

the KERN FAMILY FOUNDATION

keen
Kern Entrepreneurship Education Network

THE HOWL



Newsletter Overview

Recently, Nassif Rayess of the University of Detroit – Mercy sent the gift of a textbook to the Foundation House. It was entitled *Ackoff's Best: His Classic Writings on Management* by Russel L. Ackoff. With it Nassif sent this message, "I believe that the Kern Family Foundation is way ahead of the curve with both KEEN and [project-based learning], and our association with KEEN is being continuously validated. Had I come across this book before KEEN, I would have felt depressed and helpless. Instead, I feel energized."

Ackoff, educated in philosophy and a past member of the Wharton School of Business, takes to task traditional educational pedagogy that is teacher-centric and one that is focused on the memorization of facts. His views challenge traditional teaching methods as counterproductive and inhibitors of creativity. He focuses on how much better it would be if we taught students how to ask the right questions than to find the right answers. (Hmmm, isn't that one corner of the KEEN Pyramid?) He states, "It is better to formulate the wrong answer to the right question than to formulate the right answer to the wrong question," and he gives plenty of examples to make his point. In the chapter entitled "Never Let Your Schooling Interfere with Your Education," he writes, "The quality of education provided by a school is not the sum of the qualities of the education provided by each of its departments, but the product of their interactions." It appears Nassif sees the potential the KEEN Program brings to all the KEEN schools and is the basis for his new-found energy. We see it, too!

The following edition of *The Howl* attempts to capture the energy being created as the Network of KEEN schools work together to develop interactions aimed at benefiting KEEN engineering students throughout our Network. Perhaps we're not to the fullest extent possible (yet), but we *are* doing what Ackoff challenges us to be doing in higher education. I hope you will agree with Nassif; YOU are ahead of the curve in all you are doing. Jim, Sarah, Tim and now Katie thank you all for your leadership in your KEEN work. Please help us to continue to grow the team by getting your vertical, horizontal and dense networks working in Wolf-Pack harmony.

- Timothy J. Kriewall, Ph.D.
KEEN Program Director

**Volume 2,
Issue 2**

June 2011

Inside this issue:

Dense Networks	2
New Member of	3
SEE Workshop	4
Assessment	5
BU: Inspiration Ambassadors	6
JEEN: Fall 2011 Special Issue	7
Upcoming	9

The KEEN Network Moves to Dense Networks

March 11, 2011 will go down as a watershed day in the annals of KEEN lore. That is the day that six colleges – together – requested of the Kern Family Foundation, consideration of next-level grants. Altogether, they were requesting grants the equaled nearly \$2.4 million over three years. They understood that they needed to show a synergy among them in their grant requests. The dependency was to be so clearly significant that they would all receive funding or none of them would receive funding. They each faced the challenge to articulate their dependencies and contributions to this small cluster of colleges that clearly demonstrated a unique benefit to all of their students over and above what they could do for their students individually. The whole needed to be greater than the sum of the parts.

“This grant shouldn’t be about us and our schools; it needs to be about our students.”

*Jonathan Rosen,
Boston Univ.*

Boston University, Gonzaga University, Kettering University, Lawrence Technological University, St. Louis University and Worcester Polytechnic Institute knocked the ball out of the park. Their journey began at the Fall KEEN meeting in Milwaukee when they first created their “dense” network that was voted as the best-in-class by their colleagues in attendance. They had their first real organizational meeting in Detroit on December 16th. All schools demonstrated leadership attributes at the meeting, but it was Sridhar Condoor of SLU who facilitated the meeting and drew out the best in everyone. It was Jonathan Rosen who challenged his colleagues to be sure they shared a common understanding of terms and who made an impassioned plea to have their students at the center of all they planned to do. He said, “This grant shouldn’t be about us and our schools; it needs to be about our students.” In this author’s opinion, that was the galvanizing statement of the meeting that carried the schools through the next important meeting. The Dynamic Compass Network, or DCN, was formed.

