WHY GET A REAL JOB?
ENCOURAGING ENTREPRENEURSHIP IN UNDERGRADUATE DESIGN STUDENTS

Michael Elwell
Postdoctoral Research Associate – University of Notre Dame
melwell@nd.edu

INTRODUCTION

Current industrial design education adequately prepares students for jobs in the corporate or consultancy fields, but struggles to prepare them to be career entrepreneurs. Entrepreneurship is not only essential to rebuilding a recessed economy, but also empowers students to take control of their intellectual property. Educators must do a better job identifying students with entrepreneurial aspirations, and encouraging them to explore entrepreneurship as a viable alternative to traditional design employment.

It is illogical and wasteful to train students to be innovative and inventive, while not preparing them to properly leverage their intellectual property. Entrepreneurship must be integrated into the design curriculum to prepare students for the current economic climate, while maintaining core principles of social and environmentally responsible design. This paper documents and illustrates the process of establishing a culture of entrepreneurship within a traditional design program.

WHY IS ENTREPENEURSHIP IMPORTANT?

Entrepreneurship is important because it is the mechanism for implementing the concepts that designers create every day. In a sense, it is the best way for students to own the ideas they invent. Also, at present there has never been an easier time to be an entrepreneur, and industrial designers' technical and creative skills make them distinctly qualified to take advantage of these opportunities.

IT HAS NEVER BEEN EASIER TO BE AN ENTREPRENEUR
In his book, The Long Tail, Chris Anderson details how internet search is changing the future of business. Because of the effectiveness of internet search, consumers can more easily connect with the products they want to buy. This is "shifting the mass market to a market of niches (2009)." With a brick-and-mortar based economy, niche products were nearly impossible to offer, however, with internet storefronts, these same products can thrive.

In another Chris Anderson book, Makers, he explains that while launching a product was more daunting in the past, with the keys to manufacturing held by established professionals, the internet has been a "powerful democratizer (2012)." A decreased cost of rapid prototyping tools, and websites from Shapeways and Protomold, make it easier to efficiently and effectively test concepts. Social media outlets, such as Facebook, Twitter, Reddit, and WordPress help spread the word about the new product's launch. Kickstarter, IndieGogo, and Quirky allow for crowdsourcing and crowdfunding so the community can contribute to the idea's creation and fund its production. Finally, Paypal, Google Checkout, and Square make it easier for the amateur entrepreneur to receive payment from the sale of his or her new product offering.

ENTREPRENEURSHIP CAN HELP REBUILD A RECESSED ECONOMY
Seeing the importance of entrepreneurship to help a struggling economy, the United States Congress and President Obama passed several laws intended to aid entrepreneurs and small business owners. These include the Middle Class Relief and Job Creation Act and the Jumpstart Our Business Startups (JOBS) Act. The United States government also began the Startup America initiative, the Startup America Partnership, and BusinessUSA, all aimed at connecting entrepreneurs with private and federal resources to help launch their startup businesses (Obama, 2012).

Another provision set in place by the United States government is the Leahy-Smith America Invents Act, which changes the patent system from a "First to Invent" model to a "First Inventor to File" model. This act was implemented on March 15, 2013. While it can be argued whether this change helps or harms startup businesses, there is one provision of the bill which certainly can help: micro-entity status. Inventors who make less than 3 times the national median household income and have filed less than 4 non-provisional patents can apply for micro-entity status when filing a patent, discounting the patent filing fee by 75% (Leahy-Smith America Invents Act, 2013). This discount can help an entrepreneur protect his or her intellectual property without a large up-front investment, potentially leading to more business startups.

IMPLEMENTATION IS THE KEY TO MAKING A DIFFERENCE

When Reverend Edward Sorin, C.S.C. founded the University of Notre Dame in 1842, he declared, "This college will be one of the most powerful means for doing good in this country (University of Notre Dame)." At present, Notre Dame industrial and graphic design students are inspired to solve problems that make a real difference in this world, whether that is solving Xenophobia in South Africa, improving education for visual-spatial thinkers and those with dyslexia, ending Lymphatic Filariasis in Haiti, combating the global water crisis, or creating local jobs for the recessed South Bend economy (Figure 1).

