



# American Society for Engineering Education Industrial Engineering Division Newsletter

FALL 2011

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## FINAL CALL FOR PAPERS – 2012 ASEE ANNUAL CONFERENCE

By now you should have received reminders about the deadline for abstract submissions to the ASEE Annual Conference in San Antonio, Texas, June 10-13, 2012. This is a final encouragement to submit an abstract to the IED by *this Friday: **October 7, 2011***. We have a goal of offering 15 excellent papers at the conference and you can help us meet that goal by presenting your best work related to IE education.

Relevant submissions are welcome from all engineering disciplines. Abstract considerations include all levels of innovation, technical merit, demonstrated outcomes and relevance to industrial engineering education. The IED is a publish-to-present division. Both abstracts and papers must be accepted to present. Submissions must include content related to educational issues.

*Only papers submitted to the IED, and presented at the conference are eligible for the Division's Best Paper Award, or New Industrial Engineering Educator Outstanding Paper Award.*

Abstract submission is open. All abstracts must be loaded electronically through the ASEE paper management system by **October 07, 2011**.

Authors of accepted abstracts will be invited to submit full-length papers for peer review, and all accepted papers will be considered for appropriate award recognition. Manuscript reviews include accuracy, completeness, readability and rigor of presentation. If your abstracts are accepted, draft papers are due on **January 06, 2012**.

Additional information, including the Author's Kit with deadlines and instructions, will be available via the ASEE website (<http://www.asee.org/conferences-and-events/conferences/annual-conference/2012/program-schedule/call-for-papers>).

If you have any questions, please contact the IED Program Chair, Lesley Strawderman at: [strawderman@ise.msstate.edu](mailto:strawderman@ise.msstate.edu) or (662) 325-7214.

## IED 2011 ANNUAL CONFERENCE TECHNICAL SESSIONS

The IED sponsored two sessions at the 2011 Annual conference in Vancouver. Nine papers were presented in those sessions. The topics were wide-ranging and included such diverse topics as using FarmVille to teach operations research, developing multidisciplinary courses in sustainability, and managing capstone design projects. The papers are identified below along with an abbreviated version of the original abstracts. The full papers are available through <http://www.asee.org/search/proceedings>.

### ***Design Projects with Out-of-Town Companies***

Lizabeth T. Schlemer (California Polytechnic State University, San Luis Obispo)

**This paper was the recipient of the *Best Paper Award* in the IED at the conference.**

Abbreviated Abstract: The capstone design class in the industrial engineering department at California Polytechnic State University, San Luis Obispo (Cal Poly) includes projects with companies. The projects are large ambiguous facilities design problems that allow students to incorporate many aspects of the IE curriculum. For the past 15 years students have been participating in these projects with local companies. Over the past several years, companies from out of town (200 miles to the north in Mountain View or 200 miles to the south in Oxnard) have participated. These out of town companies have presented certain logistical issues, but they have proven to be quite beneficial to the students, the program, and the companies. This paper will discuss lessons learned and illustrate through student assessment the benefits of these activities.

### ***Using Social Networking Games to Teach Operations Research and Management Science Fundamental Concepts***

Ivan G. Guardiola (Missouri University of Science & Technology), Susan L. Murray (Missouri University of Science & Technology), and Elizabeth A. Cudney (Missouri University of Science & Technology)

Abbreviated Abstract: This paper presents our experience using the popular game FarmVille by Zynga® to teach the fundamentals of linear programming and integer programming concepts to undergraduate students in an introductory operations research course. A month-long contest was introduced amongst the students with the goal to be the best individual farmer by striving to reach high levels of revenue, experience, and aesthetic appeal of their own unique farm. The contest is to demonstrate the concepts of problem formulation, solution methods, multiple and competing objectives, implementation of policy, and reformulation.

