

the KERN FAMILY FOUNDATION

keen
Kern Entrepreneurship Education Network

THE HOWL



Newsletter Overview

Things, they are a-changing in the KEEN Network. If you aren't watching closely and you think things are relatively static, you may find yourselves being left behind. This issue of *The Howl* attempts to highlight some really remarkable milestones in the annals of KEEN lore.

We have just come off our second Shaping-the-Entrepreneurial-Engineer workshop. The workshop was held at the Generac manufacturing facility in Eagle, WI. Twenty-seven KEEN faculty members from various KEEN schools attended. In the wrap-up discussion with those present we heard comments like: "This was really good. We should be teaching our students this stuff." "Is there a textbook for this material?" While others said, "I don't see how what was taught has anything at all to do with entrepreneurial engineering." Hmmm. How can there be such a wide difference of opinion? Hopefully the first article in this issue of *The Howl* will lend some insights.

Assessment is progressing at break-neck speed. In our first year, we have over 2,600 students in our data base. We hope to exceed that number in the second year. David Pistrui will share an update of past results and this year's plans.

You will also be reading a couple of submissions from Lawrence Tech – one on problem-based learning and one on a special Alpha Award for which they nominated one of our Winter KEEN Conference speakers, Paul Wessel.

On August 12th, the Foundation hosted the second set of schools (Baylor, Detroit – Mercy, Dayton and Villanova) to offer a dense network proposal wherein all of them stood to receive a higher level of funding or none of them would receive funding if one or more failed to make a compelling case. In essence, they needed to demonstrate how they could develop synergy between them so that by their working together, they would create results that they couldn't accomplish working alone. They did a spectacular job. Although the results will not be official until after the October KFF Board of Directors' meeting, all indications are they will receive their requested three-year grant. Subsequent to the meeting, Dr. Jerry Jones, one of the presenters from Villanova, shared with his colleague Edmond Dougherty, also a presenter, the following: "If this work is completed, it is going to change the way all engineers are going to be

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trained, and how they work. It will be a whole new world. This is going to be an important day in history. You'll see. Mark my words."

The bar is being set so that schools who come to the Foundation for a grant sans partnerships with other schools may find themselves at a disadvantage. We'll be hearing about the trials, tribulations and benefits of participating in a dense network at the Fall KEEN Conference. In this issue, Sri Condoor will offer some personal insights about team formation and progress of our first dense network.

Finally, Karen Wilken, STEM Program Director at the Foundation, will share her thoughts about the STEM Pathway to KEEN and beyond.

With this issue of *The Howl*, we welcome five new engineering colleges to the KEEN Network: University of New Haven (Assoc. Prof. Jean Nocito-Gobel, PI), Western New England University (Assoc. Prof. Mary B. Vollaro, PI), Union College (Assoc. Prof. Ronald B. Bucinell, PI), Widener University (Assoc. Prof. Vicki Brown), and Bucknell University (Dean Keith Buffinton, PI). Please join those of us at the Foundation in welcoming these schools and doing everything we can to have them prosper in the Network.

Please enjoy this issue of *The Howl*. Join me in thanking and congratulating Sarah Hanna and Katie Sloan for all their work in producing the newsletter.

Also, please let us know how we might make it better and what else you'd like to read about KEEN activities.

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

Welcome Cohort IV!

Bucknell University (Lewisburg, PA)

University of New Haven (West Haven, CT)

Union College (Schenectady, NY)

Western New England University (Springfield, MA)

Widener University (Chester, PA)

Generac Hosts “Shaping the Entrepreneurial Engineer” Workshop



- By Mike Carr, Communications Consultant

As the pace of technology accelerates in the 21st century, the world of engineering is at the forefront. Preparing today’s students for the opportunities of this dynamic new world is one of the great challenges facing engineering universities today.

As part of its mission to advance engineering education and professional faculty development, the KEEN program sponsored a two-day conference – “Shaping the Entrepreneurial Engineer” – that was hosted by Generac Power Systems on August 8th and 9th at their manufacturing and training facility in Eagle, Wisconsin. Twenty-seven representatives from 14 KEEN institutions were in attendance.