Figure 1. Kevin Melichiorri's South Bend Collective uses local reclaim material to create fashionable products.

The students are also trained to innovate on that inspiration. They learn how to do frame a problem, analyze the issues surrounding that problem, ideate through prototypes, and eventually refine the concepts to a viable solution. However, these concepts, no matter how brilliant they are, only make an impact if they are implemented. Students have an opportunity that most professional designers do not; they have the chance to work on self-directed social design projects. The most important thing that educators can do is to identify these projects with promise, and to help the students unleash the potential. This is sometimes a difficult area for educators to navigate, as they are either too focused on honing the students' technical skills, or they do not have the entrepreneurial experience to offer pertinent advice.

ENTREPRENEURSHIP EMPOWERS STUDENTS

Once industrial design students graduate and become professionals, it becomes more difficult for them to own the intellectual property they create, as it is typically signed over to their employer. For some students, their undergraduate career may be the only time for them to invent, patent, and either license or take a product to market themselves. Students create intellectual property all the time; it is only prudent to empower these students with the knowledge and ability to own the ideas they create.

HOW ARE WE ENCOURAGING ENTREPRENEURSHIP AT THE UNIVERSITY OF NOTRE DAME?

Over the past year, there are several ways that the faculty at University of Notre Dame has tried to encourage entrepreneurship within the industrial and graphic design community. These include: participating in entrepreneurship themselves, connecting the students to experts who can help startups, implementing entrepreneurship in the curriculum, and upgrading the model shop facilities to include rapid prototyping equipment.

LEADING BY EXAMPLE
The best way to encourage entrepreneurship is to lead by example. At the University of Notre Dame, most of our industrial design faculty have either licensed a product, owned a business or managed a charity. Professor Paul Down co-founded Prodesign, a company that manufactured Jet Wave, the first jet-driven human-powered watercraft. Professor Ann-Marie Conrado co-founded the Hope Foundation, a nonprofit organization that provides education to poor communities in Nepal. Additionally, Postdoctoral Research Associate Michael Elwell has licensed his patent for a prescription bottle opener and magnifying lens to Jokari, Inc. where it is sold at the Magnifying Medi-Grip. Michael also has experiencing launching Kickstarter campaigns, including *Big Bracket*, which launched in March 2013, and *Hexed*, which is set to launch in summer 2013.

The students have followed suit. Kevin Melchiorri, a MFA candidate, started the South Bend Collective, a company that repurposes reclaim material from local recreational vehicle factories to make fashionable clothing and products. Kevin is also designing Pharos, a motion-capture device and social media platform for extreme sport enthusiasts. Breanna Stachowski (Figure 2.) designed and patented a high chair concept that won third place in the International Housewares Association Student Design Competition. Daniel Sunoh Choe runs a website where he sculpts, molds, and sells action figures. Bobby Reichle will soon launch his first of two Kickstarter campaigns, the first for a witty coaster set that includes alcoholic beverage instructions, and the second for Sharkie, and shark-shaped cap for the Sharpie marker. It is unclear how successful these projects will become, but it has been encouraging to see their enthusiasm for the potential.

Figure 2. Breanna Stachowski's Neat Seat

BUILDING CONNECTIONS ON CAMPUS AND WITHIN THE COMMUNITY
It has been important that we build relationships around campus. Not only has this helped our faculty and students to protect their intellectual property, but it has also improved our reputation on campus. Two organizations in particular have been beneficial: the McCloskey Business Plan Competition and the Intellectual Property and Entrepreneurship Clinic.

The McCloskey Business Plan Competition is part of the Mendoza College of Business, named the nation's top undergraduate business school four straight years (Gloeckler, 2013). The competition offers nearly $300,000 in cash and prizes for business ventures. In the 2013 competition, Postdoctoral Research Associate Michael Elwell designed an interchangeable eyewear system for a startup named *Framerie* (Figure 3.)*,* which won $17,000 in cash and prizes, as well as space at the Brandery, a startup accelerator in Cincinnati, Ohio. In the fall of 2013, MFA candidate Kevin Melchiorri plans to partner with engineering and business students to enter his Pharos device in this competition.