In all team formation, a team needs to go through four phases that have almost become a cliché: forming, storming, norming and performing. It is virtually impossible to get to high team performance without going through the first three phases. Although the storming phase is tumultuous and challenges the patience of the most collegial people, it is where trust, ironically, is built among the team members. The forming meeting was clearly the December meeting, and the storming meeting was at the Winter KEEN conference in Tempe. In an after-hours meeting, representatives of the six schools gathered in a separate meeting room to begin fleshing out the details of the proposals. Flashes of lightning and a few thunder claps, metaphorically, could be sensed by those outside the room, but to everyone’s credit, the DCN pulled together and created something entirely new within KEEN and perhaps in the world of higher education.

On March 11, all but one of the colleges had two representatives jointly make a presentation at the Foundation in Waukesha. All the PIs were there – Jonathan

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The KEEN Network Moves to Dense Networks *continued*

Rosen, Vladimir Labay, Doug Melton, Don Carpenter, Sridhar Condoor, and Jerry Schaufeld. In addition, the schools had strong administrative support including a provost, a vice president of academic affairs, an associate provost, a dean and an influential member of one of the school's board of trustees – an alumnus, successful business owner and pilot who flew his own plane to the meeting. Everyone present at the meeting spoke to the initiative in a most compelling way. The entire pitch took less than an hour and a half. The presenters ably answered some penetrating questions. Provost Maria Vaz of LTU kicked off the meeting with an overview and concluded the meeting with a summary in a way only Maria can do. No one could have been happier with the entire presentation than Mr. Kern, but close behind in elation was the KEEN Program Director. Wow!

P.S. The bar has now been set. From here on out, it will be increasingly difficult for schools to receive larger grants if they are not able to demonstrate alliances with other schools in the network – dense alliances. However, in developing the alliances, the students should clearly be the beneficiaries if the DCN is any example. Congratulations DCN members!

*- Timothy J. Kriewall, Ph.D.
KEEN Program Director*

New Member of the Wolf Pack

On June 1, 2011, Jim Rahn, Tim, Sarah and everyone in the Kern Family Foundation welcomed Ms. Katie Sloan to the KEEN Program as a Program Assistant and the newest member of the KEEN Team on June 1. She will be helping Sarah and Tim manage the many (growing) details of the KEEN Program so momentum will continue to grow without losing anyone or anything along the way. Her e-mail address is ksloan@kffdn.org and her Foundation phone extension is 262.968.6838 ext. 24.

Katie recently graduated magna cum laude from Wisconsin Lutheran College with a bachelor's degree in Communicative Arts. She has a special interest in developing her skills in event planning. She was born and raised in Omaha, NE. During college, she was a member of the women's soccer and softball teams and college choir. She organized a number of student-led volunteer projects. If you want to learn more about Katie from her own perspective, visit www.katielsloan.com which is a website she created as a class project while at WLC.



The SEE is Scheduled from August 7-9, 2011

A new Shaping the Entrepreneurial Engineer Workshop is planned for August 7-9. The emphasis will be on the engineering required to commercialize products. Attendance will be limited to 40, so those interested should register NOW at www.kffdn.org. Please see the end of the article for more registration details.

All ABET-accredited engineering programs require a senior capstone project. When successfully completed, the seniors can feel a real sense of accomplishment. They may even feel their product could be commercialized, however, a proof-of-concept product idea is far from ready for market launch. The engineering still required to commercialize a product may not be discussed in undergraduate engineering programs. The goal of the August SEE conference will be to introduce participants to the issues surrounding commercializing products that benefit people. The products need to be reliable, durable, manufacturable and serviceable. How does one know that a product has these attributes?

A generalized difference between a proof-of-concept prototype and a commercialized product is broadly characterized by statistical variation. Variation exists: in the components and subassemblies of a product, in the manufacturing processes, in environmental parameters, in users' behaviors, anthropometry and education and in how well the product is maintained. Will the product always perform with all these variations? The job of an engineer is to make sure it does.

The verification process attempts to test whether or not the product will meet its design specifications. In other words, "Was it designed correctly?" Additionally, even though it may meet design specifications, engineers are often surprised to learn that the specifications don't adequately describe what customers need. The process of validation is required to test the assumption that the product meets the customers' requirements. In other words, "Did the engineers design the correct product?"

