



MARCH 21-22, 2014

SAN JOSE, CA

POSTERS

Steven Abel, abelsd@jmu.edu 4-VA at James Madison University

In 2010, the presidents of four universities combined forces with the governor, other members of the Virginia government and Cisco Systems, Inc. to launch 4-VA in response to the Governor's Commission on Economic Development & Job Creation. 4-VA was born as a collaborative partnership between University of Virginia, James Madison University, George Mason University and Virginia Tech. Its mission is to promote inter-university collaborations that leverage the strengths of each partner university in order to accomplish much more than any individual university could achieve alone. We began by leveraging new tele-presence technology to build live virtual environments at each university. Each day we continue to research and build our technological assets to help achieve our mission. In addition 4-VA strives to do the following: 1. decrease the cost of delivering instruction 2. expand access for all Virginians to programs preparing them for rewarding careers 3. increase research competitiveness 4. enhance the success rate of students in Science, Technology, Engineering, and Mathematics (STEM) courses and programs.

Anupama Atluru, anupama.atluru@utsouthwestern.edu Safe-C Pump: Mitigating Impacted Fetal Head

C-section delivery is the most common surgical procedure in U.S. hospitals, accounting for approximately one-third of deliveries annually. During Cesarean section, the physician may discover a fetal head deeply impacted within the maternal pelvis, increasing difficulty and duration of delivery and likelihood of adverse maternal and fetal outcomes. Research indicates that some degree of impaction presents in as many as 25% of all C-sections, translating to ~330,000 cases annually in the U.S. alone. Although existing devices alleviate fetal head impaction during vaginal delivery, there are currently no devices that address impaction during Cesarean section.

The preferred method is via manual extraction known as the pull method, which may cause serious maternal and fetal complications such as intracranial hemorrhage. The Safe-C Pump is a positive-pressure fetal head disimpaction device that elevates the fetal head out of the deep pelvis with controlled pneumatic force. We are currently refining our device prototype based on clinician feedback and preparing to demonstrate device efficacy. Additionally, we are collaborating with the University of Texas at Southwestern Office of Technology Development and Dallas BioCenter to secure IP rights and solidify a development plan.

Jorge Bohorquez, jbohorquez@miami.edu Senior Design Project Practices in the BME Department of the University of Miami

This poster will present the current practices in the development of senior design projects at the Department of Biomedical Engineering of the University of Miami. The design sequence consists of three courses starting in the second semester of junior year. During the first semester, the students learn basic design concepts such as problem identification, teamwork, project planning, intellectual property, brainstorming, communication skills and regulation. They work on a problem defined by the faculty to practice basic design skills. During the second semester, the project identification, alternative generation and selection are done. The teams also develop and test a first proof of concept prototype. They revise their initial design proposition and plan for a second implementation and formal testing to be done during the last semester. The BME students interact with the students of the whole college of engineering to identify the interdisciplinary project. They also get instruction on general engineering ethics, project management, intellectual property and entrepreneurship. During the last semester the teams develop a second improved prototype and test the device in a laboratory and with users. They write a formal design report, a poster and oral presentations.

The design project is an invaluable and unique opportunity for the students to enhance and integrate crafts, design, human and basic sciences. They improve the critical thinking skills required for effective team interaction. Since all the teams will be required to build and test their designs, they will foster their crafts, experimental and troubleshooting skills.

Erik Loevgren Brejner, elb@viauc.dk
Empowering Entrepreneurship through Improving Campus Life

VIDEA is the student center for innovation and entrepreneurship activities at VIA University College, Denmark. There are 17,000 students across the seven VIA UC campuses. One of the activities on campus is the VIDEA Incubator. This initiative is both for the born student entrepreneurs and a few “made” entrepreneurs. To attract more “made” entrepreneurs, the VIDEA Incubator has launched a new concept called “Life on Campus”. The purpose of the concept is to give students hands-on experience with idea generation and implementation. “Life on Campus” begins with an idea generation workshop for all students interested in improving the daily life on campus. After the workshop, the different teams will become members of the VIDEA Incubator. For implementing their project the students will get support from the incubator staff members. The success criterion for “Life on Campus” is getting 50 students to participate from every campus. An example of a student project with the aim of improving the life on campus is the “Students Board of Ethics”. It is an association for students, who meet every third week, inviting key speakers within philosophy and ethics and discuss current issues such as euthanasia.