Figure 3. Framerie Interchangeable Eyewear System

The Intellectual Property and Entrepreneurship Clinic, part of the Notre Dame Law School has also been a tremendous help. Founded in 2012 by Professor Jodi Clifford, the IP Clinic gives young patent lawyers valuable experience, while offering legal counsel to professors, students, and local entrepreneurs. The IP Clinic has been especially helpful to the design program because the design students and faculty have produced relatively simple and straightforward innovations that these lawyers-in-training can handle. During the 2012-2013 school year, student Breanna Stachowski patented her high chair concept (Figure 2.) and Postdoctoral Research Associate Michael Elwell patented a design for a board game (Figure 4).

Figure 4. Postdoctoral Research Associate Michael Elwell's Hexed board game

IMPLEMENTING ENTREPRENEURSHIP INTO THE CURRICULUM
In the spring semester of 2013, Paul Down's Collaborative Product Development course was altered to develop untapped student intellectual property. Typically, this cross-disciplinary course which includes designers, engineers, architects, anthropologists, scientists, MBA and law students completes an industry-sponsored project. However, the industry-sponsored component was replaced with team-driven entrepreneurial projects. Students pitched entrepreneurial ideas to the class, who voted on which projects

continued. Then, students were paired into four teams, based on where their specific skill sets were needed. Over the course of the semester, the students designed a rack system for storing and locking long boards, a cloud-based design collaboration hub, automobile trunk storage tailgating solutions, and a garbage can that eases the removal of heavy bags (Figure 5).

Figure 5. Rapid prototype of garbage can concept.

NEW FACILITIES AND CAPABILITIES

One major transition for the design program has been locational. Formerly located in the Riley Hall of Art and Design, the graphic and industrial design programs moved to a newly renovated space in the summer of 2012. While this move has made collaboration with the Notre Dame studio art faculty more difficult, the increased space and capabilities have been tremendously beneficial. Specifically, the new model shop is approximately 600% larger, and has rapid prototyping equipment such as a Universal Systems laser cutter, a ShopBot CNC Router, and a MakerBot Replicator 2 3D printer. These new machines allow the students to more quickly iterate, and to even manufacture in small batches. Previously, the design program had to seek assistance from the College of Engineering or the Innovation Park business incubator whenever rapid prototypes were needed. Having these capabilities in-house has increased productivity and reproducibility, while allowing students to work at their own pace.

Figure 6. West Lake Hall Model Shop at the University of Notre Dame

WHAT MUST WE DO BETTER?

While significant improvements have been made to encouraging entrepreneurship within the last year, there is still much more that can be done. First, the design program can find new ways to leverage crowdfunding platforms such as Kickstarter and crowdsourcing platforms such as Quirky. Second, the program must conduct a study into programs that have exceptionally integrated design, engineering, and business. Third, the program must find new and enticing ways of integrating entrepreneurship into its curriculum.

A CURATED KICKSTARTER PAGE

Kickstarter is a crowdfunding platform for creative projects. Since its launch in 2009, more than 4.2 million people have pledged over $658 million dollars, and have funded more than 43,000 projects (Kickstarter, 2013). Many design schools and communities have curated Kickstarter pages, where they feature potential projects and products. These schools include:

- Rhode Island School of Design

- Savannah College of Art and Design

- Minneapolis College of Art and Design

- Stanford Design Program

- California College of the Arts

- Parsons The New School for Design

- Columbia College Chicago

- School of Visual Arts

- MIT Media Lab

- Maryland Institute College of Art

- University of the Arts

- Art Center College of Design

- School of the Museum of Fine Arts Boston

- California Institute of the Arts

- Pratt Institute

- Massachusetts College of Art and Design

- College for Creative Studies

The industrial design program at the University of Notre Dame must find ways to leverage new crowdfunding and crowdsourcing platforms if it wants to stay relevant with industry trends. The first step is to start a curated Kickstarter page. Such a move will require the consent of General Counsel, but will give the Department of Art, Art History & Design program a national stage to exhibit exceptional student work.

