Engineering Students into Work-Related Organizations and Occupational Roles Through a Co-op Program**
  - Chris Plouff
  - Grand Valley State University
  - Paper

- **A Biomanufacturing Enterprise for Innovative Student Training in Quality Systems & Regulatory Compliance**
  - Vivian Ngan-Winward, Salt Lake Community College
  - Paper
## Breakout Sessions

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<tr>
<td><strong>Session 1-3: Understanding the Gender Gap in STEM</strong>&lt;br&gt;Gender Stereotypes Persist in Middle School Students Engaged in Technical Activity&lt;br&gt;Sue Caley Opsal, Dorene Perez, Jim Gibson and Rose Marie Lynch&lt;br&gt;Illinois Valley Community College</td>
<td><strong>Session 2-3: Using Assessments in the College Classroom and to Evaluate STEM Intervention Programs</strong>&lt;br&gt;Gender Differences in Student Responses to Physics Conceptual Questions Based on Question Content&lt;br&gt;Laura McCullough&lt;br&gt;University of Wisconsin-Stout</td>
<td><strong>Session 3-3: K-12 Outreach Programs Change the STEM Conversation and Improve the Pipeline</strong>&lt;br&gt;LASER: Leadership and Science Ensures Results- A STEM Partnership between Industry and Education&lt;br&gt;Jill Brooks, Sundown Aronsson, Elyse Hogan and Jodi Roepsch, Raytheon Corporation; Chauncey Cook, McKinney Independent School District</td>
</tr>
<tr>
<td><strong>Paper</strong>&lt;br&gt;Making the Blind to See: Balancing STEM Identity with Gender Identity&lt;br&gt;Jennifer A. Skaggs&lt;br&gt;University of Kentucky</td>
<td><strong>Presentation</strong>&lt;br&gt;Establishing Legitimacy among STEM Intervention Programs: The Need for Evaluation&lt;br&gt;Casey E. George-Jackson and Blanca Rincon&lt;br&gt;University of Illinois at Urbana-Champaign</td>
<td><strong>Presentation</strong>&lt;br&gt;Making STEM Connections to Ignite Student Interests&lt;br&gt;Julie Hellweg and Christopher P. Cirmo&lt;br&gt;University of Wisconsin-Stevens Point</td>
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<td><strong>Break-out Session 4: 2:25 p.m. to 3:20 p.m.</strong></td>
<td><strong>Session 2-4:</strong> Instructional Innovation in Higher Education Improve Quality of Education</td>
<td><strong>Session 3-4:</strong> Improving Engineering Retention: Student Beliefs and Academic Preparation</td>
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<td><strong>Session 1-4:</strong> innovative Studies in K-12 STEM Learning</td>
<td><strong>Session 2-4:</strong> Inspiring Non-Science Students in STEM Courses: The Illustrated Novel Project</td>
<td><strong>Session 3-4:</strong> Differences in Engineering Students’ Beliefs About Knowledge Across Educational Levels</td>
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<td><strong>Identifying a Solar Cell Misconception Held by Middle School Students</strong></td>
<td>Maleka Hashmi and Jennifer Grant University of Wisconsin-Stout Deanna Sullmann Menomonie High School</td>
<td>Bethany A. King and Susan Magun-Jackson University of Memphis</td>
</tr>
<tr>
<td>Marsha Ing, Peter Huang, Nohemi LaCombe, Yahaira Martinez and Elaine D. Haberer University of California, Riverside</td>
<td><strong>Paper</strong> Presentation</td>
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<td><strong>Fab Labs: Re-envisioning Innovation and “Entrepreneering”</strong></td>
<td><strong>Instructional Assessment Methods to Enhance Conceptual Knowledge: A Preliminary Investigation</strong></td>
<td><strong>An Analysis of the Effect of Cognitive Factors on Students’ Attritions in Engineering: A Literature Review</strong></td>
</tr>
<tr>
<td>Sylvia Tiala University of Wisconsin-Stout</td>
<td>Derek Wissmiller University of Wisconsin-Stout</td>
<td>Xiushan Jiang and Stacey Freeman University of Kansas</td>
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<td><strong>Paper</strong> Presentation</td>
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Conference Proceedings