Yiqi Cao, y.cao@virginia.edu
Notivibe: Clean Hands, Healthy Babies

Notivibe is a positive reminder system that increases hand washing compliance among healthcare professionals. We designed Notivibe for the sensitive environment of NICUs, where premature infants are particularly vulnerable to hospital-acquired infections because of their underdeveloped immune systems. Our product uses existing RFID technology to create a zone of sanitation around the infant’s isolette. Healthcare professionals simply need to wear a wristband, which will vibrate to remind them to wash hands when they enter the zone of the patient. This simple reminder is important when healthcare professionals forget to wash their hands during their busy daily routines. Our design won 1st place in the UVA Engineering School Entrepreneurship Competition, and took 2nd place in the University-Wide Entrepreneurship Cup Finals, earning \$13,000 for our concept.

Julien Caubel, jcaubel627@gmail.com
Renewable Bio-Waste to Energy System for Rural Communities in the Developing World

Rural communities in the developing world are faced with a common lack of electrical power and clean water that inhibits agricultural productivity and economic development. A simple steam engine was designed, built, and implemented in a small Ghanaian community to address these deficiencies, producing economically and environmentally sustainable energy to meet local infrastructural demands. The steam engine is fueled by agricultural bio-waste and constructed from recycled materials, producing mechanical power that can be used to operate electrical generators, water pumps, grain mills, and other equipment. The purpose of this NCIIA poster is to present the results of a Fulbright Fellowship research project, during which a steam engine prototype was constructed in collaboration with students and faculty at Wa Polytechnic in the rural Upper West Region of Ghana. The engine was built using local recycled materials, such as automotive scraps, and shown to operate effectively when fueled with agricultural bio-waste, charging automotive batteries that are commonly used to light and power local households in Wa. The poster will provide an overview of the steam engine’s operation, construction, and preliminary implementation. The poster will focus on presenting the steam engine’s construction using salvaged materials, and the design features that were developed to maximize the combustion efficiency of low-grade agricultural bio-waste, such as cornhusks.

Marie Ernst Christensen, maec@viauc.dk
Entrepreneurial Modes of Teaching in Health Promoting Interventions

The Department of Physiotherapy and the Professional Bachelor Program in Nutrition and Health at VIA University College, Aarhus, Denmark merged on a new campus in an area that soon will host 25,000 workers and students. The geographical location provided a unique opportunity to create a practice-related teaching program focused on health promotion. The project creates a framework for the interaction of theory and practice. Moreover, this blend generates new modes of teaching due to the fact that the teaching is transferred from the usual environment to sites where the students experience the potential of engaging with real-time media, instead of just practicing their professional skills amongst their fellow students. The emerging didactical graphics in the teaching of entrepreneurship are conceptualized as elements where the students take action and thereby develop an active approach to learning (Blenker et al 2004). In this entrepreneurial mode of teaching the students get a unique opportunity to enhance their

competences in a relation with the participants from the organizations selected. This concept will reflect a close association with the students' professional practice in terms of their curriculum as well as extracurricular issues. This type of entrepreneurial teaching is associated with increased learning and better knowledge of practice. This type of inclusion of practice in the educational program is unique, particularly in the context of increased competences in the field of health promotion. Only positive contributions to the students' learning outcome on professional as well as personal levels have been registered.