### ***Enhancing Undergraduate Engineering Education of Lean Methods using Simulation Learning Modules within a Virtual Environment***

Elizabeth A. Cudney (Missouri University of Science & Technology), Steven Michael Corns (Missouri University of Science & Technology), Jennifer A. Farris (Texas Tech University), Stephen Gent (South Dakota State University), Dr. Scott E. Grasman (Rochester Institute of Technology (COE)), and Dr. Ivan G. Guardiola (Missouri University of Science & Technology)

Abbreviated Abstract: This paper highlights the use of an integrated user-centered virtual learning environment through extensible simulation learning modules that is currently being developed to enhance undergraduate curricula to meet the industrial needs for engineers with education in lean. The purpose of the research is to address these expectations by developing learning modules that incorporate lean simulation models into various Engineering Management, Industrial Engineering, and Mechanical Engineering courses at Missouri S&T, Texas Tech, and South Dakota State, respectively. The paper highlights the learning modules to be developed in the virtual learning environment. The long-term goal is to evaluate the impact of the curriculum changes on student learning, outreach, and industrial collaboration.

### ***Use of Buzzwords in Industrial Engineering Education***

Abhijit Gosavi (Missouri University of Science & Technology) and Jane M. Fraser (Colorado State University, Pueblo)

Abbreviated Abstract: Buzzwords or buzz phrases have been used in the content of numerous industrial engineering courses for several years now. Buzzwords have a finite life, which can last from five to ten years or even more. The use of buzzwords in teaching raises numerous questions. Are buzzwords unique to our profession, i.e., industrial engineering? Does a new buzzword in industrial engineering fundamentally alter the content of what we teach or should teach in our courses? In this paper, we will first attempt to answer questions such as the ones posed above. In particular, we will characterize the roots and origins of several buzzwords that are being used or have been used in industrial engineering. Thereafter, we will study whether their use has impacted industrial engineering education. Finally, we will attempt to determine whether buzzwords confuse students or help them gain a clear vision of industrial engineering.

### ***Integration of Systems Engineering Training Modules into Capstone Courses across College of Engineering Departments***

Dean Walton Pichette (Wayne State University), R. Darin Ellis (Wayne State University), Dr. Walter Bryzik (Mechanical Engineering, Wayne State University), Dr. Kyoung-Yun Kim (Wayne State University), Dr. Ming-Chia D. Lai (Wayne State University), and Dr. Yun Seon Kim (Wayne State University)

Abbreviated Abstract: The Department of Defense (DoD) has identified the promotion of Systems Engineering (SE) knowledge and career path awareness for undergraduate engineering students as a key strategic initiative. Wayne State University decided on a novel approach to achieving this objective by introducing SE training modules into existing capstone courses across both the Industrial and Systems Engineering and Mechanical Engineering departments. Instructors of the courses collaborated to approach a DoD-relevant design problem, i.e. development of humanitarian assistance/disaster relief kit elements, from multiple perspectives. Beyond the Department of Defense objectives, these training modules are being used as a method of achieving continuous improvement in the capstone courses. The first module is an introduction to systems engineering while other modules relate to systems engineering tools that are taught "just-in-time" to support completion of the capstone design projects.

### ***Learning Improvement in Leadership, Teamwork, and Contemporary Issues through a Global Supply Chain Project***

K. Jo Min (Iowa State University) and Wenbo Shi (Iowa State University)

Abbreviated Abstract: In this paper, we describe a learning improvement initiative centered on a production systems course project. This initiative addresses strategic production planning of a hypothetical global supply chain with contemporary environmental and energy consequences. The quantitative problems of this project are to be formulated and solved by student teams where each team member assumes a unique position of responsibility. Given specific responsibilities for each managerial position in solving a series of quantitative problems where the leadership of each project team rotates among teammates, students are not only able to produce multi-disciplinary solutions to this global supply chain company, but also able to demonstrate their leadership and teamwork skills. The progress made thus far in terms of input, process, and output including team organization and management will be presented. Also, challenges in this project will be identified, and future direction will be discussed.