Conference Program and Breakout Sessions

Links provided to presentations and peer-reviewed papers with additional references related to the 2012 conference
Monday, July 16, 2012

Workshops, Conference Welcome and Reception

12:00 Noon – 5:00 p.m.
Registration and Check-In Open
Room 142 Jarvis Hall Science Wing Addition
Exhibits open all afternoon

1:00 p.m. – 3:00 p.m.
Workshops

Improving on Student-Community Learning
With Kitrina Carlson, Maleka (Polly) Hashmi, Anan M. Q. VandeLinde, Amanda Little, and John Kirk, University of Wisconsin-Stout

Helping STEM Students with Disabilities Persist
Presentation Slides, (1.39 MB)
With Kathleen Deery, Michael Lawler, Laura McCullough, and Jill Klefstad, University of Wisconsin-Stout; and Gracia Larson, Minnesota State Services for the Blind

Writing a Journal Paper
With Fernando F. Padró

Leveraging Industry Partnerships to Advance Undergraduate Applied Research
With Randall Hulke, University of Wisconsin-Stout
A highlight of this conference was a tour of the STEPS program and helping UW-Stout celebrate its STEPS program’s 16th year by watching the joy of the STEPS teams (middle school girls) in racing their radio-controlled boats that they manufactured and assembled.

3:15 p.m. – 4:15 p.m.

Conference Welcome and Opening Keynote

Conference Welcome

Dr. Julie Furst-Bowe, Chancellor, Southern Illinois University Edwardsville, and former provost, University of Wisconsin–Stout and

Dr. Cindy Veenstra, Chair, ASQ Education Division
Opening Keynote: STEM Education Classrooms: Promising Practices for Improved Learning

Presentation Slides (522 KB) (Includes a presentation on active learning)

Dr. Jeffrey E. Froyd, TEES Research Professor, Engineering Student Services and Academic Programs, Texas A&M University

4:15 p.m. – 5:00 p.m.
Welcome Reception
Book Signing for Advancing the STEM Agenda: Quality Improvement Supports STEM
5:30 p.m. – 7:00 p.m.
STEM-ing for the Future: Informal Networking (with pizza!)

Tuesday, July 17, 2012

Conference Keynotes and Breakout Sessions

7:00 a.m.
Registration and Check-In open; Room 142 Jarvis Hall Science Wing Addition
Exhibits Open all day
8:00 a.m. – 8:45 a.m.
Light Continental breakfast

8:45 a.m. – 9:50 a.m.
Opening Session
Welcome by Chancellor Charles W. Sorensen, UW–Stout

Morning Keynote: Panel Discussion on STEM Education-Industry Partnerships

Panel Leader: Dr. Paul D. Plotkowski, Dean, Padnos College of Engineering and Computing at Grand Valley State University
Panelists Include:
Mr. Jeff Asproth, Supply Chain Manager, 3M Corporation
Dr. Amy Lane, Director, Career Services, UW-Stout
Mr. Reginald McGregor, Manager, Engineering Employee Development, Rolls-Royce Corporation
Dr. Fernando Padró, Interim Director, Educational Leadership, Cambridge College

10:10 a.m. – 11:00 a.m.
Break-out Session 1

11:10 a.m. – 12:00 p.m.
Break-out Session 2

12:15 p.m. – 1:20 p.m.
Luncheon and Networking
Luncheon Keynote Address: Baldrige, STEM Engagement and Learning Communities

Presentation Slides
Dr. Julie Furst-Bowe, Chancellor, Southern Illinois University Edwardsville and former provost, University of Wisconsin–Stout
Dr. Kitrina Carlson, Associate Professor of Biology, UW-Stout; and
Ms. Krista James, Senior Lecturer of Biology, UW-Stout
1:35 p.m. – 2:25 p.m.
Break-out Session 3