**Whitney Crooks, whitney.crooks@tufts.edu
Using Social Networking to Develop
Advanced Control Strategies for Soft Robots**

The goal of our research is to develop a web-based platform that will enable others to create complex control strategies for soft robots. We have created a website that users can sign into using a social media account. Once logged onto the website, users can sign up for a time to control the robot, watch others control the robot, and interact with others via chat and commenting on blog posts. While users are competing for achievements like best time, we are collecting information on their control strategies through video of the robot and a record of key/button presses. The video is analyzed to determine position, velocity, acceleration, segment angle, and segment deformation. Combining this information with the crowd-sourced information, we can create genetic algorithms to determine the control strategies that take advantage of the intrinsic properties of that robot for a particular movement or sequence of movements.

**Howard Davis, davish@wsu.edu
Self-selection, Personality and
Entrepreneurship**

An often-asked question is whether or not entrepreneurs are born or made. As part of a teaming skills development exercise, the Myers-Briggs type indicator (MBTI) and the decoupling method developed by Douglas Wilde were administered to two different interdisciplinary cohorts. The first is an interdisciplinary, two-semester, capstone course for engineers, business students, and math/science students. The second is an interdisciplinary introduction to technical entrepreneurship that is made up of students that apply for a scholarship, are interviewed and selected for entrepreneurial traits. Four years of data (192 samples) were examined to compare the personality coordinates produced by the decoupled MBTI scores between different cohorts in these populations. The questions that were asked of the data were: Did the rigorous selection process for the scholarship produce a personality bias in the cohort? Did the stu-

dents in different disciplines differ from each other? Did the students in entrepreneurship as a whole differ from the normal population (decoupled coord mean of 0,0)? The results indicated that the capstone class was similar to the general population in the Perception Graph and showed a tendency to value more control in the Judging Graph. The scholarship cohort showed a tendency toward ideation and control, which is consistent with roles associated with entrepreneurship.

**Thad Druffel, conn.center@louisville.edu
Teaching Renewable Energy and
Energy Efficiency Entrepreneurship to
Engineering Students**

The engineering curriculum leaves little time for students to explore concepts outside the core technical courses offered within each discipline. This is unfortunate as students are not exposed to the skills needed to effectively work in teams and interact within an organization. We are developing a course that includes several disciplines within the engineering school exposing the students to topics in renewable energy and energy efficiency as well as entrepreneurship. Two projects are used to familiarize the students with entrepreneurial as well as intrapreneurial skills, meeting the breadth of requirements from startups to large corporations. The course is being developed by a professor with twenty years of experience in startups, small business and corporations and an instructor from the entrepreneurship department. The city chamber of commerce has assisted in recruiting entrepreneurs throughout the community to help the students in vetting their ideas from a business perspective.

**Nathalie Duval-Couetil, natduval@purdue.edu
Exploring the Value of Entrepreneurship Education
to Ph.D. Students in the STEM Disciplines**

A number of studies conducted over the last decade have reported consistently that many students who complete Ph.D. programs find themselves unprepared for the academic and non-academic career paths available in the current job market despite obtaining an advanced degree. The purpose of this study was to explore Ph.D. student perceptions of the value of entrepreneurship and additional professional skills training to doctoral programs to improve success and employability, particularly in an environment where innovation is considered key to economic growth. Research consisted of administering surveys and conducting focus group interviews with Ph.D. students in STEM disciplines at Purdue University in order understand their expectations about career paths, their level of preparation for them, and the extent to which entrepreneurship and professional skills training might assist them in acquiring a broader range of experience and marketable job skills during graduate school.

Cindy Gilbert, cindy_gilbert@mcad.edu
Application of Biomimicry to Innovation and Sustainable Design

Biomimicry, the practice of emulating models and strategies in nature, enables designers to see and learn from nature in new ways (Biomimicry 3.8 Institute). This poster describes the primary learning outcomes from putting the tools and methods of Biomimicry into practice for a social sustainability project. Biomimicry thinking was used to design a more sustainable water treatment system, called SolDrop. The resulting design idea and business plan was submitted to the Biomimicry Student Design Challenge and was a finalist at the Global Biomimicry Conference in Boston. This poster will discuss the challenges faced and lessons learned from integrating Biomimicry Thinking into the innovation process when conceptualizing sustainable design solutions. Finally, we will discuss future opportunities that have stemmed from experiences based on this work conducted for an MA thesis project in Minneapolis College of Art and Design's online Master's in Sustainable Design program, supported by NCIIA.

