

QED NEWS

Quality in Education K-12 • Higher Education • Workforce Development



Editor: Marianne Di Piero

Fall 2011
Vol. XVI, No.3

Educational Innovation



An Early Innovator—Madame Marie Curie
(See pg. 19 for more details)



Visit us at asq.org/edu/

Message From the Chair.....	2
by Cindy Veenstra, Ph.D.	
The Observation Tower.....	3
by Marianne Di Piero, Ph.D.	
2011 Advancing the STEM Agenda.....	4
by Cindy Veenstra, Ph.D. and Julie Furst-Bowe, Ed.D.	
The Education Division Well Represented at the World Conference.....	5
19th National Quality Education Conference.....	6
Improving K-12 STEM Education.....	7
by Kenneth J. Reid, Ph.D.	
STUDENTfacturED—Teaching Quality Systems and Regulatory Compliance.....	9
by Vivian Ngan-Winward, Ph.D.	
ASQ STEM Conference Experience.....	11
by Victoria J. Fawcett-Adams	
Revised Z1.11 Standard Aids Educational Institutions.....	12
by F. Craig Johnson, Ph.D.	
J. Stuart Hunter: Educator Extraordinaire.....	13
Division Financial Position Remains Strong.....	14
by John Dew, Ed.D. and Ted Mattis, MBA	
Help Fund an International Standards Meeting.....	14
Workforce Development Committee Expands Offerings.....	15
by Tom Berstene	
Fall 2010 Membership Survey.....	16
Publications on Quality Education.....	17
Business Plan Performance.....	18
Membership Update.....	19
STEM Education Changing the Direction.....	20
by Cindy P. Veenstra, Ph.D.	
Deborah Hopen Granted Simon Collier Quality Award.....	21
by Marianne Di Piero, Ph.D.	

VISION STATEMENT: Shaping the Future Through Quality in Education and Professional Development

QED News is the ASQ Education Division's newsletter for members with articles contributed by members. It is published twice a year, in the fall and spring.

Message From the Chair

by Cindy Veenstra, Ph.D.

Welcome to the fall issue of *QED News*! Many of our members are starting a new academic year, and whatever your endeavors, we wish you a very successful year! Likewise, we see our fall issue of *QED News* as the beginning of a new year of division activities.

It has been an honor to serve as division chair for the past year, and I am looking forward to leading the Education Division in the next year. I am proud of our leadership team's accomplishments and the directions in which we are leading the division as ASQ's networking division on quality in education and training. Our leadership team is listed on page 22. Our division connects quality systems thinking with education and training efforts to help our communities and society.

With this issue, I have invited Professor Kenneth Reid, director of first-year engineering, Ohio Northern University (ONU), to give a fresh perspective to our *Engineering Education* column. Read about the innovation that is happening at ONU to connect engineering with K-12 teaching. (see page 8)

We have just completed an analysis of our performance to our 2010-11 business plan, and we have exceeded most of our goals. We doubled the number of leaders on our division board, which enabled us to plan for more member activities. We have increased our publications and member use of our website. I am especially excited that we have involved more members in the division's activities; your contributions count in our networking!

We just held a very successful division-sponsored STEM Agenda Conference, July 19-20 at the University of Wisconsin-Stout. Despite the heat, it was a very special networking event. In this chair's message, I particularly wish to recognize the efforts of the administration and staff at the University of Wisconsin-Stout, our conference co-sponsor, and extend my appreciation. It was wonderfully organized to the smallest detail. As a result, we received many compliments from the attendees. Read more about the conference in the article on the STEM Agenda Conference. (see page 4)



Cindy Veenstra with Michele Brinn, speaker at the division's STEM Agenda Conference.

The knowledge gained is beneficial to all members—some of the conference papers discussed innovative assessment and instructional improvement in STEM classrooms; many of these ideas can be used by faculty or trainers in non-STEM fields. All the articles are accessible in our online library, (click on [conference proceedings](#)).

We recently developed a new vision statement that is now on our homepage: *Shaping the Future Through Quality in Education and Professional Development*. At the core of this vision is helping students throughout the world to be successful learners through the use of systems thinking such as the Baldrige Education Criteria, classroom tools of innovation, and professional development. To further define our vision, mission, and goals we plan to use quality approaches such as Hoshin planning and Kano analysis to establish our division priorities. This special activity will include sending our membership several surveys over the next year. (Yes, another survey, and this is an important one!) We would appreciate receiving your responses; both for your personal feedback to our leadership team and to ensure representation of all sectors of our membership. THANK YOU in advance! The surveys will be sent through an e-mail blast from "ASQ Education Division."

We are planning several webinars for this next year; two are already in process. We see this as a way we can provide more networking connection to all our members, and especially to our international members. We will continue publishing our open access, peer-reviewed *Quality Approaches in Higher Education* and our new *Workforce Development Brief* (send us your manuscripts). We have plans to expand our student membership because students are our future educators and leaders! By networking and sharing ideas across our three functional areas (K-12, higher education, and workforce development), we will develop more ideas about innovative approaches and best practices for helping students in our education field.

Follow us on twitter [@ASQ_EduDiv](#) for the latest news. Feel free to drop me an e-mail at chair@asqedu.org.

We hope to see you at NQEC.

About the Author

Cindy P. Veenstra, Ph.D. is principal of Veenstra and Associates and is chair of the Education Division. She is an ASQ CRE and Fellow. Her research includes strategies for improving college STEM student retention.

The Observation Tower: Not Invented Here: Tales From the Dark Side of Innovation

by Marianne Di Pierro, Ph.D.



The American southern writer, Carson McCullers was only 21 years old when she burst onto the American literary scene, dazzling the literati with her novel, *The Heart is a Lonely Hunter*. Set in the 1930s in rural Georgia, the story weaves a gothic tapestry that enmeshes all of its characters in the aftermath of World War I. The war may well be over, but yet another wages within the frame-

work of the text, and this is a war of significant proportion. McCullers well understood the power of isolation: each of the four central characters suffers from debilitating separation, compounded by the awareness of the lack of communication. Despite futile attempts to make themselves heard, the characters talk *at* each other, and *past* each other, but not *with* each other. They fall into stasis and are swept into lacunae over which they heroically attempt to prevail, a feature of modernist literature, which exudes a certain sense of optimism tempered by notions of sound awareness.

Jake Blount is one character whose plight resonates with readers. Ostracized from society, the subject of continual derision, and somewhat off putting because of his aggressive behavior, he rambles throughout the textual landscape, an ostracized individual shunned by others. Caught up in an unfair world of poverty and human misery, of political and economic inequity, he envisions a *different* way and cries, “I am one who knows.” In one passage, Blount bemoans the fact that there are not many people like him, and he says, “But say a man does *know*. He sees the world as it is and he looks back thousands of years to see how it all come [sic] about.... The main thing he sees is that the whole system of the world is built on a lie. And though it’s as plain as the shining sun—the don’t-knows have lived with that lie so long they just can’t see it.”

Frustrated in his efforts, Blount perhaps can be likened to the innovators of the world, those who glimpse the reality of certain situations and who *know* a better way through the creation of dynamic change. Unfortunately, his words fall upon deaf ears, and he is caught up in merciless rounds of vapid arguments with others for whom change is anathema to maintaining the status quo. He is simply ignored and eventually retreats, taking his knowledge with him. That is the sad part—the knowledge vanishes, along with the impetus to *create*—because the

innovators among us are truly creative beings with an artistic perspective. While it would indeed not be true to say that the ideas of “all” creative thinkers are eschewed, it is also true that new ideas are often received with an air of skepticism, indifference, or even suspicion.

I often wonder about the knowledge, enthusiasm, and spiritedness that certain contemporary organizations lose because they are too willing to send their Jake Blounts—their innovators—packing. Sometimes, the “don’t knows” also don’t hear and can’t see into the direction that an innovator thinks is the right way to go. Perhaps one variable that accounts for such resistance is timing—the timing just isn’t right or there aren’t sufficient economic resources to fund such an effort—or simply put, there is resistance to change. The status quo reigns, despite the fact that procedures, policies, and thought or work processes may no longer hold. Joseph F. Engelberger, the famous robotics engineer, teaches that innovations require three elements: a recognized need, competent people with relevant technology, and dedicated finances.¹ They also require leaders who are, themselves, innovators as well—those who will invest in the concept under construction and remain confident, even if the idea itself does not originate with them. This is how new technologies, pedagogies, procedures, and perspectives are born, out of a fertile optimism that says, in effect, “*Yes, let’s give that a try and see what happens.*”

Pioneering spirits, however, are rare. Recently, it occurred to me that self-interest and political affiliations also play a significant role in the abandonment of innovative ideas and innovative people: a venture that is risky may hold opportunities for failure and the wrong political alliances can spell doom, and so there is a perceived need to establish distance. The “not invented here” syndrome results in a certain myopic view that encapsulates individuals “inside” of the box, stifling innovation and precipitating the departure of innovators who cannot get to first base because of institutional or organizational gatekeepers. Withdrawal is the only means of survival, and leave they will, taking their remarkable vision with them.