The purpose of the event was to demonstrate some of the work required when introducing a commercial product to the marketplace, with an emphasis on engineering requirements for manufacturing. The workshop consisted of small group sessions, with 4 to 6 professors in each group rotating through a series of activities, each focusing on a particular challenge.

Representatives from WisCraft, Milwaukee Electric Tool, Rockwell Automation and Generac took part by making presentations or coordinating one of the activities. Engineering consultant David Rank, a former Harley-Davidson engineer, helped conceptualize and plan the group activities.

“The primary goal was to show ways to bolster the teaching of engineering fundamentals by bringing applications into the classroom,” Rank says. “Through these activities, students learn to appreciate how many times the answer is not given, as well as discern what’s important and what’s not. They also discover how important variation is, how to apply problem-solving techniques and how to work effectively in teams. Those are the kinds of knowledge students will need in the real world, outside of the class environment.”

The theme of the conference was variation and its importance at every stage of product development. Particular emphasis was given to considering and addressing the needs of all the stakeholders involved, from the manufacturing and assembly teams to the seller, the end customer and those who will be servicing the product in the field.

“The activities highlighted some of the steps required to advance a first-article pro-

“When they see the big picture, they realize that there are many ways to succeed, even if the first one doesn’t work out.”

***George Simmons,
Villanova Univ.***

prototype to a commercial product,” explains Tim Kriewall, KEEN director. “One showed the difference between verification, which is designing the product correctly, versus validation, which is designing the correct product. Another covered the design of experimentation, showing the interaction between independent variables in the performance of a product. A third activity analyzed the process of design characterization, and another demonstrated the challenges of designing for assembly.” In the latter, participants were given 30 minutes to build an electronic component from an assortment of parts, with only a poorly written set of instructions as their guide – illustrating how engineers can overlook simple but key details in creating new products.

Each group was also briefed by Generac’s technical training team, who showed how generator design elements can affect the product’s serviceability for maintenance or repair. They emphasized the value of having comprehensive and well-organized information for troubleshooting and repairing products in the field. After the sessions, participants toured the production facility.

“Hosting this workshop at a manufacturing plant made the subject relevant in very positive ways,” Kriewall says. “Having the professors interact with working engineers in this environment was extremely beneficial.”

George Simmons, a successful entrepreneur now in his second year as professor at Villanova University, was enthusiastic in his assessment of the event and the value of the KEEN program. “I see tremendous added value to an engineer who has the entrepreneurial mindset,” he says. “I was very impressed with the hands-on activities that can be used in the classroom, as well as the emphasis on learning from failure, which is something all students need to understand.”

“In the classroom, everyone is focused on tests and grades, but in the real world it’s not like that. Students need to start transitioning from the schoolwork mentality – where it’s all about the score they achieve – to thinking differently in a business environment, where they’re not afraid to take risks or fail when pursuing an opportunity. When they see the big picture, they realize that there are many ways to succeed, even if the first one doesn’t work out.”

Please visit www.KEENNetwork.com to view and download photos from the event!



Photos



(Above) SEE Workshop participants, facilitators, staff, and guests.



(Left) Mr. Kern poses for a picture with SEE participant Raghu Echempati from Kettering University

(Right) Jackie Ackley, an employee at Wiscraft, demonstrates how she does her job. Wiscraft creates jobs for the visually impaired.





(Left) Participants listen to a lesson on serviceability from Generac employee Rob Woelfle during the Characterization session.

(Below) Tokunbo Ogunfunmi (Santa Clara University) tests the output voltage from the water battery exercise during the Validation/ Verification session.



(Above) Participants (L to R) Ken Bloemer (University of Dayton), Jay Goldberg (Marquette University), and Sri Condoor (Saint Louis University), launch a ball from the statapult, an exercise done during the Design of Experiments session while facilitator Roger Neitzel (Milwaukee Tool) observes.

2011 Fall KEEN Conference - Sept. 29 - Oct. 1

Pre-Conference Assessment Meeting - Sept. 28

The Fall KEEN Conference will take place in Milwaukee once again. This year, the conference will kick off with a pre-conference meeting on assessment. This meeting will continue the discussion from the Spring meeting on assessment held at LTU last March.