2:40 p.m. – 3:30 p.m.
Break-out Session 4

3:45 p.m. – 4:30 p.m.
Afternoon Keynote: Looking to the Future: The STEM Talent Development Roadmap
Dr. Bryan D. Albrecht, President, Gateway Technical College

4:30 p.m. – 5:00 p.m.
Closing Reception and Networking

“Baldrige, AQIP and UW-Stout share similar values and quality criteria” – Dr. Julie Furst-Bowe, Luncheon Keynote

Additional References Related to the 2012 Advancing the STEM Agenda Conference

Full Conference Program is online: Conference Program

Media News Article published by UW-Stout (July, 2012): “Industry-Education Partnerships Touted at the STEM Conference”

ASQ Education Division QEDNews, Fall 2012 issue, article (p. 8): “ASQ Advancing the STEM Agenda Conference a Success!”


ASQ Education Brief, Feb. 2010, “Taking STEPS to Promote STEM Careers”


### Breakout Sessions

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| **Student Technology Access in an Urban STEM High School: The Missing Variable**  
Brian L. Sersion, Cincinnati Public Schools and Douglas M. Stevens, University of Cincinnati and Cincinnati Public Schools  
**Paper**  
**Presentation** | **Identification of Strategies that Overcome Barriers to Women and Minorities in STEM**  
A. A. Ilumoka, University of Hartford  
**Paper** | **Interdisciplinary Service Learning: Two Approaches to Solving One Problem**  
Maleka P. Hashmi and Kitrina M. Carlson, University of Wisconsin-Stout  
**Paper** | **Industrial and STEM Partnership Creates Engineering Student Leaders**  
Bruce DeRuntz et al.. Southern Illinois University-Carbondale  
**Paper** |

**High Performance Math: College Ready and Transition to College**  
Wendy Zinn, San Bernardino Community College District and Craig Reisgen, High Performance Math  
**Paper** | **A Comparison of Epistemological Beliefs of African American Engineering Students**  
Bethany King Wilkes, Oklahoma State University  
**Paper** | **Lyman Briggs College: An Innovative Living-Learning Community for STEM Education**  
Ryan D. Sweeder and Aaron M. McCrnight, Michigan State University  
**Paper**  
**Presentation** | **Seeing the Forest for the Trees – An Industry & Academic Partnership**  
Michael R. Bowman and Glendali Rodriguez, University of Wisconsin-Stout  
**Paper** |
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<td><strong>Inspiring and Engaging the Next Generation in STEM Through PLTW and REAL</strong>&lt;br&gt;Cordelia Ontiveros and Elena Alvarez, California State Polytechnic University, Pomona-College of Engineering&lt;br&gt;<a href="#">Paper</a> <a href="#">Presentation</a></td>
<td><strong>Applied Universal Design for Learning in STEM Education</strong>&lt;br&gt;Kevin W. Tharp, Renee Howarton, Dean Wirtanen, Glendali Rodriguez and Xuedong (David) Ding, University of Wisconsin-Stout&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>Organizational Learning in STEM Education Contexts: Analyzing the “Stickiness” of High Impact Practices</strong>&lt;br&gt;Jo Ann Oravec et al. University of Wisconsin at Whitewater&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>Building STEM Partnership Teams in Suburban Districts</strong>&lt;br&gt;Christopher Reis, School District of Kettle Moraine (WI)&lt;br&gt;[Paper] <a href="#">Presentation</a></td>
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<tr>
<td><strong>Using Hands-on Robotics Projects to Engage and Strengthen High School Students Participation in STEM Education</strong>&lt;br&gt;Andy S. Zhang et al., New York City College of Technology of CUNY&lt;br&gt;[Paper] <a href="#">Presentation</a></td>
<td><strong>Creating a Pipeline: An Analysis of Pre-College Factors of Students in STEM</strong>&lt;br&gt;Erica Harwell and Derek A. Houston, University of Illinois at Urbana-Champaign&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>Improving Mathematics Success Through Enhanced Support Services</strong>&lt;br&gt;Alexander Basyrov, Christopher P. Bendel, Seth Dutter and Benjamin F. Jones, University of Wisconsin-Stout&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>Collaborative Educational Experiences through Higher Education-Industry Partnerships</strong>&lt;br&gt;Thomas E. Pinelli, Langley Research Center (NASA) and Cathy Hall, East Carolina U.&lt;br&gt;<a href="#">Paper</a></td>
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## Breakout Session 3