In McCullers’ novel, language utterly fails, and Blount is effectively silenced, doomed to isolation. It is true enough that Blount may prove a difficult sort and may not always be so likeable, but then, his attitude has been cultivated by an audience steadfast in its refusal to listen to his words. Passionate, repetitive, sometimes surly, and oftentimes given to evangelical sermonizing, he is filled with righteous political conviction. He

“knows” and yet, he suffers from the “knowing.” By the end of the novel, he leaves the small town, but, “He would not leave the South. That was one clear thing. There was hope in him, and soon perhaps the outline of his journey would take form.”

I like to imagine Blount *beyond* that final scene in the novel—ensconced in some fabulous project—surrounded by a circle of those who “know.”

Reference

¹Engelberger, J. F. (1982). Robotics in practice: Future capabilities. *Electronic Servicing & Technology* magazine.

About the Author

Marianne Di Pierro, Ph.D. is director of the Graduate Center for Research and Retention at Western Michigan University. She conducts research on graduate education and also participates in national research projects on doctoral education. She is a dissertation coach, as well as a conflict resolution strategist, working with graduate students and graduate advising faculty. Di Pierro is also associate editor of the *ASQ Higher Education Brief*, as well as editor of the *ASQ Education Division Newsletter*. Contact her at marianne.dipierro@wmich.edu.

2011 Advancing the STEM Agenda in Education, the Workplace, and Society Conference

by Cindy P. Veenstra, Ph.D. and Julie Furst-Bowe, Ed.D.

The Education Division’s first STEM education conference was co-sponsored with the University of Wisconsin-Stout and held on its campus on July 19-20. It was ideal for UW-Stout to host this STEM conference since it is Wisconsin’s polytechnic university and the first winner of the Malcolm Baldrige National Quality Award in higher education.

As the conference developed, it had five distinct themes:

- Numerous methods for involving our youth in STEM programs.
- Strategies for involving more women and minorities in STEM programs and career fields.
- Innovative ideas improve STEM education at all levels and help to engage and retain students.
- Faculty development is essential to success.
- STEM workforce will increase economic growth.



Julie Furst-Bowe gives the conference welcome.

We networked on best strategies to manage K-12 outreach programs for exciting students about STEM careers. The “joy of learning” was evident in several sessions, where robots, virtual car racing, solar cells, Fab labs, graphic novels, and a student-run biotech manufacturing business were discussed. Sessions on confronting stereotypes and balancing the STEM identity with a gender/cultural identity and providing support through learning communities had excellent participation. We learned about new ways of teaching math and computer science, the use of social media to engage students, and quality/innovative tools in the classroom to improve students taking ownership of learning and improving critical thinking skills. We also learned about successful collaboration between K-12 teachers and university faculty and its impact on improving the quality of STEM teaching/learning methods and pedagogy. This conference brought the ideas of quality improvement to the STEM agenda in a unique fashion.

In helping students to transition to the workforce, we learned about how today’s economy is impacting career fields and of the changing role of college career services units. We also learned about the importance of experiential learning such as collaborative projects between colleges and industry and cooperative education programs.

We began the conference activities with four workshops:

- “Development and Continuous Improvement of K-12 Outreach Programs” led by Paul D. Plotkowski, Ph.D., dean of the Padnos College of Engineering and Computing at the Grand Valley State University.



STEM Conference held at Jarvis Hall

- “Using Social Media to Support Interaction and Quality of Student Experience” led by Kevin W. Tharp, Ph.D., assistant professor of information and communications technology, University of Wisconsin-Stout.
- “Effective Strategies in Development Math Education,” led by Deborah Kruschwitz-List, interim math TLC co-director and Kristle Mayer, assistant math TLC director, University of Wisconsin-Stout.
- “STEM From a Job Churning Perspective,” led by Fernando F. Padró, Ph.D., interim director, educational leadership, Cambridge College.

The workshop slides/information and conference papers are available at

<http://asq.org/conferences/stem-agenda/program.html>



Michele Brinn, MA, opening keynote speaker

With the discussions in the pre-conference workshops and at the opening reception, the conference got off to a good start. The next day, our conference began with a breakfast and poster session, followed by a welcome from Chancellor Charles W. Sorensen and Provost Julie Furst-Bowe. Furst-Bowe is also on our division leadership team and serves as our higher education chair. Michele Brinn, our opening keynote speaker, showed us the success of using tools of innovation in the elementary school classrooms to engage students in becoming independent learners.

Our luncheon keynote speaker, president Keith T. Miller, Virginia State University, reminded us of the importance of engaging middle school students in thinking about STEM careers. He noted that one STEM student must be developed at a time in our institutions, requiring a creative and entrepreneurial approach. He challenged us to continue our research and work for improving STEM education. In the closing session, Furst-Bowe summarized the conference sessions and asked us to think about next steps. There were 24 speakers in the breakout sessions. All the papers are in the division library (click on the conference proceedings tab).

We wish to thank our conference co-chairs and conference committee. The conference co-chairs were Julie Furst-Bowe,

Fernando Padró, and Cindy Veenstra. Also serving on the committee were Jeffrey Anderson, Mary Hopkins-Best, and Deanna Applehans. A special thanks to Becky Martin for making the trip to greet attendees from our booth.

The review of the papers was a typical academic review cycle, including an abstract, an initial paper, a peer review by two to three reviewers, and request for revisions to the papers based on the feedback from the peer review. Thirty-five of our authors volunteered to be reviewers for our peer-review process. The feedback from our reviewers was well thought out and contributed to the quality of the final papers. Thank you to all the reviewers, authors, presenters, workshop leaders, and to our keynote speakers. You made the conference a success!



The Education Division Well Represented at the World Conference

The leadership team enjoyed meeting Education Division members who attended the 2011 ASQ World Conference on Quality and Improvement last May in Pittsburgh. Here are some of the highlights:

- The Education Division’s business meeting was a success with a summary of the division’s activities by Cindy Veenstra and a visioning session led by Ted Mattis.



Professors Jami Kovach and Lee Revere at their well-attended WCQI session.

- The Baldrige in Education brainstorming session had good participation and the outcome from that meeting is a new project to develop a 10-year compendium of Baldrige in Education led by our higher education chair, Julie Furst-Bowe. Contact her at Compendium@asqedu.org for more details.
- At the DAC leadership meeting, the Education Division was recognized for its achievement of being one of the 13 divisions awarded the J.S. McDermond Total Quality Award (2009-2010) and one of six divisions awarded the Bronze Quality Excellence Award.
- Five sessions were sponsored by the Education Division, the most sessions that the division has sponsored at the World Conference. These included the ICQI workshop on “STEM Education: Changing the Direction” led by Cindy Veenstra and Julie Furst-Bowe, the “21st Century Leadership” series of three sessions with Deborah Hopen, Christine Robinson, and Liz Peotter, as well as the session, “Online Technologies that Improve Engaged Learning” by Jamison Kovach and Lee Revere.
- We met and networked with many of our members at our new booth exhibit, which received many compliments.

19th National Quality Education Conference Slated for Indianapolis This November



Dr. Jay Marino, NQEC keynote speaker

Join us at the 19th National Quality Education Conference in Indianapolis, IN, November 6-8, 2011. This year’s theme is *Inspiring Quality Education Worldwide: A Systems Perspective*. Our own Jay Marino is one the keynote speakers! In addition, Jay and Becky Martin will lead an Education Division-sponsored workshop, *Overview of the Baldrige Framework for Continuous Improvement for K-12 Educators*. The division will also be there in full force

with its new booth exhibit and lots of handouts, so join us! If you would like to volunteer to help with the booth, please contact Cindy Veenstra at chair@asqedu.org.

Here is a description about the focus of this year’s conference:

NQEC reflections from J. Jay Marino, Ed.D. and Jan Polderman

Can you provide some insight into what you’ll be talking about at the conference?

The NQEC 2011 keynote presentation titled, “Creating a Culture of Continuous Improvement for 21st Century Learning and Leadership in a Global Community” will focus on how continuous improvement has no geographic or cultural barriers. We’ll be comparing and contrasting the Dutch and American systems of education, defining 21st century leadership in educational organizations, demonstrating 21st century learning in Dutch and American schools, and providing recommendations on creating a culture of continuous improvement.