The Fall Conference will revisit the topic of dense networks and deliver an update on progress made since the last Fall Conference. We'll hear from a faculty member with new ideas on smart product design and a recent graduate will tell us what he wished he would've been taught during his engineering education.

The meeting will wrap up on Saturday with an update on assessment and some important information about the annual SWOT analysis required by the Foundation.

Should you have any questions regarding the Fall Conference or pre-conference meeting on assessment, please contact Sarah at shanna@kffd.org.



Planning for the Winter Conference is underway. The conference will kick off with a day and a half Shaping the Entrepreneurial Engineer (SEE) workshop on January 3rd and 4th. The SEE workshop will be followed by the annual Winter KEEN Conference on January 5th and 6th.

The Kern Family Foundation will sponsor attendance, travel and meals for up to five participants from each KEEN school. As always, more than five people from each school may attend. We encourage people from all areas of your KEEN institution to get involved. This conference is "new-to-KEEN friendly" and we look forward to meeting new members of the KEEN team each year.

This year's Winter Conference will be held at the Renaissance Orlando, right across from SeaWorld in Orlando, Florida. Registration will open on October 17th and will close on November 23rd. Please remember to register early and before registration closes to assist Foundation staff in ensuring that you have a wonderful conference experience.

Should you have any questions regarding this conference, please do not hesitate to contact Sarah at shanna@kffd.org.

KEEN—TTI Performance DNA Assessment Project Moves into Phase II

KEEN – TTI Performance DNA Assessment Project Phase II

Phase II of the KEEN – TTI Performance DNA Assessment Project is well underway with excitement and fanfare. Building on the success of the first year with 2,611 students from across KEEN participating, we expect Phase II will see more students participating and expanding faculty leadership. KEEN's goal is to administer the KEEN – TTI Performance DNA survey to all freshmen the first two weeks of the fall term. KEEN faculty are encouraged to work with the KEEN – TTI assessment leadership team to identify at-risk students who may be susceptible to the differences in personal behavioral styles and the engineering curricular environment. There is a collection of valuable resources, including "study habit recommendations," available at <http://www.tikeen.com/resources.html> and www.keennetwork.com that have proven to be valuable to faculty and students.

KEEN Adds Staff to Help Support Assessment Activities

To support this growth, the Kern Family Foundation has added staff to assist with the administration and processing of faculty needs. In June, Katie Sloan joined the Foundation as the KEEN Program Assistant. Katie is the point person to assist faculty with TTI link set up, report generation, data management and general administrative matters related to the KEEN – TTI Performance DNA Assessment Project. In August, Katie spent two days at the TTI headquarters in Scottsdale, Arizona learning about the Internet delivery system, link set up, report generation and back-end operations that are critical to the project. Currently, she is working with KEEN Assessment Fellow, David Pistrui, to build a master database available to all faculty for student development and research.

KEEN Offers a Monthly Series of iLinc Assessment Web Sessions

KEEN is offering monthly web-based iLinc sessions to bring faculty together to share experiences, exchange ideas and develop common research and analysis around the KEEN - TTI Performance DNA Assessment Project and other school-based assessment initiatives. The first iLinc session had eighteen participants from ten KEEN schools. Our next iLinc session is scheduled for Wednesday, September 14, 2011, at 12 noon CDT (1 pm EDT and 9 am PDT). Please join us for this interesting and topical exchange. Contact Katie Sloan at ksloan@kffd.org to reserve your spot.

Pre-conference Assessment Meeting – Thursday, September 29, 2011

A Pre-conference Assessment Meeting will be held Thursday, September 29, 2011 in Milwaukee prior to the Fall KEEN Conference. This fun-filled event will feature updates from across the KEEN network and reports from the five working groups (Rubrics, ABET, Research Methods, Demographics and Body of Knowledge). Updates and discussion related to the KEEN - TTI Performance DNA Assessment Project and entrepreneurial-minded engineer research project are also on the agenda.