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<tr>
<td><strong>Leveraging Simple Problems to Introduce Engineering Principles and Ways of Thinking</strong>&lt;br&gt;Kenneth Welty and David Stricker, University of Wisconsin-Stout <a href="#">Paper</a></td>
<td></td>
<td><strong>A Philosopher Looks at STEM Quality in Higher Education from a Liberal Arts and Sciences Perspective</strong>&lt;br&gt;Jeremy A. Gallegos, Friends University <a href="#">Paper</a></td>
<td><strong>STUDENTfacturED : Providing a Way to “STEM” Out from Behind Old School Walls and Into the Real World Workplace</strong>&lt;br&gt;Vivian Ngan-Winward, Salt Lake Community College <a href="#">Paper</a></td>
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**Break-out Session 3: 1:35 p.m. to 2:25 p.m.**
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<td>The 4-H Tech Wizards Program: Engaging Underserved Youth in STEM Joanna M. Skluzacek et al., University of Wisconsin-Extension.</td>
<td>Diversity Awareness Education in an Introductory Seminar Course to Promote Social Responsibility Krista C. James and Kitrina Carlson, University of Wisconsin-Stout</td>
<td>Preparing Students for STEM Research at the Lyman Briggs College Ryan D. Sweeder and Philip E. Strong, Michigan State University</td>
<td>Gesture-Based Software Development with Undergraduate Teams Trudi Miller et al. University of Wisconsin-Stevens Point</td>
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<tr>
<td>Dual Enrollment: A STEM/Engineering Initiative Tecca Larrick, Kent State University-Tuscarawas</td>
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Break-out Session 4: 2:40 p.m. to 3:30 p.m.
Conference Proceedings

Conference Program and Breakout Sessions

Links provided to presentations and peer-reviewed papers with additional references related to the 2013 conference
3rd Annual ASQ Advancing the STEM Agenda Conference
“Collaboration with Industry on STEM Education”
June 3-4, 2013 • Grand Rapids, Michigan
On the Grand Valley State University Pew Campus
Sponsored by the ASQ Education Division and
Grand Valley State University’ Seymour and Esther Padnos College of Engineering and Computing

Program: Collaboration with Industry on STEM Education

Monday, June 3, 2013
Conference Workshops, Conference Welcome and Reception

12:00 Noon – 5:00 p.m.
Registration and Check-In Open
Exhibits open all afternoon

1:00 p.m. – 3:00 p.m.
Workshops
Improving Graduation Rates at a Comprehensive University: A Case Study of Institutional Alignment and Process Improvement in Higher Education

Presentation Slides (1.9MB)

With Dr. Paul Plotkowski, Dr. Nancy Giardina, Dr. Shaily Menon, Grand Valley State University

How to Make Your Entrepreneur Dreams a Reality
With Dr. Thomas Zurbuchen, University of Michigan; Mr. Kevin McCurren, GVSU; Mr. Richard Sheridan, Menlo Innovations

Developing Highly Effective Industry Partnerships: Co-op to Capstone Courses
Presentation Slides (PDF, 1.6 MB)
With Dr. Chris Plouff, Grand Valley State University

Implementing and Assessing STEM Learning Communities
Dr. Ryan Sweeder, Michigan State University; and Dr. Laurie Witucki, Grand Valley State University
Conference Welcome Keynote and Reception: Be a STEM-er

3:15 p.m. – 5:00 p.m.
Welcome by Dr. Gayle Davis, Provost, Grand Valley State University

Welcome Keynote: A Journey in Continuous Improvement: Preparing the Next Generation of STEM Professionals

Mr. Reginald McGregor, Manager, Engineering Employee Development R&T Strategy and Manager, K-12 STEM initiatives, Co-op Program and Early Career Development in Engineering Programs, Rolls-Royce Corporation

Testimonial from a conference participant:
“The conference really pulled in some power players in industry who have genuine interest in education, especially STEM education. I was impressed!”