Why is quality in education important?

Embracing a philosophy of “quality” sets educational organizations on a path of continuous improvement. Quality in education is important because it encompasses many best practices of organizational change. Key concepts embraced by quality school systems include: setting and communicating direction throughout the system; aligning goals at all levels; encouraging stakeholder participation in improvement efforts through teamwork, collaboration, and shared leadership; using data to guide decision making; and measuring customer satisfaction to name a few. Quality in education is designed to empower students,



The Division’s booth at the 2011 WCQI.

Improving K-12 STEM Education: Ohio Northern University's Engineering Education Program

by Kenneth J. Reid, Ph.D.

In the National Academy of Science (NAS) report titled, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (National Academy of Science, 2006), the authors noted that:

“Education in science, mathematics, and technology has become a focus of intense concern within the business and academic communities. The domestic and world economies depend more and more on science and engineering. But our primary and secondary schools do not seem able to produce enough students with the interest, motivation, knowledge, and skills they will need to compete and prosper in such a world.”

Our society is dependent on advances in engineering and technology, and the rate at which this dependency grows is increasing. The NAS report goes on to describe the criticality of advances in engineering and technology to the nation's social and economic conditions and discusses changes that must occur in the K-12 education system to promote engineering and technology for the United States to compete, prosper, and be secure in the global community in the 21st century.

ASQ commissioned a market research firm to study teacher knowledge and passion for math and science (Stansbury, 2010). The results show that, while students consider their teachers knowledgeable about math and science, students think teachers do a poor job of discussing STEM careers and/or encouraging students toward the STEM disciplines. The study notes that:

“Although 85 percent of students said their teachers deserve at least a ‘B’ when it comes to knowledge about science topics (55 percent of students gave their teachers an ‘A’), 63 percent of high school students said their teachers are not doing a good job of talking to them about engineering careers (‘C’ or lower), and 42 percent of high school students said their teachers don’t ably demonstrate how science can be used in a career (‘C’ or lower).”

The National Academy of Engineering report *Engineering in K-12 Education: Understanding the Status and Improving the Prospects* (National Academy of Engineering, 2009) cites three main goals driving the study:



staff, and stakeholders to drive improvements that bring about organizational results; the mission of most school systems.

What do you think attendees should get out of the conference?

In short, participants at the conference should return to their systems different than when they left. They should expect to experience firsthand how educators around the country are improving student achievement and creating 21st century educational learning environments. Networking with other educators on a continuous improvement journey, participants should have the contacts, resources, and examples to drive their improvement efforts to the next level. Participants should leave the conference inspired to transform their school systems.

Do you have other advice or insight to share with readers?

Continuous improvement is a journey, not a program. The pace of the journey is a marathon, not a sprint. One of the most important insights is the importance of creating a culture of change within the system. Until stakeholders have a sense of urgency to do anything different, they will likely not embrace a continuous improvement approach.



Rebecca Martin, NQEC workshop leader and K-12 Continuous Improvement Facilitator, Cedar Rapids Community Schools, Cedar Rapids, IA

Check out Becky Martin's Quality in Education Blog

<http://community.asq.org/edu>

1. There are multiple perspectives about the purpose and place of engineering in the K-12 classroom. These points of view lead to emphases on very different outcomes.
2. There has not been a careful analysis of engineering education within a K-12 environment that looks at possible subject intersections.
3. There has been little, if any, serious consideration of the systemic changes in the U.S. education system that might be required to enhance K-12 engineering education.

All of these goals describe the importance of a necessary, systematic change in the incorporation of engineering within K-12. Existing efforts to introduce engineering into K-12 have typically consisted of in-service activities for teachers and summer camp experiences and/or single day in-class events for students. While these activities may effectively reach participating individuals, integrating engineering fully into the classroom environment requires more than reaching a handful of students in summer camp settings and more than scattered in-service events for teachers. Systematic change will require a new paradigm—one that focuses on developing effective, engaged teachers who have deep content knowledge in engineering as well as the pedagogical tools to teach within the K-12 environment.

To address this new paradigm, the T.J. Smull College of Engineering at Ohio Northern University (ONU) introduced a new major, leading to a bachelor of science degree with a major in engineering education. In 2011, ONU and the Ohio Board of Regents approved this degree. The program provides graduates with a foundation in engineering, mathematics, and education, qualifying the graduate for licensure as a secondary math teacher in the state of Ohio. The degree is similar to a general engineering degree available in some other universities, expanding potential career opportunities to general engineering sales, training, and unique opportunities in venues such as science and technology museums. Four students are enrolled in the program starting in the fall of 2011 and are scheduled to graduate in May 2015.

This new and innovative program in engineering education offers an opportunity for ONU to introduce teachers who have an accurate perception of engineering as a profession into K-12 schools. These teachers will understand that engineering is more than just “math and science,” but includes dimensions of creativity, innovation, service to society, and an entrepreneurial mindset. This is a major step toward a necessary, systemic change that must occur to have a positive effect on engineering



education within K-12 and hopes to have a long-term impact on the shortage of engineering and science college graduates.

References

National Academy of Science. (2006). *Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, National Academies Press.

Stansbury, M. (2010). “Survey: American Educators Aren’t Discussing STEM Careers With Students.” *ESchool News*, <http://www.eschoolnews.com/2010/02/25/educators-not-discussing-stem-careers/>.

National Academy of Engineering. (2009). *Engineering in K-12 Education: Understanding the Status and Improving the Prospects*, National Academies Press.

About the Author

Kenneth Reid, Ph.D. is the director of first-year engineering and an associate professor of electrical and computer engineering at Ohio Northern University. He was the seventh person to receive a Ph.D. in engineering education from Purdue University. He is active in engineering within K-12, serving on the JETS board of directors and also serving ten years on the IEEE-USA Precollege Education Committee. His research interests include success in first-year and K-12 engineering. His e-mail address is k-reid@onu.edu.

Volunteer to Help the Division

Check out opportunities to participate in the division’s activities. We welcome your participation.
<http://asq.org/edu/interaction/getinvolved-edu.html>



STUDENTfactorED—Teaching Quality Systems and Regulatory Compliance Using a Contextual, Real-World Biotech Manufacturing Environment

by Vivian Ngan-Winward, Ph.D.

Biotechnology is a STEM field that has experienced dramatic growth over the past 10 years, weathering the recent depression relatively unharmed. In 2010, the U.S. biotechnology industry showed a net income of \$4.9 billion, and employed 112,200 workers at 1,726 companies (Beyond Borders, 2011). This performance represents across-the-board increases compared to 2009: 33% in net income, 5% in employees, and 1% in number of companies. Biotechnology business leaders are predicting steady growth over the next decade, meaning well-trained workers will be in high demand.

Defined as technology based on biology, specifically using cellular and biomolecular processes in the development of new products and technologies, biotechnology has broad applications ranging from agriculture and food (e.g. transgenic crops and food safety) to the environment (e.g. biofuels and bioremediation) to healthcare (e.g. drugs, vaccines, biopharmaceuticals, personalized and regenerative medicines, diagnostic kits, and medical devices). The use of some of these products and technologies is associated with moderate to high risk. Consequently, this industry is tightly regulated by the Food and Drug Administration (FDA) in the United States.

To effectively prepare for a career in biotechnology, a selection of STEM coursework (e.g. fundamental biology, chemistry, and math courses) appropriate for the job is obviously important. Even more so is a solid foundation in quality and regulations concepts and skills, especially for workers on the manufacturing end of this industry's continuum. This is not to say that those in biotechnology research and development (R&D) need not be versed in quality and regulations. On the contrary, these workers have assumed roles that directly impact the products' manufacturability and overall quality, characteristics to address in the design stage if product transfer to manufacturing is to be successfully and efficiently executed in a regulated environment.

Foundational knowledge and skills in quality and regulations is valuable indeed, but little effort is made during the course of various STEM educational pathways to teach such concepts and skills. Imagine how much better biotechnology companies could operate if workers entering the field not only understood basic

quality concepts such as documentation and traceability, design specifications, supply chain management, validation, and good manufacturing practices (GMP), but also knew how to apply them in their day-to-day tasks to ensure that the company maintains FDA compliance. Unfortunately, quality and regulations training is typically acquired on the job, delivered by either more experienced co-workers or a third party offering specialized training.