- David Pistrui, KEEN Advisor

In-House PBL Workshops 101

- By *The Lawrence Tech PBL Training Team*

The logo for Lawrence Tech, featuring the words "Lawrence" and "Tech" in a white, sans-serif font stacked vertically on a blue rectangular background.

Lawrence Technological University conducted a four-day intensive Problem-Based Learning (PBL) workshop on May 16th – 19th, 2011. Thirty-one faculty including five from Dynamic Compass Network (DCN) institutions, participated in activities designed to teach them about the important aspects of PBL problems and help them develop problems for their courses. The Lawrence Tech faculty who participated are part of the Lawrence Tech Kern Innovative Teaching (KIT) faculty group that grows each year as more faculty join the program. Faculty worked in groups during Active and Collaborative Learning (ACL) icebreakers and PBL activities to experience the problems themselves. They also assembled in content-aligned teams, such as calculus and statics, when they worked on developing their own PBL problems. The workshop included presentations and activities designed to explain the important “ingredients” of successful PBL problems and tips on how to write effective problems beginning with writing clear instructional objectives and ending with how to assess effectiveness of PBL problems.

This workshop represents the cornerstone of the Lawrence Tech course modification process. Lawrence Tech is modifying 70% of our engineering curriculum to instill an entrepreneurial mindset into the students, and is using two major themes for the faculty development, PBL and ACL, with the entrepreneurial mindset as an overarching theme. The weeklong workshop themes alternate between PBL and ACL each year, with a one-day entrepreneurial mindset workshop in the previous week beginning the process each year. The goal is to foster greater student engagement and collaboration by focusing on real-world problems throughout the curriculum. Since this year’s workshop included participants from Boston University, Gonzaga University, and St. Louis University, the process has begun to share these workshops across the DCN and the KEEN network in general.

This year’s PBL theme workshop was presided over by Lawrence Tech faculty including Andrew Gerhart, Hiroshan Hettiarachchi, and Donald Carpenter from the College of Engineering and Nicole Villeneuve and Scott Schneider from the College of Arts & Sciences with logistical support from Entrepreneurial Leadership Coordinator Katie Hayes. The trainers were all part of the first KIT cohort two years ago and were chosen to be presenters for the PBL workshop based on their experiences and expertise with the methods involved. The trainers were fortunate to have been guided by two previous theme workshops led by national presenters Mark Serva and Richard Donham (University of Maryland) and Karl Smith (University of Minnesota). The Lawrence Tech presenters were also given permission to adapt/modify (with acknowledgement) some of the presentations from the outside presenters. With the goal of keeping con-

nections between the different faculty cohorts, some faculty from the first, second, and third KIT groups also gave short testimonials and examples of successful course integration. It was an intensive minds-engaged week, but there were very positive ratings and comments from the participants – a very satisfying experience from the view of the trainers and the participants.

Selected comments from the evaluations:

The review of and critiquing of PBLs were very useful.

Thank you, very useful in presenting an approach that would encourage/excite students to be engaged with learning and teaching.

The feedback on the "PBL snapshot" was invaluable.

I liked the addition of development time, very useful!



“We were very excited to have external participants from other KEEN schools as part of the process this year and would like to thank the faculty from Boston University, Gonzaga University and St. Louis University for contributing to the process. We can feel the network synergy growing every year and can’t wait to see how this evolves.”

-Donald Carpenter

A Man, His Son and an Invention

- By Filza Walters, Lawrence Technological University



Each year, the Engineering Society of Detroit (ESD) recognizes outstanding achievements at its Annual Meeting held in June. The coveted 'Alpha Award' is given to an individual who has demonstrated that their invention has transformed lives. This year, with a pool of strong applicants, only three individuals were selected to receive the award.

Lawrence Technological University was proud to nominate one of this year's recipients: Mr. Paul Wessel, a friend of the KEEN Network, and a serial entrepreneur with a captivating story. Originally from Michigan, Paul and his wife Shelley met Dr. Walker, Dr. Vaz and the rest of the Lawrence Tech contingency at the January KEEN conference in Arizona and stayed in close touch since. Those who attended the January conference, and heard Paul speak, can attest to the strength of Paul's message, his journey, and the story.