***Building Expertise on Energy Sustainability (BEES): An Integrative Model to Increase Research and Education in Energy Sustainability***

Jose F. Espiritu (University of Texas, El Paso) and Heidi A. Taboada (University of Texas, El Paso)

Abbreviated Abstract: This paper describes a model called "***Building Expertise on Energy Sustainability (BEES)***" to increase research and education in Renewable Energy Systems within an existing industrial engineering program. The *BEES* model is a comprehensive approach composed of four key components, which are: 1) Education, 2) Research, 3) Outreach, and 4) Connection. Each component consists of a set of structured activities to help increase education and research in renewable energy systems. For the *education* component, a systems approach for curriculum development is used. In the *research* component, a *Pair-2-learn (PAL) model* is used to form teams of undergraduate and graduate students to work in specific research projects. In the *outreach* component, different lesson plans are developed for high school teachers participating in the UTeach Miners program. The main goal in the *connection* component is to build stronger connections among different institutions; therefore guest speakers are invited to come to our University. Formative and summative evaluations are used to assess the objectives of the *BEES*.

***Experiences While Incorporating Sustainability Engineering into the Industrial Engineering Curricula***

Heidi A. Taboada (University of Texas, El Paso), Jose F. Espiritu (University of Texas, El Paso), Abril Vazquez (University of Texas, El Paso), and Olivia C. Moreno (University of Texas, El Paso)

Abbreviated Abstract: The main objective of this paper is to present the approach used to integrate sustainability engineering content into the engineering curriculum at our University. The approach involves offering a multidisciplinary class in sustainability engineering which was offered to junior or senior engineering students as a technical elective class with no prerequisites. The class was divided in four main modules which are Life Cycle Assessment, Energy Management, Design for Sustainability, and Ethical Consumerism. A team teaching approach was used to teach the class with faculty members from the departments of Mechanical Engineering and Industrial, Manufacturing and Systems Engineering Department. In the class, students were required to work in teams to solve two different projects. Finally, the course was evaluated using student questionnaires and exit interviews and an survey was sent to the students six months after they took the class to collect data and assess student learning.

***Transformational Leadership 101: What All Industrial Engineering Graduates Should Know about the Six Stages of Quality Management System Implementation***

Phillip R. Rosenkrantz (California State Polytechnic University, Pomona)

Abbreviated Abstract: A convenience sample of 306 executives in the American automobile industry was surveyed to assess their awareness and use of 17 quality tools and statistical methodologies. The results produced some unexpected findings that help in understanding the differences between traditional hierarchal (transactional) management cultures vs. the more modern learning organization (transformational) corporate cultures. One of these findings was that Hayes' *six stages of quality system implementation* is an excellent framework for understanding, planning and implementing lean, six sigma, statistical process control, and other continuous improvement methodologies, tools, and leadership models. To incorporate these findings and implications, three core courses in the industrial and manufacturing engineering curriculum were restructured. The results also have major implications for lifelong learning for engineers and are compatible with the teachings of others such as Taylor, Deming, Senge, and a study by Ernst & Young.

## IED 2011 ANNUAL CONFERENCE BUSINESS MEETING SUMMARY

The annual business meeting of the IED was held at 12:30 on Wednesday, June 29, 2011. Meetings are always held over lunch on the final day of the conference and are usually preceded, and succeeded, by IED, Engineering Economics Division, or Systems Engineering Divisions sessions. Please include this meeting in plans for the 2012 Annual Conference in San Antonio.

Sixteen members of the Division attended the meeting which was led by outgoing Chair Lawrence Whitman. After the members in attendance introduced themselves, Larry began by noting that there are currently 240 IED members, 20 fewer than in 2010. IED now comprises 2% of all ASEE members.

### PIC Report – Larry Whitman

Larry presented the report on behalf of Stephanie Adams who serves as the Professional Interest Council (PIC) rep for the divisions closely aligned with IED. The highlights of the presentation were:

#### *ASEE Membership Statistics:*

13063 Professional Members  
8700 Professional Members  
796 Student Members

#### *Conference Statistics:*

2916 Abstracts submitted  
2687 Abstracts accepted  
1971 Papers submitted  
1720 Papers accepted  
1717 Published

Larry noted that because of the large number of paper presentations, the number of sessions at the conference is tightly controlled and the allocation process is not conducive to giving more sessions to add divisions.

Consequently, it's important to use the sessions we have effectively. He also noted that future conferences will include special sessions with the five "best PIC" papers from the previous year.