While this on-the-job training strategy is acceptable, it is not optimal for a number of reasons. The worker and the organization both suffer reduced productivity until the worker is fully trained, which may require years. If specialized training is scheduled, it will cost the organization money and employee time. For the worker, learning on the job can be very inefficient because of conflicting priorities (complete the training or the assigned work), and rarely results in an immediate deep and meaningful understanding of the concepts and skills in question because training time and opportunity to practice are both limited.

Salt Lake Community College (SLCC) recognized the need for better quality and regulations preparation and responded by developing the biomanufacturing program with a curriculum focused on quality systems and FDA regulations to support a diverse local biotechnology manufacturing industry. Through the program's comprehensive coverage of quality basics and how these concepts can be exploited to achieve regulatory compliance, students can gain a thorough understanding of quality concepts and skills. Despite this intention, students find mastery of key quality and regulations concepts and skills challenging because these topics are very dry. Their value is not immediately recognized or appreciated so students are not compelled to put forth the effort necessary to really learn the material. In addition, quality systems and FDA regulations are very complex and not easily interpreted. Consequently, students struggle with learning, applying, and retaining the knowledge and skills presented.

To address this challenge, SLCC created a student-run, biotechnology-based contract manufacturing organization, called STUDENTfactorED, to provide a real work environment. Here students can apply learned quality and regulations concepts and skills and see firsthand how they relate to a particular job role within the company, as well as how they impact the overall operation of the business in this high-growth STEM field. STUDENTfactorED will require interested students from the biomanufacturing program as well as the various SLCC's school of business programs, such as accounting, management, and marketing, to work in real positions typical of biotechnology manufacturing companies.

Faculty and staff from these programs serve as mentors and supporting subject-matter experts. While “working” at STUDENTfacturED, students will be involved in the manufacture and sale of biotechnology instructional reagents and supplies to SLCC’s instructors and local high school teachers. This low-risk product focus and unique biomanufacturing/business learning community permits the creation of a low pressure and supportive yet contextual and real-world learning atmosphere for students. By allowing students to apply and practice those job-critical concepts and skills in an environment tolerant of mistakes students might make, this innovative project-based learning strategy should promote efficient learning, deeper understanding, and a genuine appreciation of quality systems and regulations, as well as improved retention of this subject matter.

All students participating in STUDENTfacturED will be encouraged to cross over into positions not affiliated with their program of study to experience functions in both the business and manufacturing aspects of the organization. All students, therefore, will have the opportunity to master, or be exposed to at minimum, competencies essential to biomanufacturing, such as:

- Understanding vendor qualification and supply chain management.
- Applying cost analysis and cost of quality.
- Complying with good manufacturing practices and document control policies.
- Tracking materials and production activities.
- Managing resources and production scheduling.
- Performing quality control and quality assurance activities and lean manufacturing.

- Critical thinking for troubleshooting and problem solving.
- Understanding quality management systems, ISO 9001 certification, and federal regulations.
- Providing customer service and technical support.
- Supporting a continuous improvement effort.

Additionally, students can “try on” different job functions to determine which one(s) they prefer and which career path(s) they are interested in pursuing.

SLCC is currently establishing the infrastructure for STUDENTfacturED, and the company is expected to welcome its first cohort of student workers in January 2012. For the past two semesters, however, an ad hoc version of STUDENTfacturED operated to serve biomanufacturing program students. Participants learned how to draft and validate procedures, batch records, and bill of materials necessary for producing kits designed to support a National Science Foundation STEP grant-funded project [Craig Caldwell, Principal Investigator] intended to increase the number of U.S. students receiving STEM-related degrees. This particular project brings the genomic sequencing of *Halorubrum salsolis*, a halophilic bacterium recently discovered in the Great Salt Lake, into local high schools to engage students in pursuing a biotechnology career.

Until STUDENTfacturED is fully implemented, the exact impact that this business enterprise will have on student learning and mastery of quality and regulations concepts and skills is unknown. Nevertheless, this innovative project-based learning strategy and unique learning community have considerable potential to transform STEM education by not only teaching students conceptual knowledge in biomanufacturing and business as well as quality systems and regulations, but also providing genuine work experience in a biotechnology manufacturing company, valuable confidence, and big-picture understanding in a career path of interest.

Reference

Beyond Borders. (2011). Global biotechnology report 2011, <http://www.cy.com/GL/en/Industries/Life-Sciences/Beyond-borders--global-biotechnology-report-2011>.

Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. 1003292; Vivian Ngan-Winward, principal investigator. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

About the Author:

Vivian Ngan-Winward earned a Ph.D. in molecular biology and biochemistry from Wesleyan University in 1991. After nine years in academic research, she entered the biotechnology industry, working as a scientist in R&D as well as regulatory affairs. In 2008, she returned to academia as the biomanufacturing program director at Salt Lake Community College to develop and implement a biotechnology manufacturing training program with a quality and regulatory focus. She recently earned ASQ CQE certification. She can be reached at vivian.ngan-winward@slcc.edu.

ASQ STEM Conference Experience: A Doctoral Candidate's Observations

By Victoria J. Fawcett-Adams

Flying into Minneapolis in July to visit relatives is a reasonable choice for a Virginia teacher on summer vacation, one would think. Combining a conference presentation in Menomonie, WI, to the trip, however, adds a scholarly aspect for a teacher-researcher who is also a doctoral candidate seeking to expand her horizons!

Recently I had the great privilege of attending the ASQ STEM Agenda conference at Wisconsin-Stout, July 19-20, 2011. Although my paper submission did not make the cut for presentation, I was generously given the opportunity to present my research via a poster presentation, which I gladly accepted. Little did I know how receptive the attendees would be to my research thesis, which was displayed on the poster during the morning breakfast session.

My research focuses on the "motivation of adults who choose science careers," and since I am a doctoral candidate, this conference gave me an opportunity to display my work, thus far, to learned scholars in the STEM disciplines. Going into this process I realized I was opening myself up to a world of scrutiny, shredding my preliminary literature review and two pilot studies apart, yet I went willingly to vet my work as a scholar. To my surprise, my poster attracted a crescent of interested discussants that more resembled a round-table discussion. I was very pleased at the ensuing discussion around my topic because this conference fulfilled all of my expectations of a targeted audience focused on STEM in education, the workplace, society, and in research.

The attendees had knowledge in the field and were experienced practitioners or budding researchers. There was a great sense of "like-mindedness," so that we felt in familiar company, and as if no one was a stranger. There were so many ways that the ideas intertwined from the opening workshops, luncheons, paper and poster presentations, and main speakers. The scholarly environment invited the sharing of ideas and experiences that built momentum and consensus as the conference proceeded.

Additionally, I became part of a community of learners by participating as a conference paper reviewer. This process was extremely valuable because it allowed me to see what goes on inside an organization that I was trying to become part of, and to understand and learn from the conference application process. Conference participation led to my work, thus far, being published on the ASQ Website, which is a commendable credit for any academic.

I met many people at the ASQ STEM conference from all over the country who I will retain as contacts in the field to foster friendships, dialogue, and to share research. The conference also showed just how important it is as a graduate student to attend or present at these conferences. It is an excellent way to show your willingness to collaborate, meet new people, and find out what others are working on in the field. Student membership is also available. The networking helped me with developing ideas for STEM research because I was able to see my work through the eyes of others, scrutinize comments, and decide how to handle various perspectives in my research and writing.

Chair's Quotes

"The integration of student feedback into the quality assurance process is currently common to most institutions world-wide."

– Chenicheri Sid Nair and
Lorraine Bennett,
QAHE June 2011

"the development of engineering standards for K-12 is not as much a matter of *if* as a matter of *when* and *how* they are to be implemented"

– Kenneth Reid and
Eric T. Baumgartner,
*2011 Advancing the STEM Agenda
Conference Proceedings*, July, 2011.

"From realigning administration surrounding school-wide support services to training a team of informal Kaizen team leaders, the Carlson School of Management at the University of Minnesota embedded continuous improvement into normal operations."

– Mychal Coleman and Erin Barwis,
QAHE June 2011

"Academies help students explore colleges and careers while learning critical 21st century skills so they graduate ready and are prepared for college, careers and life."

– Jay Steele, *ASQ Primary and Secondary
Education Brief*, May 2011

"The lack of women pursuing STEM degrees not only results in the loss of valuable perspectives and experiences necessary for the advancement of science and technology, it also creates an unbalanced societal power structure."

– Jennifer A. Skaggs,
*2011 Advancing the STEM Agenda
Conference Proceedings*, July, 2011.

"At its best, the study of the liberal arts and sciences develops the abilities to find similarities among dissimilar things, common ground among the uncommon and meaning in the midst of meaninglessness."