Cory Hixson, hixson@vt.edu
The Innovation Canvas: A Tool to Develop Integrated Product Designs and Business Models

What if there was a tool that encouraged technical and business exploration through a process more closely aligned with how it happens in a successful venture? We believe the Innovation Canvas represents such a tool; one that facilitates the development of integrated product designs and business models. This poster is dedicated to continuing the explanation, application, and dissemination of the Innovation Canvas (developed out of the 2012 Epicenter Retreat and further supported by the NCIIA).

Len Holmes, lhomes@uncp.edu
Biotechnology and Entrepreneurship in Southeastern North Carolina

The Thomas Family Center for Entrepreneurship of the University of North Carolina at Pembroke with funding from the NCIIA has created a flexible entrepreneurship program available to all undergraduate and MBA students. The new program focuses on transforming ideas into businesses, as well as protection of intellectual property. To bring real-world experience into the program, there is collaboration with the UNCP Biotechnology Center in the development of a new biological control product. Additionally, NCIIA seed funding has supplied inertia for the fall 2013 appointment of a graduate student from the School of Business to complete a marketing study aimed at sales and distribution of the developed prod-

uct. The product, Brave-Guard Beneficial Microworms, eliminates agricultural insect pests in an environmentally friendly way without the use of chemical insecticides. At present, Brave-Guard™ is being used in several regional field tests.

Charles Kim, cjk019@bucknell.edu
ProSEC: An Interdisciplinary Effort to Sustainably Address Eyecare in the Developing World

Worldwide, hundreds of millions of people suffer from uncorrected refractive error (URE). Faculty and undergraduate students in management and engineering are collaborating with local citizens in Guatemala to provide affordable eyewear to address URE in a semi-rural, outlying area. We have designed devices, inexpensively produced, using local materials and labor to facilitate accurate subjective refraction, obviating the need for either a highly trained optometrist or expensive technology, and to enable the production of stylish glasses acceptable to fashion-conscious Guatemalans. The business model calls for entrepreneurs to run their own independent businesses to diagnose URE and fabricate eyeglasses. By sourcing key elements in the local community and by providing economic opportunities and social benefits, the project contributes to sustainability. The pilot project in Guatemala will be replicated elsewhere in the country before moving into nearby countries and then into other developing nations.

Mallory Kolinski, mkolinski@sierranevada.edu
First Year Experience Course at Sierra Nevada College

This presentation will give attendees an understanding of how Sierra Nevada College faculty have redesigned the First Year Experience course to introduce students to design thinking as a format for real world problem solving while also introducing students to the academic culture of the institution. The presentation will discuss research used to identify aspects of design thinking that could be translated to the classroom, the process by which faculty developed the course and the specific details of the course itself. The innovative techniques used in this class will be valuable to any faculty member looking to design a course utilizing team-based learning or problem-based learning. It will also be helpful to any institutions looking at redesigning the FYE to better introduce the institutional culture through learning communities.

Sadan Kulturel-Konak, sadan@psu.edu

Workshops for Future Entrepreneurs

Penn State Berks Entrepreneurship students Minor held workshops for middle and high school students in the spring of 2013. The workshops first focused on what it means to be an entrepreneur, and then innovative thinking was practiced. Through self-assessment, students learned their passions, networking, and generating new ideas. Finally, they were taught the basics of a business plan and how to integrate their business plan with the needs of their community. These workshops were modeled on similar workshops carried out by Penn State students for the Children and Youth Empowerment Centre in Nyeri, Kenya in May 2012. Students overwhelmingly rated the workshops as very beneficial. These workshops were supported by the National Collegiate Inventors and Innovators Alliance (NCIIA).