ASEE has created a special \$3,000 fund to support special projects to benefit the divisions. Each project can cost up to \$500. An IED mentor/graduate dinner was cited as one project that could receive funding. Anyone having ideas for special projects that could enhance the IED is encouraged to contact one of the IED Board members.

### Program Chair Report – Abhijit Gosavi

Eighteen abstract submissions for the 2011 conference were received and all were accepted. Fifteen papers were submitted for review. Fourteen were accepted. Five authors withdrew their papers. Nine papers were presented in two sessions. Abstract submissions were down from 30 in 2010. It was noted that there were the IED had four sessions allocated, and that two were cancelled because there weren't enough papers submitted to fill the sessions.

Suggestions for improving the IED sessions were solicited during the PIC Report and the Program Chair Report. Most of the discussions were centered on the possibility of having a panel discussion, or having a distinguished speaker present on a topic of interest to the IED. Among the topics suggested were:

- Software technology.
- Technology that engages IE students.
- Sustainability in the IE curriculum.
- Direction of the future of IE and IE education.
- How IEs can take a leadership role in working with other departments to develop courses, cases, etc.
- Tutorials.
- Special session featuring NSF Grantees related to ISYE education
- Best practices in industry/university interaction.

## Financial Report – Rick Olson

Expenses from the Louisville meeting to the Vancouver meeting included \$250 for awards and \$87.05 for expenses related to the Louisville meeting. As of the Vancouver meeting, the balances of the IED accounts are:

Ending BASS account balance = \$19,429.97

Operating account balance = \$257.00

## Old Business

*Bylaw Changes Approved* - The changes in the new IED Bylaws approved at the 2010 meeting have been accepted by ASEE. The most significant changes include the addition of four rotating directors to the division officers, and the funding of awards for Distinguished Service, Lifetime Achievement, and New Industrial Engineering Educator Outstanding Paper. Only the *Best Paper* award was presented at the 2011 Conference because no nominations for the other awards were received. The *Best Paper* award was given to Lizabeth Schlemmer of Cal-Poly San Luis Obispo for the paper, *"Design Projects with Out-of-Town Companies."*

*Website Update* - The IED web site is now at <http://ied.asee.org/>. Minutes, division news and Bylaws are at that site.

## New Business

Larry led a discussion of goals for the upcoming year. Many suggestions were offered and discussed and the following measurable goals were adopted by the Division:

- Increasing IED membership to at least 260 members.
- Identify a minimum of two qualified nominees for each award.
- Increase the number of IED papers presented at 2012 Annual Conference to 15.
- Delivery of two newsletters to members: one in the Fall, and one in the Spring.
- Either a panel discussion or a distinguished lecture session at the 2012 Annual Conference.

## Installation of New Officers

Because the Bylaws provide for orderly transition of officers, only a new Secretary/Treasurer needed to be elected. Heidi Taboada was nominated by Larry and elected by acclamation. The current IED board is:

Division Chair:	Abhijit Gosavi
Program Chair:	Lesley Strawderman
Program Chair-Elect:	Rick Olson
Secretary/Treasurer:	Heidi Taboada
Awards/Past Division Chair:	Lawrence Whitman
PIC Chair:	Stephanie Adams
Directors:	Jane Fraser (through 2012) Jessica Matson (through 2013) Kim LaScola Needy (through 2013) Terri Lynch-Caris (through 2012)
Newsletter Editor:	Rick Olson
Webmaster:	Lawrence Whitman

## IED AWARD CRITERIA

With the approval of new Division Bylaws, there are now four awards offered by the division to recognize excellent papers presented at the ASEE Annual Conference and acknowledge outstanding service on behalf of the division. Please be aware of the paper awards as you review submissions for the Annual Conference, and note the qualifications for the Outstanding Service and Lifetime Achievement award so that you can nominate your well-qualified colleagues.

### **Best Paper Award**

The purpose of this award is to encourage and recognize industrial engineering educators for the preparation and presentation of outstanding papers at sessions sponsored by the IE Division during the ASEE Annual Conference. The award consists of a plaque of recognition for first place, and a letter of recognition for second place (runner-up).