– Ken Anselment, *ASQ Higher Education
Brief*, June 2011

"The time has come for educators and professional staff to pool their skills, talents, and initiatives and propel students, collaboratively, toward success."

– Marianne Di Pierro, *ASQ Higher
Education Brief*, April 2011

Overall, it is a good feeling to be part of a group like {the} ASQ Education {Division} with so many different ways to examine issues and build a cohesive community of learners, especially when you are a graduate student.

About the Author:

Victoria J. Fawcett-Adams (Vicki) is a third-year, Ed.D. doctoral candidate, organizational leadership, in the graduate school of education at Shenandoah University, Winchester, VA. Her research has focused on science career motivation and influences paying attention to STEM program creation, environmental factors, and policy decisions. She can be reached at vfawcett08@su.edu.

Revised Z1.11 Standard Aids Educational Institutions

by F. Craig Johnson, Ph.D.

The newly revised ANSI/ASQ Z1.11—2010 Quality Management System Standards Requirements for Education Organizations is in its final stages of production now and will be available to organizations from ASQ in the fall. Members of ASQ's Education Division have been involved in the development and use of this standard throughout its life. For this third edition, 30 Education Division members contributed, including 15 division members from countries outside the United States.

The general purpose of Z1.11 is enhancing satisfaction through an effective management system, improving the system continually, and knowing the degree to which the education organization fulfills its requirements, controls its resources, and stabilizes its processes. The standard addresses the following areas:

- Designing, developing, and delivering instruction.
- Testing students' learning.
- Supporting research.
- Providing public service.
- Maintaining support services.
- Meeting students' academic needs.
- Meeting expectations of interested parties.
- Conforming to applicable legal and regulatory requirements.

When educational organizations comply with the standard's requirements, they can be expected to generate consistent learning by implementing the following:

- Strategic plans to identify academic strengths, weaknesses, opportunities, and threats.

- Action plans to integrate curriculum, learning objectives, technology, teaching methods, and results.
- Effective learning that completes planned activities and achieves planned results.
- Instructional and administrative Plan-Do-Check-Act cycles to improve teaching and learning processes.
- Analysis of performance results to identify process improvement opportunities.
- Processes for addressing concerns of students and other interested parties.

The current guidance standard was changed to a requirements standard partially in response to legal and regulatory requirements included in the "No Child Left Behind Act of 2001." That public law clearly implied the importance of establishing a quality management system in its 2,756 quality management requirements involving requirements for customer focus for students and other interested parties, data, process approach for teachers and staff, leadership, and continual improvement as well as mutually beneficial relationships with suppliers, etc.

The revised version of Z1.11 also was intended to help explain *ISO 9001:2008 Quality Management Systems—Requirements* in terms relevant to educators and school administrative personnel. There are many organizations using the ISO standard as a framework for education improvement that had requested this action—from elementary and high school districts, to colleges and universities, regional education centers and consortiums, and technical schools focused on adult education and workforce development.

As with all national standards, Z1.11 will be revised in the future to reflect new developments in the field, as well as the real-life experience of those educational institutions that apply it. Education Division members and their organizations are encouraged to review the new standard and apply it in their unique situations. Feedback from these experiences is vital to improving the standard continually, which is a primary goal of the ANSI standards program. There are many opportunities for

Quality Approaches in Higher Education The Education Division's peer-reviewed journal

We welcome articles from all academic disciplines on quality in education topics, including: Baldrige, Kaizen, Lean, social justice, and improving student success. Consider being a reviewer for this journal.

<http://asq.org/edu/quality-information/journals/>

division members to get involved in the standards development and implementation processes, as Z1.11 moves forward with its new approach.

About the Author

F. Craig Johnson is an ASQ Fellow and the Education Division's representative to the ASQ Standards Committee, which he chairs. He chaired the writing group for the American National Standards Institute American National Standard Z1.11—Guidelines for the Application of ISO 9001 to Education and Training Institutions. He was the American National Standards Institute lead expert for developing ISO Guidelines for Training and for developing ISO 10015. Currently he chairs the ISO Task Group on Fundamentals and Vocabulary. He is a member of the U.S. delegation to the ISO Technical Committee 176 for Quality Management Standards. He is the ISO Subcommittee 1 representative to the ISO TC 179 Task Group on Quality Management Principles. He has a doctorate in communication from the University of Wisconsin. He taught at Ohio University, Michigan State University, and at Florida State University during a 40-year career in higher education. He is a charter member, past president, and Distinguished Member of the Association for Institutional Research. Contact him at fcjohnson@fsu.edu.

Member Profile

J. Stuart Hunter: Educator and Innovator Extraordinaire

The Education Division is pleased to acknowledge the accomplishments of the preeminent statistician and educator, J. Stuart Hunter. Hunter was recognized as an ASQ Honorary Member, the highest membership achievement possible, in 1998 and has been a member of the Education Division since the following year. Hunter also is a noted author and editor, who has helped countless practitioners gain a deeper understanding of industrial engineering concepts such as efficiency, quality, reliability, and safety.

“Stu Hunter has made an invaluable contribution to our field and mankind during his career,” commented ASQ past president, Deborah Hopen. “Recognizing him as an Honorary Member was the inevitable outcome of his lifetime dedication to furthering our awareness of quantitative methods—and doing so in a way that demystified their application and meaning.”

Hunter attended North Carolina State University, receiving his bachelor's degree in electrical engineering, a master's degree in engineering mathematics, and a doctorate in experimental statistics. He began his career as a staff statistician for American Cyanamid Co. Then he joined the Mathematics Research Center at the University of Wisconsin. Ultimately, Hunter

became professor emeritus at Princeton University's School of Engineering and Applied Science.

Statistics for Experimenters, the book he co-authored with E.P. Box (another ASQ Honorary member) and W.G. Hunter, is considered one of the major works in the field. Hunter also published the textbooks, *Design of Experiments* and *Statistics for Problem Solving and Decision Making*, which was used in his television series. Hunter was the founding editor of *Technometrics*, the quarterly journal co-published by ASQ and the American Statistical Association. His articles and technical reports have appeared in publications across the globe and have addressed topics including the industrial applications of statistics, the fractional factorial, and response surface experimental design.

In addition to his incredible contributions to ASQ, its members, and the quality field, Hunter is a fellow of the American Statistical Association, the Royal Statistical Society, and the American Association for the Advancement of Science. He served as president of the American Statistical Association in 1993. He also is a member of the American Society for Testing Materials, the American Institute of Chemical Engineers, the Institute of Industrial Engineers, the Institute of Mathematical Science, the Biometrics Society, and the Environometrics Society, of which he was a founding member.

Organizations across the world have recognized Hunter's contributions with the following honors:

- ASQ Brumbaugh Award in 1959 and 1985 for the paper, published in the preceding year, that has made the largest single contribution to the development of industrial application of quality control.
- ASQ Shewhart Medal for technical leadership in 1970.
- ASQ Statistics Division's Ellis Ott Award in 1978.
- ASQ Metropolitan Section's Deming Medal in 1986.
- U.S. Army's S.S. Wilks Medal.
- Environometrics Society established the J. Stuart Hunter Annual Lecture.
- Korean Research Institute of Standards and Science (KRISS) lecturer—KRISS promotes the industrial competitiveness of Korea by advancing measurement standards, science, and technologies.
- National Center for Industrial Science and Technology Management Development lecturer in Dalian, China.

Hunter taught courses on evolutionary operation, factorial and fractional factorial design, and response surface methodology for ASQ's Chemical and Process Industries Division, as well as the American Statistical Association's Section on Physical and Engineering Services.

Hunter's Shewhart Medal citation recognizes his "outstanding contributions in the development and application of statistical techniques for engineering and industrial needs and his inspiring leadership in applying these technologies to quality control." In his Shewhart Medal speech, Hunter said, "The rational man who solves problems has to be an articulate man. He has to be able to use the English language well, but he also has to be a quantitative beast if he is going to solve his problem." Surely the rational and articulate Hunter is just such a quantitative beast.

Division Financial Position Remains Strong

by John Dew, Ed.D. and Ted Mattis, MBA

At the close of the last fiscal year on June 30, 2011, the Education Division continued to have a solid fund balance and adequate reserves. Balances in our checking and money market savings accounts exceeded \$52,000 and our reserve fund had grown to almost \$13,000. These values represent more than three times our annual operating expenses in years where we are making significant investments in new products and services. This strong fiscal position reflects thoughtful leadership, careful fiduciary management practices, and continued growth of division activities. The division Auditing Committee certified these values in conjunction with its recent review of the division's transactions.