The August SEE workshop will focus on some of these concepts. Faculty members that participate may expect to leave the workshop with seeing some actual product concepts that were excellent in principle but that presented challenges in practice. They will be able to better prepare engineering students with the issues surrounding a completely new product's development life cycle.

Lodging will be provided at the Olympia Resort in Oconomowoc, WI. Participants will be invited to a welcome dinner the evening of August 7th after which Ms. Dawn Tabat,

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The SEE is Scheduled from August 7-9 *continued*

COO of Generac for over 30 years, will be the keynote speaker.

On Monday morning, participants will be bussed to the Generac Manufacturing facility in Eagle, WI. Monday evening, the group will enjoy a visit to Old World Wisconsin for dinner and an opportunity to see some of Wisconsin's history. Then, back to the Olympia Resort followed by a half-day working session on Tuesday.

The group will be divided into five groups of eight. The groups will rotate through four kinesthetic work stations and a plant tour. The workshop promises to be both an insightful and enjoyable event. It will be particularly interesting for those faculty members who may not have had industrial experience.

To register on-line, please follow these instructions:

1. Go to: www.kffdn.org
2. Click on: Innovation Programs -> KEEN -> Faculty Workshop
3. Click on the provided link to register on-line.

Please contact Sarah Hanna at shanna@kffdn.org for more details regarding registration for this faculty workshop.

- Timothy J. Kriewall, Ph.D.
KEEN Program Director

KEEN - TTI Assessment Project Update

KEEN - LTU Assessment Workshop | March 31 - April 1, 2011
Lawrence Technological University (LTU) — Southfield, MI

Twenty-seven people participated in the KEEN-LTU Assessment Workshop held on the LTU campus in Southfield; all eighteen active schools were in attendance. The program focused on the following objectives: 1 – Sharing and discussing assessment methods, models and techniques, 2 – Updating and advancing the TTI – KEEN Performance DNA, 3 – Developing collaborative partnerships to work collectively on advancing assessment, 4 – Advancing how KEEN assessment can be used to improve retention and improve faculty effectiveness and 5 – Organizing a benchmarking initiative of practicing entrepreneurially minded engineers (EMEs).

The program included a series of presentations, discussions, development exercises and a session featuring a panel of five EMEs. Five teams were created to address the following topics: linkages between the KEEN-TTI Performance DNA results and ABET a-k accreditation outcomes, Methodologies, KEEN Rubrics, Demographics and Creating a Body of Knowledge. Workshop evaluations indicated that participants found significant value in the program, and they are interested in attending future as-

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KEEN - LTU Assessment Workshop *continued*

assessment workshops. The respondents support the KEEN – TTI Performance DNA Assessment Project.

The five teams will each present an update of their work at the Fall 2011 KEEN Conference.

-David Pistrui, KEEN Advisor

American Society of Engineering Educators (ASEE) | 18th Annual Conference | June 26 - 29, 2011 | Vancouver, BC, Canada

Cindy Fry and David Pistrui will present some of the preliminary results of the KEEN – TTI Performance DNA Assessment Project at the Annual ASEE Conference. Their paper entitled “Assessing the Entrepreneurial Mindset within Engineering Programs Across the Kern Entrepreneurship Education Network (KEEN)” will be presented on Monday, June 27, 2011 at 12:30 PM in the Vancouver International Conference Centre, room 107/108. We encourage all those attending the Conference to attend and offer their own insights and experiences.

We would also like to invite all faculty to join us at the KEEN sponsored Entrepreneurship Division Reception on Tuesday, June 28, 2011 from 7:00 PM to 8:30 PM in the Vancouver International Conference Centre, East Building, Room 19. At 8:00 PM KEEN attendees will congregate for a brief update on the KEEN – TTI Performance DNA Assessment Project to discuss next steps and preparation for the Fall 2011 launch of Phase II. For further information, please contact David Pistrui (dpistrui@acumendynamics.com).