Welcome Reception:
Dr. Paul D. Plotkowski, Dean, Seymour and Esther Padnos College of Engineering and Computing, GVSU
Dr. Charlie Standridge, Conference co-chair and Assistant Dean, Seymour and Esther Padnos College of Engineering and Computing, GVSU
Dr. Cindy Veenstra, Conference co-chair, ASQ Education Division

Grand Valley State University photos from the conference website. The blue bridge over the Grand River was symbolic to the Conference as the Continuous Improvement (CI) Path we “walk the talk” to improve STEM Education through our visions for STEM Education; the PDSA cycle; industry-education collaboration; research; and best practices for STEM student retention.
Tuesday, June 4, 2013
Conference Keynotes and Breakout Sessions

7:00 a.m.
Registration and Check-In open; DeVos Center

8:00 a.m. – 8:45 a.m.
Light Continental breakfast

8:45 a.m. – 9:40 a.m.
Conference Opening Session
Morning Keynote: Panel Discussion — Industry Initiatives to Develop STEM Professionals

Ms. Carrie Houtman, Regulatory Services Leader, Dow Chemical Company
Industry Panel:
Mr. Bryan Dansberry, Project Manager, NASA Johnson Space Center – Education Office
Mr. Scot Lindemann, Vice-President, JR Automation
Ms. Wendy Ljungren, Avionics Chief Consulting Engineer, GE Aviation Systems
Ms. Natalia Powers, Events Manager, The Right Place, Inc.

10:10 a.m. – 11:00 a.m.
Break-out Session 1

11:10 a.m. – 12:00 p.m.
Break-out Session 2

12:15 p.m. – 1:20 p.m.

Luncheon – Eberhard Conference Center

Luncheon Keynote: Panel Discussion — University Response to Industry’s Requirements
Presentation Slides (527 KB)

Dr. Paul D. Plotkowski, Dean, The Seymour and Esther Padnos College of Engineering and Computing, GVSU University Panel:
Ms. Gayle Elliott, Program Director, International Co-op Program, University of Cincinnati
Dr. Chris Plouff, James R. Sebastian Chair of Cooperative Education, Grand Valley State University
Dr. Joy Watson, Asst. Professor and Co-op Advisor, University of Cincinnati

1:35 p.m. – 2:25 p.m.
Break-out Session 3 including
Invited Session: Industry Sponsored Projects: Balancing Academic and Industrial Needs Discussion led by
Dr. Chris Pung, GVSU with panelists Jason Howe, SAF Holland; Tony Slabaugh, Attwood Marine; Jerry Barofsky, L3 Communications; and Todd DeBruyne, Cameron.

2:40 p.m. – 3:30 p.m.
Break-out Session 4

3:45 p.m. – 4:30 p.m.
Closing Keynote: Creating a Globally Competitive Workforce

Presentation Slides (PDF, 2.2 MB)
Policy Innovation in New Mexico (PDF, 361 KB)
Glenn Walters, Deputy Cabinet Secretary for the New Mexico Higher Education Department

4:30 p.m. – 5:00 p.m. Closing Reception and Networking
Additional References Related to the 2013 Advancing the STEM Agenda Conference

Full Conference Program is accessible online: Conference Program

RELATED ARTICLES/VIDEOS

*Quality Approaches in Higher Education Issue*: In celebration of this Advancing the STEM Agenda Conference, the ASQ Education Division published the May 2013 issue of Quality Approaches in Higher Education focused on “STEM education and partnerships among universities, industry, and government that enhance and provide experiential learning to STEM and engineering majors.”