Qualifications and Eligibility Requirements: To be eligible, papers should be presented at sessions sponsored by the IE Division and be accepted for publication in the conference proceedings. Selection among individual or team nominees will be primarily based upon the quality of the written paper and its relevance to IE education.

Nominations: Announcement of the award competition will be included in the call for papers for the IE Division. Papers eligible for this award must be peer reviewed and recommendations for consideration be submitted by reviewers or review coordinator (Program Chair). Special Nomination Instructions: The Award Selection Committee will select an award winner and a runner-up. The award winner will be automatically nominated for competition for PIC I Best Paper Award. In the event that the IE Division nominee shall receive the PIC I Award, the runner-up would be selected for the IE Best Paper Award.

### **New Industrial Engineering Educator Outstanding Paper Award**

The purpose of the award is to encourage and recognize new industrial engineering educators for the preparation and presentation of outstanding papers at sessions sponsored by the IE Division during the ASEE Annual Conference. The recipient will be awarded \$250 per author up to \$500 per paper. Senior faculty are eligible for the award as co-authors, but not for the monetary award. The award also includes a plaque of recognition.

Qualifications and Eligibility Requirements: Papers should be submitted and presented by tenure-track faculty or faculty having less than seven years of full-time teaching experience. The paper should be presented at a session organized by the IE Division, and be accepted for publication in the conference proceedings. Selection among individual or team nominees will be primarily based upon the quality of the written paper and its relevance to IE education.

Nominations: Announcement of the award will be included in the call for papers for the IE Division. Questions regarding eligibility will be sent to any author whose abstract is accepted for presentation during the ASEE conference. Papers eligible for this award must be peer reviewed and recommendations for consideration be submitted by reviewers or review coordinator (Program Chair).

### **Distinguished Service Award**

This award recognizes exemplary service to the Industrial Engineering Division and is presented to a member of the division who has provided significant service to the division. The award consists of an engraved plaque and can be received only once by any individual.

Award Criteria: While service as an officer in the division will be a common trait of recipients of this award, it is not routinely awarded to outgoing officers. Selection for this award will be based on:

- Current and continuing active membership in the Industrial Engineering Division. Exemplars of this would include (1) presenting papers at the annual conference, (2) attendance at the annual business meeting, and (3) participation in the annual banquet at the annual conference.
- Exemplary service to the Industrial Engineering Division over an extended period of time. Service to the division, both before and after service as an officer in the division, is required. Exemplars would be (1) service elsewhere in ASEE as a representative of the division, and/or (2) service to the division directly or indirectly.

### **Lifetime Achievement Award**

This award recognizes an outstanding industrial engineering educator in recognition of the educator's contributions to the profession. The award, which recognizes lifetime achievement in industrial engineering education, is presented annually to an individual who has made significant contributions over an extended period of time to the discipline and the division, and who exemplifies the highest standards of the professorate in industrial engineering. The award consists of a suitably engraved plaque presented at the annual Joint IE/EMD/EED Division Dinner. The award can be received only once by any individual.

Award Criteria:

Current or past membership in the industrial engineering professorate, which is defined for this award as teaching in a university program that offers one or more degrees in industrial engineering.

- Exemplary service to the industrial engineering discipline. Exemplars would be (1) service as a chair, head, or program director of a major industrial engineering program; (2) service as editor, associate editor, reviewer of a peer-reviewed publication in the discipline; or (3) a national reputation for promoting the academic discipline of industrial engineering.
- Exemplary service to the Industrial Engineering Division of ASEE. Exemplars would be (1) service in a leadership role in ASEE or the Division, (2) active support of Division programs and initiatives, (3) service to the professorate in industrial engineering, and/or (4) service to the students in industrial engineering programs.
- A national reputation in industrial engineering through service to the practice of industrial engineering. Exemplars of this would be (1) membership and office in a relevant industrial engineering professional organization, (2) a publication record promoting industrial engineering practice, or (3) other service to industrial engineering practitioners.