Josephine Lee, leejosephinem@gmail.com

EPIC at Northwestern: Entrepreneurship in Action

EPIC is a scrappy team of 23 students, representing nearly all of Northwestern University's schools, who are on a crusade to change the entrepreneurship culture on a midwest campus. We are Northwestern's entrepreneurship student group that believes in interdisciplinary teams, exposing students to entrepreneurship, and connecting students to startups. We would like to highlight Project Pitch, our quarter-long entrepreneurship development program, NUVC, our annual student business pitch competition, our initiatives to create Predictive Analytics student meetups, an entrepreneurship dorm, a database of Chicago and Evanston startups, and Hackathons. We would also like to highlight our partnerships on campus with the Kellogg School of Management, student business groups, socially minded student groups, the Computer Science Department, the School of Engineering and the Farley Center for Entrepreneurship.

Mingming Lu, lumg@ucmail.uc.edu

Biodiesel and Business Creation from Trap Grease

Trap grease is the primary cause of pipeline blockage in the US and is therefore highly undesirable to the public sewer system and to waste water treatments plants (WWTP). There is the potential to turn trap grease into biodiesel, and three highly motivated students have started the journey to business formation around this idea, estimating the cost, attended various business plan competitions, and winning awards, including a NCIIA Phase I E-Team grant and first place in the Odebrecht Award for Sustainable Development.

Karen MacDonald, kmacdon4@kent.edu

The University Library and Entrepreneurship Outreach: Utilizing Valuable Resources

Business libraries can be valuable assets in college and university entrepreneurship initiatives. Libraries have moved beyond the traditional role of book depositories for the support of faculty research. These libraries are now information-rich sources of business and economic data, complete with specialized librarians that play a critical role in promoting the effective use of business information. By utilizing these valuable assets, the university can increase its profile with local businesses and increase its return on investment in the library's business collection. This poster presents a model that highlights various points where a library can make a contribution that extends beyond the business school: entrepreneurship experiential learning, programs for interdisciplinary (STEM) cross-training in entrepreneurship, commercialization of technology spin-offs, and active participation in local economic development programs and Chambers of Commerce. The model is illustrated with examples from Kent State University Libraries, which is committed to the economic success of Northeast Ohio.

Andrew Maxwell, andrew.maxwell@temple.edu

Master the Science of Innovation

Commercializing technological innovation has traditionally been viewed as a risky process with uncertain outcomes and a high failure rate. Developing a better understanding of how people (teams), technologies and markets interact requires a scientific approach that studies the difference between success and failure and provides valuable insights that increase success rates. Temple University has recently launched a series of courses, certificates and Masters programs that provide guidance to those interested in commercializing technology or managing innovation, either inside an existing company or through new company formation. These courses, developed through a collaboration between the Fox School of Business and the College of Engineering, provide participants with an understanding of the physical sciences and an introduction to the social sciences of innovation management.

Lawrence Neeley, lawrence.neeley@olin.edu

The Perfect Introduction to Engineering Entrepreneurship Module

A gap exists between instructors' desire to introduce entrepreneurship content into their curricula and their ability to do so. Challenges include high-level institutional concerns to low-level implementation details. The perfect module would meet each instructor at the level of her ability, interest and need, enabling her to easily and effectively deliver compelling, relevant and high-quality engineering entrepreneurship educational experiences

to her students. During fall 2013, we prototyped two efforts across two campuses as experiments in pursuit of this goal. Preliminary points of insight and discussion include: capital “E” entrepreneurship vs. an entrepreneurial mindset; the very different definitions, conceptions and expectations of entrepreneurship that students bring to class; giving and receiving (difficult) feedback and the necessity of learning to do both well; integrating entrepreneurship into existing courses: where you can vs. where you should; the surprising utility of cross-campus instructor conversations; and student relationships to work and the difference between happy teams and healthy teams.