During this prior fiscal year, the division's membership continued to grow, and retention remained at a level far exceeding most ASQ divisions. Results of our annual member survey indicated high levels of satisfaction with the division's products and services, providing a positive forecast for future years' membership trends. The division devoted almost \$19,000 to maintaining and/or expanding member benefits, including introduction of the new *Workforce Development Brief*, launching the new STEM Conference, publishing two issues of *Quality Approaches in Higher Education*, collaborating on the development of multiple editions of the *K-12* and *Higher Education Briefs*, and establishing a stronger presence at the World Conference for Quality and Improvement.

With these substantial funds available to support the current division activities and exploration of new products and services, the Education Division should be able to build a stronger base of satisfied members and retain a strong fiscal position.

About the Authors:

John Dew is an ASQ Fellow and past chair of the Education Division. Contact Dew at: jrdew@troj.edu.

Ted Mattis is ASQ Education Division treasurer and Community Colleges Chair. Contact by e-mail at: ted.mattis@woodward.com.

Help Fund an International Standards Meeting Demonstrate Commitment as a Quality Organization

The International Organization for Standardization (ISO) Technical Committee (TC) 176 is comprised of members who develop international standards on quality management and assurance, including the ISO 9000 series. Members of the U.S. Technical Advisory Group (TAG) to ISO/TC 176 develop the U.S. positions on quality standards.

Each year a different member country hosts the plenary meeting of ISO/TC 176 for ISO 9001:2008 revisions. Although the United States plays a significant role on the committee, it has not hosted this international meeting in 10 years. TAG 176 formed the U.S. International Standards Connection Fund to help raise at least \$100,000 to host this meeting.

While most countries' standards development organizations (SDOs) receive financial support from national governments, U.S. SDOs do not receive funding from the government. TAG 176 is administered by two nonprofit organizations, the [American National Standards Institute](#) and the [American Society for Quality](#), and is partially supported by member dues to cover TAG operating costs. Funds to host this meeting will come almost entirely from individual donations and corporate sponsorships.

A U.S. meeting would emphasize the country's position as a pacesetter and allow for increased influence in ISO 9001 development by having a larger delegation. It will reduce travel costs for our TAG members, who are volunteers, and will enable more of them to attend.

There are tax-deductible sponsorship opportunities from \$2,500 to \$50,000 to highlight your organization's commitment to quality and the development of international standards. Opportunities range from banners recognizing

sponsorship, to placement of company logos on meeting bags. Donations of any size are welcome and will be recognized online and in TAG literature.

You may contribute online at <http://asq.bbnw.org/donate.php> or by check payable to “U.S. International Standards Connection” and at your earliest convenience to:

ASQ/Standards
600 N. Plankinton Avenue
Milwaukee, WI 53201-3005

Consider this: if every U.S. company that is registered to ISO 9001:2008 donates \$10, we will reach our goal.

A tax-deductible donation would highlight your organization’s position in the global economy and demonstrate to your employees, clients, and competitors that your organization values quality. Your support of an international audience of quality experts also increases your organization’s visibility.

International standards developed by ISO/TC 176, including the ISO 9000 series, bring consistency, reliability, and quality to the global market. They contribute to making products and services more efficient, safer, and cleaner. The standards make global trade easier and fairer. Widespread adoption of international standards also means suppliers can base development of their products and services on reference documents that have broad market relevance.

Even if your organization doesn’t use these standards, many small and medium-sized enterprises in your supply chain do to ensure their continued ability to serve your organization. ISO 9001-registered companies traditionally demonstrate higher levels of quality, reliability, and responsiveness to customer needs.

For more information about how you can support the meeting and sponsorship opportunities, contact Jennifer Admussen at standards@asq.org or call 800-248-1946, ext. 7736. Visit ASQ at <http://asq.org/>.

Keep Up To Date on the Division’s Activities

Follow us on Twitter – ASQ_EduDiv or click the twitter button on the homepage, asq.org/edu/

Workforce Development Committee Expands Offerings

by Tom Berstene

The Education Division’s Workforce Development Committee successfully launched the new publication, the *Workforce Development Brief*, about a year ago. The *WFD Brief* has received very favorable feedback, and all three issues have been featured as an “editor’s pick” on ASQ’s Knowledge Center. Several other divisions’ members now have access to this publication in conjunction with a collaborative effort the Education Division is sponsoring. Short articles (-1,200 words) on related topics should be submitted to the *WFD Brief*’s editor at debhopen@nventure.com.

The next issue will be available in September, and it will include an article by Kenny “The Monk” Moore, the well-known co-author of the best-selling book, *The CEO and the Monk*. Moore’s article presents a staged model of change, called the “four-room apartment” that can serve as a foundation for determining how to foster lifelong learning in the workplace. This article sets the stage for the webinar, “Engaging Employees in the Learning Organization,” which Moore has recorded for Education Division members. This link to the webinar will be included in the article, and the webinar will be accessible 24/7 at no charge to members. Its insightful discussion is sure to offer some new ideas.

The Workforce Development Committee also will include information on how to access its new community networking site in that issue. This network will make it easy for members interested in workforce development to post articles, blogs, and messages so that real-life experiences can be exchanged and applied in other members’ efforts. Adina Suciuc will coordinate the network, and she brings a wealth of knowledge related to social networking to her role.

Other projects planned for this area include the following:

- A collaborative effort with the Team and Workforce Development Forum to develop a shared body of knowledge on workforce development and sponsor a competition to generate new articles to include in it (coordinated by Belinda Chavez and Steve Pollock).
- A desktop reference publication (short, pamphlet-sized book) on a topic related to workforce development (coordinated by Christine Robinson).
- An additional archived webinar and associated article by a

well-recognized presenter who provides a unique perspective on the field of workforce development (coordinated by Belinda Chavez).

- A three-part virtual workshop taught by Margaret Murphy, a division member who is known for her experience in adult learning. Murphy's articles in the first three issues of *Workforce Development Brief* are a foundation for this course (coordinated by Debbie Hopen).

Finally, this committee will be strongly supporting the division's involvement in the ASQ Standards Committee. The newly released *ANSI/ASQ Z1.11 – 2010 Quality Management System Standards—Requirements for Education Organizations*, work on ISO/TC Committee 232 on learning services for non-formal education and training, and other similar standards activities are related directly to the arena of workforce development. Therefore, absorbing this project into our committee should improve our ability to communicate developments and notify members of input opportunities, etc.

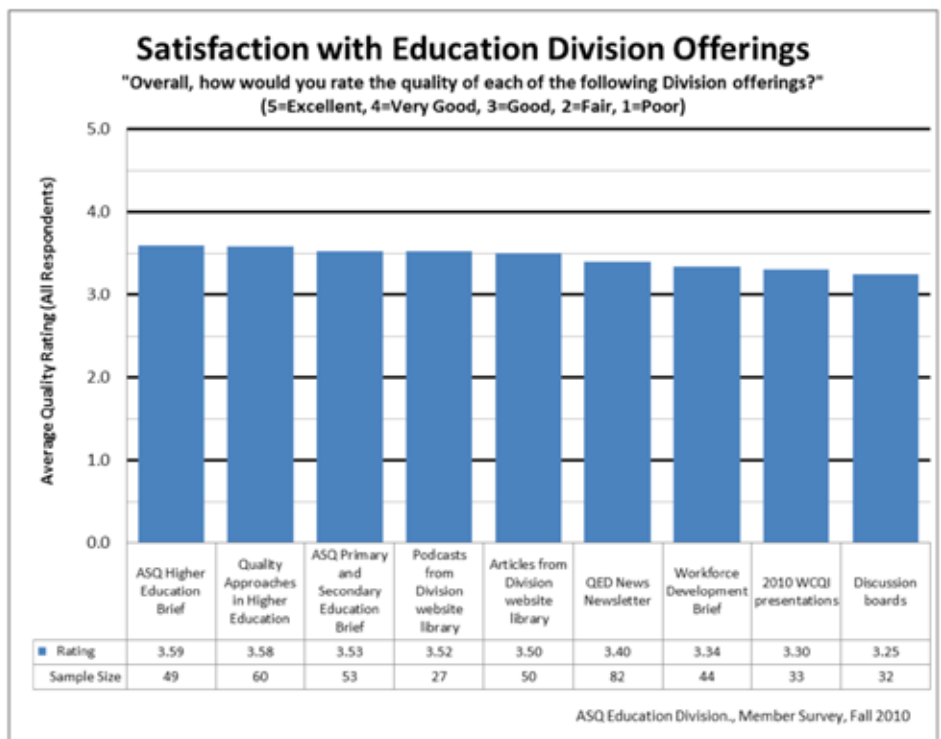
As the new chair of the Workforce Development Committee, I am pleased to share our ambitious program for the next 18 months with you. If you are interested in getting involved in any way, please contact me at tberstene@workforceplanning.com.