## **HOW CAN YOU HELP THE IED?**

As is the case with every Division in ASEE, the success of the IED depends on the participation of its members. As mentioned earlier in this newsletter, the members attending the business session in Vancouver identified a series of goals for the upcoming year. We are hoping you can help us to achieve these goals in specific ways:

- Make certain you renew your IED membership.  
The Division's goal is to increasing IED membership to at least 260 members by the 2012 Conference. As you renew your ASEE membership this year, make certain that you check the box for the IED. The nominal dues provide the money needed to appropriately recognize the award recipients, but even more importantly, your membership in the IED sends a signal to ASEE that the Division is important and deserving on continuing to receive four technical paper sessions at the conference.
- Make a special effort to encourage your colleagues to join ASEE, and the IED.
- Submit a paper to the Annual Conference



To increase the number of IED papers presented at 2012 Annual Conference to 15, we need high quality papers to be delivered at the sessions. The deadline for abstract submissions is only a few days away, so time is running out, but sharing your experiences and insights through a paper and the technical session benefits all IED members, and their students.

- Volunteer to review abstracts and papers submitted to the IED.  
Everyone appreciates a thorough review of the papers they submit. Those reviews have to start somewhere. By offering a few hours of your time, you'll help to improve the quality of the IED program even if you aren't able to attend the conference. Contact Lesley Strawderman ([strawderman@ise.msstate.edu](mailto:strawderman@ise.msstate.edu)) for information about how to volunteer to review.
- Identify a deserving recipient for IED awards.  
Outstanding papers don't receive the recognition they deserve unless the reviewers are aware of the awards, and then identify the best papers for the awards. When reviewing papers, keep an eye out for outstanding work. At the same time, review the criteria for the Distinguished Service and Lifetime Achievement awards. If you can identify deserving colleagues, please tell the Division leadership.
- Attend IED sessions at the Annual Conference, and rate the sessions.  
Among the factors that ASEE uses when allocating technical sessions are the attendance at the session and the evaluations of the quality of the sessions. Come to the IED Business meeting and share your good ideas. By attending the sessions you will ensure the IED's place at future conferences; and you'll become a better IE educator.
- Represent IE at Regional ASEE Conferences  
Regional conferences often offer forum for your work that is close to home and may be more convenient for you than the National Conference. Keep your eyes out for the Call for Papers from your local section and submit paper there. This may also prove to be an opportunity to find a future collaborator.
- Share your ideas with the board.  
We're always looking for new ideas that can make the IED more valuable for the members. Your ideas are as good as anyone else's. Please share them with the board. If you don't know how to contact us, keep reading.

## IED BOARD MEMBER CONTACT INFORMATION

Division Chair:	Abhijit Gosavi ( <a href="mailto:gosavia@mst.edu">gosavia@mst.edu</a> ) (573)341-4624
Program Chair:	Lesley Strawderman ( <a href="mailto:strawderman@ise.msstate.edu">strawderman@ise.msstate.edu</a> ) (662) 325-7214
Program Chair-Elect:	Rick Olson ( <a href="mailto:r_olson@sandiego.edu">r_olson@sandiego.edu</a> ) (619) 260-6853
Secretary/Treasurer:	Heidi Taboada ( <a href="mailto:hataboada@utep.edu">hataboada@utep.edu</a> ) (915) 747-5734
Awards/Past Division Chair:	Lawrence Whitman ( <a href="mailto:larry.whitman@wichita.edu">larry.whitman@wichita.edu</a> ) (316) 978-5907
Directors:	Jane Fraser ( <a href="mailto:Jane.Fraser@colostate-pueblo.edu">Jane.Fraser@colostate-pueblo.edu</a> ) (719) 549-2036 Jessica Matson ( <a href="mailto:matson@tntech.edu">matson@tntech.edu</a> ) (931) 372-3260 Kim LaScola Needy ( <a href="mailto:kneedy@uark.edu">kneedy@uark.edu</a> ) (479) 575-6029 Terri Lynch-Caris ( <a href="mailto:tlynch@kettering.edu">tlynch@kettering.edu</a> ) (810) 762-9859
Newsletter Editor:	Rick Olson
Webmaster:	Lawrence Whitman