**Diana Nicholas, dsn35@drexel.edu
Smart Initiatives = Smart Programs:
Interdisciplinary Programming and Research**

The Drexel Smart Initiatives Program (DSIP), an interdisciplinary technology-based program, grew out of The Drexel Smart House, a student led project to reconstruct an urban home to serve as a “living laboratory” for exploring modern, sustainable design and technology. The program’s motto is “Smart House, Smart Block, Smart Community” and it pursues the exploration of urban sustainable development as an engine for transdisciplinary education and translational research. This poster seeks to explore the dynamics of establishing such a program in an academic environment where conventional disciplinary lines are no longer useful. The re-structuring of research and practice around such topics-based problems has led to the creation of this program, which includes a student organization, an academic minor, a physical location, and a research agenda that cuts across disciplines. This poster aims to examine the place of such interdisciplinary models in undergraduate education as a model for innovation across disciplines.

**Gisele Ragusa, ragusa@usc.edu
Cultivating and Assessing Creativity
and Innovation in Engineering
and Science Students**

Over the past two decades, various research studies across education and business fields have attempted to measure individuals’ creativity and innovative behavior. The research on creativity has primarily been conducted in K-12 education while research in innovation has focused on workplace measurement. This poster presents results of research using a measure of engineering creativity and propensity for innovation called the Engineering Creativity and Propensity for Innovation Index (ECPII) used with undergraduate and graduate engineering and science students. For this study, the researcher measured students’ creativity and propensity for innovation as undergraduate and graduate college students at

13 universities. The ECPII was designed, tested and validated as a consequence of ongoing conversations with engineering educators nationally and a desire to assess the role that comprehensive pedagogical and curricular experiences have in important industrial and academic skill sets. Results of this study are that specific pedagogical and curricular practices promote and foster innovation.

**Michael Ramsgaard, MIBJ@VIAUC.DK
Transformative Entrepreneurship: A Review
of Pedagogies in Entrepreneurship Education
and a Suggested Approach for Launching
Entrepreneurial Transformation in Higher
Learning Contexts**

Research on entrepreneurial processes within higher education has had a growing interest in promoting entrepreneurial competencies that leads to creation of new startups. There is a growing debate whether responsibility for the process lies with the teacher, the content and setting or with the entrepreneur in-spe. This poster argues that a mix of all three elements added by a set of innovation drivers will promote entrepreneurial confidence and lead to higher entrepreneurial self-efficacy. It is argued that transformative learning should be the primary pedagogical and didactic focus in order to achieve impact in addition to a strong focus on entrepreneurial self-efficacy. It will be discussed whether ambitious learning goals and high expectations from the teaching team together with a focus on the creative learning setting can lead to higher engagement and leaps in the entrepreneurial identity transformation, that we are seeking as curriculum developers and educators.

**Eric Reynolds, ewr@mit.edu
Design For Scale / New MIT
Undergraduate Course**

Since 2003, MIT D-Lab has been educating student innovators and supporting them to work in developing economies. In 2011, D-Lab founded the Scale-Ups program to bring technologies to market at scale. It does so through support of early-stage ventures, technology transfer to SMEs, and partnership with corporations interested in launching new products or services in emerging markets. Through these programs, a variety of gaps were identified, in particular a lack of design for scale. From an engineering perspective, a lack of industrial design, failure mode and effects analysis, design for manufacturability, serviceability, distribution, etc. From a business perspective, a lack of market research, value chain analysis, and development of competitive supply chains, marketing, financing and sales. To develop emerging market-specific understanding in these areas, Scale-Ups supported the development of Design for Scale, a new course in

MIT's Office of Experiential Learning that first ran in fall 2013. It aimed to provide students with a team-based, multidisciplinary, large-scale, impact-focused engineering learning experience. Student teams were paired with a project sponsor, a start-up in Nigeria, India or Nepal and were provided with a working prototype and set of design goals. Teams spent the semester advancing their prototypes toward market-ready products and delivered their results to their sponsors at the close of term. The instructional staff noticed several themes through teaching the course, some of which have been benchmarked through conversation with other instructors and practitioners in this space. Initial results and reflections from the course will be presented.