Paul and Shelley flew to Detroit on June 21 and spent Wednesday June 22 on Lawrence Tech's campus, before attending the gala event on Thursday evening, June 23, 2011. While on campus, they visited lab facilities, spoke with department chairs, and shared 'ideation' opportunities with faculty from engineering, science, technology, architecture and management. Prof. Filza Walters shared that during his visit to the many labs, Paul remarked, "I feel like a kid in a candy store!"

With interests and work spanning the fields of architecture, biology, medicine, computing, controls, energy, heat transfer, mechatronics, marketing and product development, "Paul has much to offer our students and the Network in the way of encouragement, support and inspiration," remarked Prof. Walters. Grateful for the introduction, she commented, "Never underestimate the power of your KEEN network!"

Welcome home Paul.

An excerpt from Paul's award submission, his presentation to Lawrence Tech, and a mini-video clip can be found on the KEEN website or by visiting <http://www.youtube.com/watch?v=OcKajjnNsBI>. Pictures from the awards ceremony can be accessed at <http://www.flickr.com/photos/engineeringsociety/>.

Excerpt from 2011 ESD Alpha Award, Nomination Essay, Detroit Michigan – Mr. Wessel’s second youngest son, Luke, 3, was diagnosed with Type 1 diabetes. Thus began an incredible daily routine...Luke’s regimen consisted of counting carbohydrate intake at each meal, pricking his fingers for blood sugar samples as often and eight times a day, and injecting insulin to maintain normalized blood glucose levels.

As Luke’s diabetes progressed, he grew tired of daily blood tests, so he began hiding his blood glucose meter as a means to avoid the painful procedure. This game of Hide and Seek went on for over a year.

One day, as the Wessel family pulled away for a long, overdue vacation, Luke yelled out that he had forgotten his GAMEBOY. Mr. Wessel stopped the car and unlocked the house so Luke could get his GAMEBOY. Luke immediately went over to the sofa, lifted up the cushion, and retrieved his prized possession.

The AHA moment came! Wessel immediately connected the dots.

“If there were a means to integrate a blood glucose meter with a GAMEBOY system, then at least Luke wouldn’t have the excuse of losing his meter anymore”.

While he didn’t know it at the time, Wessel was beginning a 10-year product and company development odyssey. In 1999, he filed his first provisional patent for a medical device that could integrate with handheld consumer electronic devices such as video game controllers, mobile telephone, and MP3 players. Other provisional patents soon followed that incorporated disease management methodologies with other types of consumer electronic devices.

Wessel’s first product initiative was known as Glucoboy – an integrated blood glucose meter that could be inserted into a Nintendo GAMEBOY system.

From the start this was a very complex product development process for it was the first time in history that a consumer electronic device and medical device were to become so closely integrated. As a result 3 independent product development efforts emerged, all with historical significance.

Nintendo – In order to properly interface with Nintendo’s GAMEBOY and DS system a proprietary chipset that contained startup system boot protocols was required to be integrated into the circuit board of the medical device. **It took 4 years** to gain approval from Nintendo Corporation in Japan.

Video Game Play – Video game play contained within the medical device still needed to be compelling enough to engage the user and continue using the device. Video game development **took over 2 years**.

Regulatory Approval – This was the first time a medical device contained video gaming software that utilized actual medical test results as part of game progression. This device not only had to accurately analyze blood glucose tests, the video game content could not lead to any adverse responses as well.

Wessel was integral with all phases of the product, prototyping through commercialization. On the medical and regulatory side, Wessel also wrote the first FDA and CE submissions as well as the product's first clinical trial to prove medical efficacy.

CE (European approval) was achieved in less than six months while FDA approval took almost 2 years to secure.

In December 2002, Wessel was awarded his first patent, US #6,494,830 – Handheld Controller For Monitoring Using Medical Parameters. In March of 2004, Wessel was awarded his second patent US# 6,699,188- Interactive Reward Devices and Methods.