BU: Inspiration Ambassadors

The Kern Family Foundation recently supported the first 17 Technology Innovation Scholars at the Boston University College of Engineering through BU's KEEN grant. Starting in January, Dr. Gretchen Fougere, Assistant Dean of Outreach and Diversity, directed these select engineering undergraduates. These students served as “Inspiration Ambassadors”, sharing their passion and enthusiasm for engineering with outreach to over 450 K-12 students. As their education progresses, these Inspiration Ambassadors will continue to develop their entrepreneurial mindset by developing outreach curricula, presenting to diverse audiences, mentoring more K-12 students and working in cross-functional teams.

Initially, Inspiration Ambassadors mentored local FIRST™ robotics teams and shared their technical skills in programming, CAD, and electronics design and as well as their passion for innovation and engineering. Working 8 hours every week over several

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BU: Inspiration Ambassadors *continued*

months, these Ambassadors traveled to local high schools in Boston. They, in turn, gained first-hand knowledge of their outreach “customers” and the public school environment. One student remarked, “I have never been in an inner-city school, and I feel I had many misconceptions... It was really heartwarming to see the kids from lower socioeconomic backgrounds striving to go to college.” The teachers leading these FIRST™ teams were impressed with how well the Inspiration Ambassadors connected to the younger students. Three of the eight teams BU mentored won awards at the FIRST™ Regional Competition at BU.

In addition, students from BU have hosted or visited other *Massachusetts*’ schools in efforts to share the impact of engineering on addressing the



Award-winning Brighton High School FIRST™ robotics team with 3 BU Inspiration Ambassadors, April 2011.



Four BU Inspiration Ambassadors share their passion for engineering and innovation in MA, May 2011.

speakers. Many of our students envision engineers as nerds, but the BU students presented themselves very well and helped to dispel this notion.”

At BU and in the high school classrooms, hands-on engineering design challenges that link math and science were presented. For example, in one challenge, students were “spies” that designed a vehicle to deliver a top-secret package down a mountain zip-line quickly and safely; they had finite time and materials in their “spy kit”. According to their teacher, this physics class has only one chance throughout the year to design something. One student, after returning from detention, proudly reported how one part of their design minimized friction for the sake of speed, and another part of the design leveraged friction to balance the vehicle.

problems facing our globe regarding energy, the environment and healthcare. One interactive presentation focused on the National Academies Grand Challenges for Engineering and was presented to more than 450 students so far. During one outreach presentation, in an auditorium of 200 high school students, over 20 students were active participants and many more had numerous questions for the Inspiration Ambassadors. A math teacher noted that many of the quieter, reluctant students were actively engaged in the program. Her fellow physics teacher remarked, “The slides gave the students an idea of the broad range of projects engineers work on, and that was reinforced nicely by the student



Two freshmen from Boston Collegiate Charter High School design a zip-line vehicle at BU, March 2011

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BU: Inspiration Ambassadors *continued*

BU Inspiration Ambassador testing zip-line vehicle to see if it meets design criteria, March 2011

The next steps of the outreach program are to develop curriculum called “Innovations in a Box”, a term coined by Professor Jonathan Rosen, one the leaders of the Kern Grant at BU. “Innovations in a Box” are demos or hands-on activities which connect the Grand Challenges for Engineering to the *Massachusetts* math and science standards. Currently, BU Inspiration Ambassadors are helping Dr. Fougere develop these modules based on technologies that sparked their interest in engineering, while other modules represent expertise at BU, such as energy and nanotechnology. Recalling and communicating their passion for innovation reminds Ambassadors why they decided to become engineers, and it reinforces their potential as future innovation leaders. This outreach program allows Ambassadors to hone their entrepreneurial skills as they understand customer needs, communicate to diverse audiences and work in teams. By engaging in every step of the outreach experience, Ambassadors can internalize the entrepreneurial mindset and establish a process that can be shared with the KEEN network.