About the Author

Thomas G. Berstene is the founder and president of Workforce Planning Associates, Inc. (WFPA). He has more than 20 years of work experience in the area of quality and organizational assessments. Berstene worked for Aetna as an education evaluator and was a commissioned officer in the U.S. Coast Guard where he was a founding member of the Leadership Development Center. Contact Berstene at tberstene@workforceplanning.com.

Fall 2010 Membership Survey

Last fall, a survey was sent to members to gain information on their satisfaction with the division and our publications. A total of 111 members (9%) responded. Sixty-five percent were satisfied or very satisfied, 30% were neutral, and only 6% were dissatisfied. The graph below shows that there was general satisfaction with our publications. In the past year, we have made a number of improvements and are looking forward to this year's survey to gauge member satisfaction. In addition, our leadership team is planning to conduct a Kano analysis (using surveys) to determine significant division activities that will enhance and increase member satisfaction. We encourage you to participate in the surveys.



Thanks to Christine Robinson for this chart and the survey analysis.

Do You Have Any Research Articles on Baldrige in Education?

Help us with our 10-year Compendium on Baldrige in Education.

Send articles to Cindy Veenstra at chair@asqedu.org or Julie Furst-Bowe at Compendium@asqedu.org

ASQ Education Division's Publications on Quality in Education

In two years, the number of ASQ publications on quality in education topics has grown in an effort to respond to the diverse needs of our members from our education sectors: K-12, higher education, and workforce development. Some of these publications are sponsored by the Education Division and some by ASQ. Except for *The Journal for Quality and Participation*, articles from these publications are available in our [online library](#).

The table below summarizes the various publications.

QED News, the division newsletter, provides information to members on our activities and includes contributed articles on interesting topics related to quality in education. All articles are contributed by division members.

The newest addition to our publications is the division-launched tri-annual *Workforce Development Brief* for members interested in workforce development. This publication includes two series, one on the basics of adult learning theory and instructional design and the other on the framework for the field of workforce development. In the latter series, the current issue discusses workforce development and globalization. If you have an article that describes instructional design or delivery, adult learning theory, or other education topics related to workforce development, please submit it to Deborah Hopen (debhopen@nventure.com). Articles should be 1,000–2,000 words and should be accompanied by a brief biography (75-100 words).

The purpose of *Quality Approaches in Higher Education*, the new

peer-reviewed online publication, is to engage the higher education community and division membership in a discussion of topics related to improving quality and identifying best practices in higher education and to expand the literature specific to quality in higher education topics. The journal Web page includes the latest call for articles and all the issues. The third issue will be published in the spring of 2011.

The Journal for Quality and Participation is a long-standing, peer-reviewed, combination print and online publication that focuses on the people side of quality. Each issue includes the department Educators' World, which is dedicated to quality in education.

The ASQ Primary and Secondary Education Brief and *The ASQ Higher Education Brief* feature invited articles associated with each issue's particular education-oriented theme. Themes and articles are often suggested by the division's leadership team. As a special publication, a joint issue on STEM issues is published annually in February to coincide with the celebration of Engineers' Week, since many of our ASQ members are engineers or in the engineering field.

The current issue of all these publications can be accessed from the homepage at <http://www.asq.org/edu/>. Look for the links on the right side of the Web page. We encourage you to tell us more about your activities and what you are doing to enhance quality at your institutions. An exchange of ideas, via published articles, helps us to further your research and get your ideas out into our learning communities so that we can all profit from your expertise.

We welcome your participation as a contributor and reader!

Publication	Sponsor	Invited/Contributed	Peer-reviewed	Frequency	Editors
QED News	Division	Contributed by division members	No	Bi-annual	Marianne Di Pierro
Workforce Development Brief	Division	Contributed and invited	No	Tri-annual	Deborah Hopen
Quality Approaches in Higher Education	Division	Contributed	Yes	Bi-annual	Deborah Hopen
ASQ Primary and Secondary Education Brief	ASQ Marketing	Invited	No	Six issues per year	Nicole Adrian
ASQ Higher Education Brief	ASQ Marketing	Invited	No	Six issues per year	Nicole Adrian/ Marianne Di Pierro
The Journal for Quality and Participation, "Educators' World" Department	ASQ	Contributed	Yes	Quarterly	Deborah Hopen

Business Plan Performance

The Education Division exceeded most of the goals established in its business plan for this past year. There were more publications, more conference sessions, more collaboration with other organizations, and participation by members this year!

Objective/Goal	Status	Goal Performance
Increase Impact: Support global transformation initiative At least one activity	Committee formed 10/1/10 Participation in INQAAHE Conference in Spain (Padró) Two articles in <i>QAHE</i> written by authors from Australia (Nov. and June issues)	Exceed goal
Increase Impact: Support social responsibility movement With one article	One SR article published in <i>QED News</i>	Goal achieved
Grow Membership: Increase the number of division members by 10%	Membership increased by 2%	Goal not met
Grow Membership: Explore partnerships with at least three other organizations interested in quality	Explored collaboration with Statistics and QMD Divisions AIR, ASHE, NCCI Co-sponsored conference with UW-Stout	Exceeded goal
Grow Membership: Increase broadcast e-mails to six Increase Website volume	16 broadcast e-mails sent to members 1,397 accesses in June 2011	Exceeded goal 16/6 = 267% of goal Accesses to website is 175% of goal
Grow Membership: Increase the number of division members engaged in activities by 10%	More participation by members	Exceeded goal
Increase Customer Loyalty: Increase involvement in STEM activities	Plan approved in Dec.—STEM Conference Feb., published special Brief on STEM Planning for STEM Conference	Goal achieved
Increase Customer Loyalty: Expand the presence of <i>Quality Approaches in Higher Education</i>	Two issues Aug 10 and June 11	Goal achieved
Increase Customer Loyalty: Expand division activities related to workforce development	Three issues of <i>Workforce Development Brief</i> this year Started two Webinars	Goal achieved
Increase Customer Loyalty: Increase proposals to World Conference to four	Nine submitted for WCQI and ICQI, five accepted and presented	Exceeded goal 9/4 = 225%
Process Performance: Use available technology to enable information sharing –create two discussion boards	Create two ASQ discussion boards, one LinkedIn and Twitter.	Exceeded goal
People: Conduct survey to measure division member satisfaction	Baseline satisfaction level established in Fall 2011. Second survey planned for late 2011.	Continuing effort
People: Increase the number of member leaders participating in leadership training	Sent leader to November DAC meeting and two leaders to the WQCI leadership training. Goal of one at each.	Goal achieved

Membership Update

Membership by Industry Type

Did you know that 22% of our 1,400 members are in organizations outside the United States? We have compiled some additional demographic information for the Education Division by industry that you may find informative. Our growth in membership was 2% in the past year and we see more growth in the next year.

This analysis is based on the industry that a member enters as most relevant. Often two or three industry/market categories may be appropriate, so some educators may have indicated the service industry was the most appropriate market, accounting for the large percent for service industry. Of the members who identified themselves as part of an “education” organization, 218 (59%) were in K-12 settings and 150 (41%) were in higher education (including international organizations). As we have a large number of members who identify both with manufacturing and education, we have the opportunity for good networking for improving the transition of college majors to manufacturing careers and outreach efforts to our schools and colleges from our members in manufacturing companies. There were also a number of “other or unknown” (115) in the demographic data for the overall member group. If you have not done so in the last year, you may want to consider visiting, reviewing, and updating your “industry/market” and other demographic information. Select the “My Account” tab on the main asq.org page and then “My Contact Information.”



Expanding Student Membership (Calling all Current Students Members)

The leadership team wants to attract more graduate students to our division and also provide an opportunity for them to network on quality in education approaches and improving educational processes. We plan to hold a teleconference for current student members on Tuesday, October 18 in the early evening. This call will be centered on your experiences as a student member and ways in which we could enhance the value of membership for both you and other new student members in the future. To participate, please contact our membership chair, Rob Robinson at rrrobbins@gmail.com.



Madame Marie Curie

Madame Marie Curie— An Early Innovator

Maria Skłodowska-Curie (1867-1934), a Polish-French scientist, established her career as a pioneering researcher in the fields of physics and chemistry. Madame Curie was the first person to win two Nobel Prizes and the only woman to win in multiple scientific fields.