In March 2008, all of Wessel's perseverance was rewarded when Bayer Diabetes Care acquired his company, Guidance Interactive Healthcare, for nearly \$40M. From 2008-2009 he assisted with updating Glucoboy to work with Bayer's blood glucose meter strip technology and the Nintendo DS gaming platform. While at Bayer, Wessel continued to invent other products as well – one of which resulted in a patent filing in late 2008 US Patent Application #20100206751 – *Supply Organizer and Health Management Methods*.

Glucoboy is now marketed under the Bayer Diabetes Care brand name of Didget.

Didget was officially launched in June of 2009 in the United Kingdom. Since then, it has also been rolled out in the United States as well other major European countries. To date over 57,000 units have been produced.

Wessel's groundbreaking works with integrating medical devices into consumer electronics claim a number of industry firsts.

- A blood glucose meter was designed specifically for children with diabetes.
- A medical testing device that provided digital incentives for properly maintaining a well-managed disease state.
- A medical diagnostic device that was integrated with video gaming technology, receiving worldwide medical device regulatory approval.
- A video game product and platform was reimbursed by health insurance.
- First time Nintendo Corporation allowed use and placement of a proprietary chip on another device.

In 2003, Wessel was recognized by the Minnesota High Technology Association as its ‘Innovator of the Year’ for a small company. His work has been featured in television and print media all over the world culminating with a feature story that appeared in the April 19, 2010 issue of *Business Week*.



Seated Front Row (L to R):

Dr. Lewis N. Walker, President

Mr. Paul Wessel, Alpha Award Winner, Serial Entrepreneur

Mrs. Shelly Wessel

Dr. Maria Vaz, Provost

Standing Back Row (L to R):

Dr. Philip Olivier, Electrical and Computer Engineering Department Chair

Professor Filza Walters, Architectural Engineering Program Director

Mr. John G. Petty, Lawrence Technological University Board of Trustees (Former Director, Fox Vehicle Program, General Motors Dynamics Corp.)

Dr. Nadia Shuayto, Assistant Professor & Chair, MBA & BSBM Programs

Mr. Steve Brown, Vice President for University Advancement

Dr. Elin Jensen, Associate Dean of Engineering, Graduate Studies and Research

Mr. Nameer Tillo, Graduate Student, Mechanical Engineering (Team Member of Formula Hybrid SAE & Blue Devil Racing)

Update on the Dynamic Compass Network (DCN)

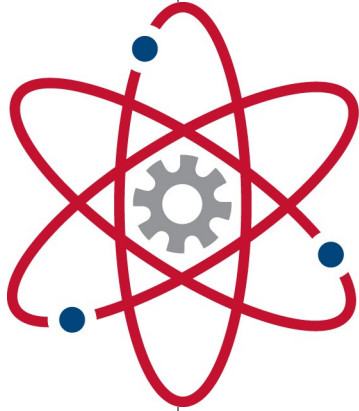
- Submitted by Sri Condoor, Saint Louis University

As you know, the Dynamic Compass Network formed in October 2010 at the KEEN Fall Conference as part of the Kern Family Foundation poster competition. The Dynamic Compass Network (DCN) is now an active dense network composed of six KEEN institutions - Boston University, Gonzaga University, Kettering University, Lawrence Technological University, Saint Louis University, and Worcester Polytechnic Institute – working together to promote e-mindset across the six campuses.

The DCN is off to a very good start with two major events - the first summer faculty development workshop in May'11 and student boot camp in August'11. Both these events were hosted by Lawrence Tech and made available to the entire KEEN. 25 faculty from Lawrence Tech, Saint Louis University, Boston University, and Gonzaga University attended the LTU Problem Based Learning (PBL) workshop. The student boot camp involved two days at The Henry Ford (including Greenfield Village) and the F150 assembly plant, and three days on the LTU campus. 19 of 23 students are from outside LTU. It shows the depth of participation from different institution and also, LTU commitment to this dense network. In October, SLU is hosting “Innovating the Curriculum with E-mindset: Focus on Structural Mechanics.” This workshop will be the first in a series of workshop focused at bringing the KEEN best practices to innovate traditional engineering courses.