-Gretchen Fougere, Boston University



***The Journal Of
Engineering
Entrepreneurship***

Fall 2011

Special Issue –

***Engineering Entrepreneurship Education Assessment:
Current Practices, Opportunities and New Frontiers***

Entrepreneurship education is increasingly expanding into engineering and science curriculums and programs around the world. The need to develop a new class of entrepreneurial engineers (and scientists) to serve the changing needs of industry and academia is paramount to national competitiveness and socioeconomic well-being and growth. As entrepreneurship is being integrated into engineering education, one of the primary needs and challenges is how to assess and measure the impact of programs and processes.

This paradigm of change presents both challenges and opportunities to educators around

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JEEN: Fall 2011 Special Issue *continued*

three central themes. First, developing, implementing and assessing entrepreneurial programs bring engineering educators into new and unknown territory steeped in the social sciences. Concepts such as “an entrepreneurial mindset,” “developing soft skills,” and “human subject research” are evolving as key attributes of the engineer of the future. Second, integrating entrepreneurship into engineering education places new demands in terms of resource allocation. Developing rigorous and valid assessment frameworks requires an investment of time and energy in addition to the primary tasks at hand in engineering education today. Thirdly, creating effective new methods, instruments and frameworks demands new thinking that challenges many of the traditional engineering education paradigms.

To address the issue of assessment in engineering entrepreneurship education, JEEN will publish a special issue focusing on the following themes:

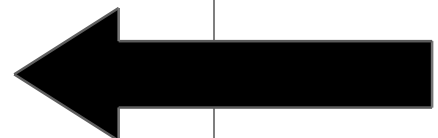
- Assessment methods, models and techniques being employed today
- Measuring mindset, soft skills and personal and professional competencies
- Assessment, retention and student development
- Applying assessment frameworks and advocating reform and change
- Defining, operationalizing and assessing learning outcomes
- Leveraging the KEEN – TTI Performance DNA methods
- ABET a – k performance criteria and engineering entrepreneurship assessment
- Qualitative approaches, models and methods
- Program development, fund raising and assessment
- Social science and human subject research in engineering entrepreneurship
- The role of industry in developing engineering entrepreneurship assessment
- Other topics on engineering entrepreneurship assessment

Papers submitted for this special issue will go through a blind peer-reviewed process. Authors should place an emphasis on application and practice as opposed to just theory. This first of its kind special issue provides a unique platform to collectively take a critical look at the processes, tools and techniques being developed by educators and industry to transform engineering and science education in the 21st century.

Submission – July 1st, 2011

Final paper submission deadline – August 20th, 2011

Publication date – September/October 2011



All correspondence should be addressed to:

dpistru@acumendynamics.com and condoor@slu.edu.

Upcoming Events

- Join us at the ASEE Conference ENT Reception sponsored by the Kern Family Foundation and the KEEN Program, **Tuesday, June 28, 2011**. Take advantage of this networking opportunity being held in the Vancouver International Conference Centre, East Building - Room 19 from **7:00 PM - 8:30 PM**. All are welcome!
- Shaping Entrepreneurial Engineers (SEE) second workshop to be held **August 7-9, 2011**. The first workshop was a huge success and modules learned at that workshop are being used in classrooms across the Network. The Fall SEE workshop will again be limited to 40 participants. [Registration for this event has been extended until June 24](#) at 5:00pm CDT. Register now!
- Fall KEEN Conference will be held in Milwaukee, WI at the Hyatt Regency Hotel **September 30 - October 1, 2011**. PI's, mark your calendar for this KEEN event! Registration will open August 1.
- Planning is underway for the 2012 Winter KEEN conference and pre-meeting Winter SEE workshop. Next year's SEE workshop will be held in Orlando at the SeaWorld© Renaissance on **January 3-4** with the Winter KEEN conference to follow on **January 5-6, 2012**. Please mark your calendars for these events.

Please contact us with any questions or concerns you may have regarding these events.

We look forward to seeing you!

Living the Mission

Kern Family Foundation Mission:

The Kern Family Foundation seeks to enrich the lives of others by promoting strong pastoral leadership, educational excellence and high quality, innovative engineering talent.

Kern Entrepreneurship Education Network Mission:

To graduate engineers equipped with an entrepreneurial mindset who will contribute to business success and in so doing transform the U.S. workforce.



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