She shared her 1903 Nobel Prize in Physics with her husband, Pierre Curie, and with Henri Becquerel for the discovery of radioactivity. She was sole winner of the 1911 Nobel Prize in Chemistry for her scientific work in isolating pure radium. Madame Curie, the first woman professor at the University of Paris, is one of only four individuals in the world who have been awarded two Nobel Prizes.

Report on the WCQI/ICQI Workshop: STEM Education Changing the Direction

by Cindy P. Veenstra, Ph.D.

At the 2011 World Conference on Quality and Improvement, the Education Division led a workshop on STEM education. The workshop, “STEM Education: Changing the Direction,” was part of the Institute for Continual Quality Improvement activities. After a brief overview on STEM education by Cindy Veenstra and Julie Furst-Bowe, we proceeded with two rounds of engaging table discussions. This article will summarize some of these discussions. The discussion leaders and their topics were as follows:

John Dew	Helping STEM Grads Transition to the Workplace
Julie Furst-Bowe	Baldrige Framework and STEM Education
Kenneth Getkin	Improving K-12 STEM Education
Jami Kovach	Improving College STEM Teaching/Learning
Judy and Jo Pauley	Motivating K-16 Students on STEM Careers
Cindy Veenstra	Women and Minorities in Engineering/Technology

Quality engineering/technology is a subject within STEM (science, technology, engineering, and math) disciplines, so most ASQ members will be interested in improving STEM education for current students and the next generation of quality professionals. Research shows that a strong STEM workforce contributes to economic growth.

We discussed that there is less interest in STEM college majors in the U.S. than in many other countries, and that preparation of U.S. students in math and science is much less than it should be. Some new ideas generated included: introducing engineering content in the K-12 curriculum, creating STEM high schools, and looking at the National Academy of Engineering’s focus on changing the way we talk with our youth (see www.engineeringmessages.org).

Some participants thought we should have more parental involvement. In some cultures, parents do not expect their children to go to college, but with rising employment requirements to include some college, this expectation needs to change. In some cases, parents who are not knowledgeable about the benefits of science and engineering careers may not know how to

encourage their students down this path. Yet, some participants commented that parental support in some cultures is quite strong. The conclusion was that more effort is needed to involve parents.

Teachers need to be compensated for their expertise, and we need more teachers with bachelor’s degrees in science and math teaching these courses in our school systems. Often our youth may decide by age 11 if they are interested in science or engineering careers. We, therefore, need more outreach programs, extracurricular activities, and learning games from elementary through high school.

There was much discussion on improving college teaching and learning. There is a need for more active and hands-on learning in the STEM field, co-op and experiential learning, and STEM learning communities. We need to capitalize on students’ interest in “green” and sustainability. Very importantly, we need to have an attitude of helping students succeed versus “weeding them out.” A suggestion was made to use technology more to actively engage students. For online courses, better designs for engaging students are needed. All this will lead to a more engaging climate and improved STEM retention. Special attention was given to the role of the community colleges in providing more to STEM workers, both in graduating associate degree technicians and enabling community college graduates to transfer to four-year STEM programs.

The media promotes entertainment and sports; we need a similar focus on STEM education. We need to attract more women to engineering and the physical sciences and more minorities to all STEM programs; they bring diversity of ideas for innovation. Systems thinking, such as the Baldrige Education Criteria, leads to improvement in K-12 school achievement and college-wide STEM efforts.

ASQ members can help in several ways. We can volunteer to help connect students with STEM careers by volunteering for F.I.R.S.T., science fairs, career days, and summer programs at colleges. We can talk to our neighbors about pathways to STEM careers for our children. As parents, ASQ members can help improve schools and colleges by promoting continuous improvement of STEM teaching, where their personal lives connect with schools and universities. Through an ASQ section, we can establish an outreach program to a school or college.

Many thanks to the workshop leaders who led us in energizing and informative conversations! As you read these suggestions, you can tell that we had much sharing of ideas and networking on improving STEM education. While some of these ideas are specific to STEM education, many are to applicable all fields of education. We hope to have similar division-sponsored workshops on other topics in the future.

Deborah Hopen Granted the ASQ Simon Collier Quality Award

by Marianne Di Pierro, Ph.D.



Deborah Hopen has been awarded the Simon Collier Quality Award, which will be bestowed upon her in November. The Collier Award is given “To honor, encourage, and specifically identify outstanding individual or group leadership, accomplishment and ingenuity in organizing, promoting, operating or improving quality systems and programs in industry, government, education, business,

healthcare of service organizations, which fit the professional objectives of ASQ.” Her award citation reads as follows: *Deborah Hopen has been a leader and innovator in ASQ and the quality profession for over 30 years. She has worked as a practitioner, consultant, teacher, and mentor, introducing the concepts and practices of quality to organizations and individuals, helping them to improve performance and customer satisfaction.*

Hopen has more than 30 years of experience in total quality management. She has served as a senior executive with both *Fortune* and *Inc* 500 companies. Her varied experience includes time spent in general management, quality assurance and quality control, training, human resources, organization development, research and development, process engineering, and accounting.

From July 1995 through June 1997, she served as president and chairman of the American Society for Quality. She also has served as president of the Washington State Quality Award Program and the International Standards Initiative, as well as being involved as a

leader with numerous Washington state cultural and charitable organizations. Hopen is a Fellow of ASQ and is the editor of ASQ’s *Journal for Quality and Participation*.

In addition to being the author of more than 100 publications and presentations, she has taught statistical process control, quality management, production management, and production costing at the university level. She has a B.S. in applied science with advanced studies in business administration, industrial and clinical psychology, and operations research. She was a Certified Quality Engineer for over 15 years and is recognized as a Lean Six Sigma Master Black Belt. Her consulting list includes clients from the manufacturing, service, military, government, education, and not-for-profit sectors.

Simon Collier, a founding member of ASQ, was the first Edwards Medal awardee, an honor acknowledging spirited dedication and commitment. He was elected in 1965 as the fourth Honorary Member of ASQ, and was a pioneer in forming the ASQ infrastructure, increasing membership, forming various divisions, and cultivating senior leadership positions within the Society. Collier fostered close relationships with the membership and developed key professional relationships. He was a trained chemist and authored and co-authored numerous publications. Collier was a proponent of quality control methods in industry and produced a seminal quality training film that has been used nationally.

The Simon Collier Award to Deborah Hopen honors her remarkable career trajectory and acknowledges her leadership, expertise, and professionalism in cultivating processes that hold human advancement as a central focus.

The Education Division Officers and Committee Chairs

We Welcome Your E-mail!

Chair

Cindy Veenstra
Engineering Education Consultant
Veenstra and Associates
cpveenst@umich.edu

Chair-elect

Fernando F. Padró
Interim Director, Education Leadership,
Cambridge College
fpadro@msn.com

Secretary

Teri Reed-Rhoads
Assistant Dean of Engineering for
Undergraduate Education,
Purdue University
trhoads@purdue.edu

Treasurer and Community Colleges Chair

Ted Mattis
Quality Systems Manager for Woodward
Governor's Turbine Combustion System
Ted.Mattis@woodward.com

K-12 Quality Systems Chair

J. Jay Marino
Superintendent of Schools, Dunlap
Community Unit School District 323
(Illinois)
jmarino@dunlapcusd.net

K-12 Classroom Tools Chair

Becky Martin
Continuous Improvement Facilitator,
Cedar Rapids Community School District
(Iowa)
martin@cr.k12.ia.us

Higher Education Quality Systems Chair

Julie A. Furst-Bowe
Provost and Vice Chancellor for Academic
and Student Affairs, University of
Wisconsin-Stout
Furst-bowej@uwstout.edu

Workforce Development Chair

Tom Berstene
Workforce Planning Associates, Inc.
tberstene@workforceplanning.com

QED News Editor

Marianne Di Pierro
Director, Graduate Center for Research
and Retention, Western Michigan
University
marianne.dipierro@wmich.edu

Website Liaison and Membership Chair

Rob Robinson
Operations Manager, Quality and
Technical Assistance Group, ResCare
Workforce Services
rrobobins@gmail.com

Financial Audit Chair

John Dew
Vice Chancellor, Troy University
jrdew@troy.edu

Editor, *Quality Approaches in Higher Education and Workforce Development Brief*

Deborah Hopen
Deborah Hopen Associates, Inc.
debhopen@nventure.com

Examining Chair

Don Brecken
Instructor Business Program and Advisor,
Ferris State University
www.ferris.edu/statewide

Standards Representative

F. Craig Johnson
Chair, ASQ Standards Committee
fcjohnson@fsu.edu

Shaping the Future Through Quality in Education and Professional Development