LEARNING FROM OTHER PROGRAMS

There is much that the University of Notre Dame Department of Art, Art History & Design can learn from other exceptional programs.

- The Hasso Plattner Institute of Design at Stanford is exceptional at integrating creative from design, engineering, industry, medicine/biology, business, social science, and education (Stanford University Institute of Design, 2013). Following the IDEO model, they are essentially building "smart teams (Brown, 2009)."

- The Segal Design Institute at Northwestern University offers a course called Design Thinking and Communication. It is team-taught by design, engineering, applied science, and writing program

faculty. Additionally, Dr. Elizabeth Gerber and the Creative Action Lab is developing tools to help novice entrepreneurs and innovators launch their products on crowdfunding sites such as Kickstarter, IndieGoGo, and RocketHub (Segal Design Institute, 2012).

- The California College of the Arts offers a MBA in Design Strategy. It is a program that prepares innovators to create products and services that are "not only profitable, but also sustainable, ethical, and truly meaningful (California College of the Arts, 2013).

INSTITUTING A DEDICATED DESIGN ENTREPRENEURSHIP COURSE
While briefly implementing entrepreneurship into the curriculum through the Collaborative Product Development course, there is potential for a permanent design entrepreneurship course at the University of Notre Dame. Students would learn the basics of intellectual property, incorporating, crowdfunding, crowdsourcing, and within the semester launch a campaign on Kickstarter.com. A course like this would not only be available to design students, but anyone at the university that is interested in starting a creative venture.

CONCLUSION

Over the last year, the industrial design program at the University of Notre Dame has made remarkable steps towards implementing a culture of entrepreneurship into its traditional design program. It has improved its facilities and capabilities, patented intellectual property, added an entrepreneurial component to a cross-disciplinary course, and has bridged areas of campus to connect the design students with engineering, business, and law students/faculty. The results have been both rewarding and encouraging. However, there is still much work to be done. If the industrial design program wants to be seen as a leader and pioneer in academia, it needs to quickly adapt to changing business practices and find ways to leverage social media, crowdsourcing and crowdfunding platforms. These are skills that the students can add to their industrial designer toolkit which will complement and enhance their traditional design skills such as sketching, rendering, prototyping, and digital surface and solid modeling. Perhaps most importantly, entrepreneurship is the best way for students at the University of Notre Dame to make their concepts a reality, and make a positive impact on society.

REFERENCES

Anderson, C. (2012) Makers: The New Industrial Revolution. New York NY: Crown Business.

Anderson, C. (2008) The Long Tail: Why the Future of Business is Selling Less of More. New York, NY: Hyperion.

Brown, T. (2009) Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation. New York, NY: Harper Collins Publishers.

"California College of the Arts." (2013) "A New Kind of Business Program: Master the Tools to Make Change and Move Beyond Profit." cca.edu. California College of the Arts. Web. 14 June 2013.

Gloeckler, G. (2013) "Notre Dame's Mendoza Takes No. 1 Ranking, Again." businessweek.com. Bloomberg Businessweek. Web. 14 June 2013.

"Kickstarter." (2013) "What is Kickstarter?." kickstarter.com. Kickstarter, Inc. Web. 14 June 2013.

"Leahy-Smith America Invents Act." (2013) Wikipedia: The Free Encyclopedia. Wikimedia Foundation, Inc. Web. 14 June 2013.

Obama, B. (2012) "Presidental Proclamation- National Entrepreneurship Month, 2012." whitehouse.gov. The White House. Web. 14 June 2013.

"Segal Design Institute." (2012) " Creative Action Lab Launches Kickstarter Campaign to Develop Crowdfunding Tools." segal.northwestern.edu. Robert R. McCormick School of Engineering and Applied Science, Northwestern University. Web. 14 June 2013.

"Stanford University Institute of Design." (2013) "Radical Collaboration" dschool.stanford.edu. Stanford University Institute of Design. Web. 14 June 2013.

"University of Notre Dame." (2013) nd.edu. University of Notre Dame. Web. 14 June 2013.