**Judith Richards, jlrichar@callutheran.edu
Kenyan Female Entrepreneurs and
Negotiation Education: Exploring Efficacy
Development Utilizing Distance Learning**

Entrepreneurial higher education includes the study of desired skills, knowledge and competencies necessary to address varying learning styles and modes of delivery. Aspiring female entrepreneurs commonly lack key business skills that their male counterparts develop from experiences and expectations of the cultural environment. This skillset includes negotiation efficacy, a competency that may be pivotal for Kenyan women, especially those held back by poverty, which seek to launch a new venture. During the launch period financing requires astute negotiation skills to maximize the investment needed to establish a business. Entrepreneurs who are unable to secure the needed resources may never be able to move their venture beyond the conceptual stage. Studies show that women face greater challenges than men in securing venture financing. This study will explore educational training to Kenyan women via distance learning, to improve negotiation self-efficacy to maximize outcomes. The literature review and survey results from two workshops that were conducted will be addressed in the poster. Questions that will be answered include: How should distance learning, higher educational training be implemented to Kenyan women in order to improve negotiation self-efficacy? Can formalized training increase negotiation self-efficacy across key success factors including: likelihood in achieving goals, confidence and employing competitive and collaborative strategies?

Sherry Robinson, skr12@psu.edu

Trash to Treasure

The Trash to Treasure competition was one of dozens of hands-on activities completed by students in an intensive two-week summer entrepreneurship course focusing on sustainability. This interdisciplinary program included students studying engineering, law and leadership as well as business. Students came from Norway, France and the United States, providing an international dimension. The Trash to Treasure project was meant to provide students an opportunity to develop their skills in creativity and opportunity recognition. Students were provided with several large bags of "trash" and encouraged to seek out other discarded items. They were allowed to enter as many products as they wished. Teams then voted on the best portfolio of "treasures," with emphasis on originality, usefulness and viability. This competition, which was inspired by ideas presented at the Open 2013 conference, was one of the most popular activities of the entrepreneurship course.

Jon Schull, jschull@gmail.com

Jorge Zuniga, JorgeZunigaUlloa@creighton.edu

**E-nable: A Distributed Pay-it-forward
Network for Design, Customization,
and Fabrication of 3D-printed
Assistive Technologies**

We have initiated a distributed pay-it-forward network for the design, customization, and fabrication of 3D-printed assistive technologies, starting with the open source "RoboHand" contribution of Richard Van As. A dozen 3D printing enthusiasts who commented on the RoboHand project were invited to populate an online map of volunteers. Within a few weeks, this recruited two-dozen "Mak-erbotters willing to produce Robohands". Four months later, the "e-nable" Google+ community comprises 60 volunteers on five continents, developing improvements, sharing best practices, and self-organizing for collaboration and service. Few clients have been served yet, but the potential is clear. There is a yawning gap between one-off creation of custom solutions by engineering students, and the commercial distribution of often-expensive prosthetics to often-disadvantaged clients. Our project could encourage students and hobbyists to learn and contribute to emerging models of 21st century manufacturing, economics, project-based learning, and social and technological innovation, and global service.

Kevin Sexton, kevin.w.sexton@vanderbilt.edu
Resident Physicians as a Resource for Design and Innovation

At Vanderbilt we have begun using resident physicians as advisors for biomedical engineering undergraduate senior design projects. Projects are submitted by university faculty and selected by the undergraduate teams. The students are matched with a resident physician training in the area of their project. The resident acts as a project manager and liaison to the team helping them gather customer data, validate their market, and get feedback on the project. The project has led to increased satisfaction among engineering students and multiple patent applications.