At the back-end of these activities, the PIs are working together by email, phone, and face-to-face meetings to make these events successful and also, planning several new activities. You will hear about these new initiatives SOON – Keep your eyes and ears open for opportunities!!!



PROJECT LEAD THE WAY

PLTW

PLTW Connection

The October 2010 KEEN meeting featured a half-day workshop on Project Lead the Way (PLTW), a national program that inspires and prepares the next generation of technical talent.

So what's the big deal about PLTW students? My esteemed colleague, Dr. Tim Kriewall, could not have said it better as he introduced the workshop last October. He said, "It's easier to grow championship roses if you start with roses. You may know a rose when you see it, but does your admissions office have a way to screen for roses?"

PLTW experience might be another tool for your admissions office to use in the search for students with a propensity to be retained and flourish in an engineering program. More than enhancing math scores, PLTW enables students to learn the "habits of mind" of engineers who can thoughtfully approach open ended problems with multiple solutions. They also design, create and communicate as part of the coursework, so the more PLTW experience, the better in learning these skills.

I just finished reading a book I highly recommend called Educating Engineers. It was published by the Carnegie Foundation for the Advancement of Teaching as part of its series on preparation for professional careers. Dr. Sheri Sheppard, a professor of mechanical engineering at Stanford University, was the lead author. This study outlines a new paradigm for engineering education that focuses on professional practice, so that undergraduate education includes the judgment, observation and thinking skills that, combined with technical knowledge, create a quality engineer.

What struck me about the study is the unspoken assumption that students come to the doorstep of undergraduate engineering institutions unformed. Of course, that's not true. A student's background in math is essential, as is his or her ability to persist through challenges, collaborate in teams, apply creative thinking to ambiguous problems and communicate effectively. Yes, the KEEN program outcomes start to form well before students hit your doorstep!

High schools have heard the call for more emphasis on STEM education, and both

specialty STEM schools and local enrollment comprehensive high schools are answering. For many, PLTW is a solution to meet STEM objectives, and college faculty members have some assurances of what students are learning through the PLTW course structures, national exams, and portfolios. Since the PLTW network includes 4,000 schools nationwide, almost every college in the country has the opportunity to connect with a local PLTW school as well as recruit from a broader base. You might consider both as part of your institution's outreach and admissions practices.

What to do next?

Review the presentations and preconference agenda packet from the fall 2010 meeting, found at the www.KEENnetwork.com under Past Events (three links) to become familiar with PLTW.

Check with your admissions office and learn if they have contacts with PLTW students or target PLTW schools. Admissions can build lists of PLTW schools and contacts from http://www.pltw.org/getting-started/school_locator.

Continue to watch the Howl for more information. The Kern Family Foundation will be encouraging the networks of PLTW schools and KEEN colleges to build relationships. Your campus can offer opportunities to PLTW high school students and teachers that we will highlight throughout the coming year, so keep us informed. In addition, the Foundation may pull together an advisory group to guide the development of additional opportunities.

What will these opportunities look like? The Foundation piloted a project-based learning exchange this summer between Sharon Tomski, a PLTW master teacher and instructor at St. Thomas More High School in Milwaukee, and Dr. Andy Gerhart, associate professor of mechanical engineering at Lawrence Technological University. The report back was promising. It will be exciting to grow this effort and do more to make sure students are well prepared from the start to succeed in your engineering programs.

- Karen Wilken, Kern Family Foundation, K-12 STEM Director

Upcoming Events

- The Fall KEEN Conference will be held in Milwaukee, WI at the Hyatt Regency Hotel **September 30 - October 1, 2011** with a pre-conference assessment meeting on **September 29**. See page 7 for an overview of the conference and pre-conference meetings.
- The 2012 Winter KEEN Conference and pre-meeting Winter SEE Workshop will be held in Orlando, Florida at the SeaWorld© Renaissance. The SEE Workshop will take place on **January 3-4** with the Winter KEEN conference to follow on **January 5-6, 2012**. Please mark your calendars for these events. Registration will open **October 17, 2011**. Visit www.kffdn.org for more information!

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

We look forward to seeing you!

Have a great fall semester!

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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