*Quality Approaches in Higher Education May 2013 issue*

New Media Article: MLive Article “GVSU: Experts discuss need for science, math degrees; focus on reducing dropouts”

Grand Valley State University Interchange Newsletter Article: “Grand Valley Will Host the 3rd annual ASQ Advancing the STEM Agenda Conference on June 3-4”

ASQ Education Division’s QEDNews article: QEDNews Fall 2013 issue, p. 7, “Be A STEM-er: A ThirdSuccessful Year for the ASQ Advancing the STEM Agenda Conference” and p. 10, “A Viewpoint: Industry Panel Discussion Fills the Room: 2013 Advancing the STEM Agenda Conference”

ASQ Higher Education Brief, Feb 2013 Article. “Guest Editorial: Collaborate for STEM Success”

ASQ Education Brief, June 2013 article, “Industry Making a Difference in Education”

ASQ Quality Progress, October 2013 article, "Action Required: Grow STEM Opportunities through Active Industry Involvement"

News video from Grand Rapids TV station WZZM13: “STEM Conference to be Held at GVSU “
### Track 1: STEM Partnerships And Collaboration

<table>
<thead>
<tr>
<th>Break-out Session 1: 10:10 a.m. to 11:00 a.m.</th>
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</table>
| **Filling the Gaps: Building and Sustaining a Scientific Workforce**
  Darcie Wallace-Duckworth & Cheryl R. Hild, Aegis Sciences Corporation
  **Paper** |
| **Integration of STEM Community College Curricula and Industry Partnerships through National Certifications**
  Susan Ely, Ivy Tech Community College-Lafayette
  **Paper** |

### Track 2: Teacher Preparation/Preparing Students College-Ready in STEM

| **Next Generation Science: Bridge to the Future**
  Karen Meyers, Regional Math and Science Center, Grand Valley State University (GVSU)
  **Paper** |
| **The Pedagogy of Science Teaching Test**
  William W. Cobern and colleagues, Western Michigan University
  **Paper** |

### Track 3: Higher Education STEM-Improved Learning through Quality Teaching

| **Improvement in Teaching Quality Concepts to Engineers: Measurement, Data Analysis, Experiments and Modeling**
  Chris Plouff, Paul Stephenson, & Shabbir Choudhuri, Grand Valley State University
  **Paper** |
| **Teaching Lean Six Sigma with Service Learning**
  Janet Braun, Western Washington University
  **Paper** |

### Track 4: Decreasing the STEM Gap through Outreach and Systems Thinking

  Michael Tanoff, Kalamazoo Area Mathematics and Science Center & Kathy Grosso, Battle Creek Public Schools
  **Paper** |
| **An Aviation - Themed STEPS Camp for Engaging 7th Grade Girls: Assessment Summary**
  Sara L. Maas, Charles R. Standridge, & Paul D. Plotkowski, GVSU
  **Paper** |
## Break-out Session 2: 11:10 a.m. to 12:00 p.m.

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<td><strong>LASER: Leadership And Science Ensures Results - Evolution of a STEM Partnership Between Industry and Education</strong>&lt;br&gt;Jill Brooks, Raytheon</td>
<td><strong>Synthesizing the Literature Concerning Math Anxiety to Inform a Project on Pre-Service Teacher Retention Rates</strong>&lt;br&gt;Nicholas Flegg, Kamariah Mohamed, &amp; Karen Trimmer, University of Southern Queensland, Australia&lt;br&gt;<a href="#">Paper</a> <a href="#">Presentation</a></td>
<td><strong>An Overview of MIT’s Undergraduate Practice Opportunities (UPOP)</strong>&lt;br&gt;Susann Luperfroy, MIT&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>What Works in STEM Intervention Programs (SIPs) for URM Undergraduates</strong>&lt;br&gt;Raina Dyer-Barr, University of Illinois at Urbana-Champaign&lt;br&gt;<a href="#">Paper</a></td>
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<td><strong>Promoting STEM Education Through the Ford High School Science &amp; Technology Programs</strong>&lt;br&gt;Imad H. Makki, Ford Motor Company</td>
<td><strong>Intel Math Connections: A Three Year Study of the Impact of a Math-Based Program on Elementary Teachers</strong>&lt;br&gt;Matt Feldmann, Goshen Education Consulting, Inc., Adam Weyhaupt, SIUE, &amp; Mary Ann Quivey, Monroe/Randolph Regional Office of Education #45&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>Pedagogical Environments in Chemistry: Effects on Women’s Self-Efficacy Beliefs</strong>&lt;br&gt;Megan L. Grunert, Western Michigan University &amp; George M. Bodner, Purdue University&lt;br&gt;<a href="#">Paper</a></td>
<td><strong>The Hispanic Health Workforce Gap: Creating Fellowship Programs</strong>&lt;br&gt;Michelle Quinteros de Czifra, HSHPS &amp; Suzanne M. Randolph, MayaTech Corp.&lt;br&gt;<a href="#">Paper</a></td>
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### Break-out Session 3: 1:35 p.m. to 2:25 p.m.