Steve Shooter, shooter@bucknell.edu
Product Archeology: Integrating Global, Societal, Environmental, and Economic Considerations in Design

Product archeology draws from the well-established pedagogy of product dissection and the field of archeology. Participants may perform the initial steps of a product archeological dig by engaging in traditional product dissection. In subsequent analysis, however, participants explore a multidimensional landscape that includes questions such as, What societal trends led to the development of this product? What has been/will be the economic impact of this product on communities to supply raw materials? What is environmental impact throughout the life cycle of this product? In essence, product archeology encourages participants to navigate key questions related to systems engineering and touches upon issues of sustainability and ABET's global, societal, economic, environmental learning outcome. In this presentation we will provide examples of product archeology developed at Bucknell University and comment on its pedagogical effectiveness.

Wesley Steen, wsteen09@gmail.com
SOUP Spoon

The SOUP Spoon is an assistive eating utensil for individuals who struggle with tremors and fine motor skills and cannot eat independently without spilling. This often leads to embarrassment while eating in public environments as well as increased costs of care. We solve this problem with a low profile spoon that retains liquids to prevent spilling. The SOUP Spoon returns people's lives to normalcy by empowering them to eat independently, improving their quality of life and human dignity. We will share what we have learned while building this venture as well as while participating in events and workshops such as NCIIA's E-Team Program.

William Tita, w.tita@neu.edu
Matt Haffenreffer, matt.haffenreffer@gmail.com
Solpod and its Global Social Impact

Jola Venture is a small startup company, founded in 2010, with the goal of improving the lives of farmers through modern technology. Jola Venture's primary product is the Solpod, a solar dehydrator that can be used to dry fruits and vegetables which can then be stored for several months. The primary target market of the Solpod are Cameroonian farmers, 30-50% of whose crops begin to rot before they can be sold, leading to an inefficient and unprofitable way of life. In the past year, the Solpod has been designed for manufacturing and tested to validate its functionality. A manufacturing plan has been created that will sustain the production of hundreds to thousands of Solpods per year. Solpods can be sold at a margin of 40%. A cooperative Solpod server farm model will be available for use by common interest groups.

Brinkley Warren, brinkley.warren@leanmonitor.com
The Lean Spinoff: A Guide for Researchers to Build Successful Businesses

All around the world, money and talent is being wasted on research activities. In fact more than 80% of research results never get to market and exist only in scientific papers. This is a tragedy because it means that there is much progress and creativity that never reaches society, but instead exists only in the lab. Our vision is to help transfer research results into the market efficiently so that it can make a real impact on society. To do this, we will use the Lean Startup approach, and we will demonstrate how to adapt this proven and effective methodology and apply it to the university setting in order to increase successful innovation outcomes and maximize value-creation for the university, research team, and society. We introduce The Lean Spinoff model.

Don Wroblewski, dewroblewski@berkeley.edu
The Berkeley Challenge Lab: An Entrepreneurial Experience in Problem Solving in a Competitive and Tournament Style Environment

This poster will cover aspects of the Challenge Lab course model being developed within the Center for Entrepreneurship and Technology (CET) at UC Berkeley. The model is simple in principle; multidisciplinary student teams compete in a tournament style format to develop a product, project plan or start-up idea that addresses a real-world need. Challenge Lab courses provide an interactive, experiential, hands-on learning experience focused on entrepreneurial problem solving. This prob-

lem solving approach loosely follows the Lean Startup methodology. It is structured into four four-week iteration cycles that closely match standard business progress meetings. Real-life interrupts are injected strategically during the semester forcing teams to rapidly pivot and adapt. This validates the students' concepts and approaches. The response is to pivot or suffer a consequence. One such consequence is elimination through the tournament format. Founding teams are reduced by evaluation and the members of eliminated teams must market themselves to the remaining successful teams for inclusion. This in effects simulates founding teams and general employment. Challenge Lab courses are not meant as stand-alone courses on entrepreneurship, but rather as an experiential complement to more traditional course offered within CET. The final outcome is one of three industry-validated outputs depending on the type of challenge: logical business plan for broad, platform-type challenges; Product Management Plan for market-opportunity challenges; and Product Prototype for product-based challenges.