**Track 1: STEM Partnerships And Collaboration**

**Invited Session: Industry Sponsored Projects: Balancing Academic and Industrial Needs Discussion**
Chris Pung, GVSU; Jason Howe, SAF Holland; Tony Slabaugh, Attwood Marine; Jerry Barofsky, L3 Communications; and Todd DeBruyne, Cameron.

**Track 2: Teacher Preparation/Preparing Students College-Ready in STEM**

**Teachers 'n Training: Building Formal STEM Teaching Efficacy through Informal Science Teaching Experience**
Georgia Bracey, Molly Brooks, Stephen Marlette, & Sharon Locke, Southern Illinois University Edwardsville

[Paper](#)

**Creating a Foundation for Engineering Education in Five K-12 Rural School Districts**
Stephen Marlette, Allison Fahsl, Gary Mayer, & Georgia Bracey, Southern Illinois University Edwardsville

[Paper](#)

**Track 3: Higher Education STEM-Improved Learning though Quality Teaching**

**Enhancing STEM Education through Project-Based Learning: Barriers versus Benefits**
Susan Mendoza & Robert M. Smart, Grand Valley State University

[Paper](#)

**A Contract Research Organization as a Model for Engaged Learning in STEM**
Mary Nelson (presenter) Craig Caldwell, Salt Lake Community College

[Paper](#)

**Track 4: Decreasing the STEM Gap through Outreach and Systems Thinking**

**Eliminating Confounding Variables to STEM Implementation in a Rural School District Using Mobile 1:1**
Diane Brissette, Greenville Public Schools & James Anderson, Ventra

[Paper](#)

**sHaPe: Camp for Middle School Students**
Kathyrn Agee, Regional Math and Science Center, GVSU

[Paper](#)  [Presentation](#)
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<td>Developing an Advanced Manufacturing Certificate Program for High School Students</td>
<td>Learning by Doing: A Case Study of a Clinical Model for STEM Teacher Preparation</td>
<td>How Do We Know? Inquiry-Based Front Ends for Conventional Topic Treatments in STEM Textbooks</td>
<td>Blending Innovation, Student Co-Learning, Entrepreneurship and Informal Education-Innovation 5</td>
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<td>Christopher Reis, Kettle Moraine School District (WI) &amp; Donald Patnode, Second Chance Partners for Education</td>
<td>Caryn M. King, Grand Valley State University</td>
<td>David Schuster, Western Michigan University</td>
<td>Thomas Deits, Michigan State University &amp; Katherine LaCommare, Lansing Community College</td>
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<td>Pre-Engineering STEM Capstone Project to Design an Oil Cap Remover Tool to Help General Aviation Cessna Pilots Sandy Feola, NCME and Sinclair Community College</td>
<td>Bridging the Creativity and STEM Crisis</td>
<td>Using Models to Teach and Learn Engineering</td>
<td>An Integrative STEM Experience Onboard a Research Vessel</td>
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<td>Sandy Feola, NCME and Sinclair Community College</td>
<td>Daniel Katanski, Eastern Michigan University</td>
<td>Slobodan Urdarevik, Western Michigan University</td>
<td>Janet H. Vail &amp; Michele H. Smith, GVSU</td>
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Networking on Quality in Education
Providing Leadership on Improving STEM Education