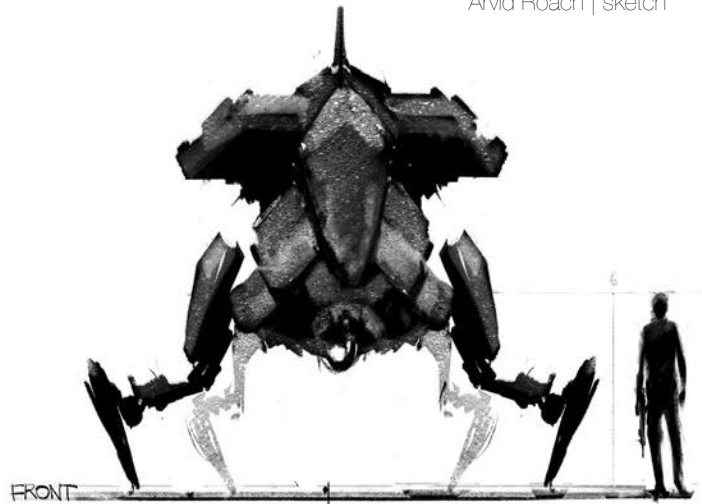


Development of a New Design Program | Drexel University

Background:

To be entrusted with developing a design program from the ground up, may very well be a once in a lifetime opportunity. In any case it is surely a very rare event. Daunting as it was to start with a clean sheet of paper, I had the opportunity to rethink how designers come into being and what our value is to others. With the trust of the University, I decided to take the approach of developing the program not as an educator but as a designer; using the design process to rethink design education, rather than assuming and implementing a traditional pedagogy of what constitutes a design program. The process that I used is one I developed while pursuing my Master of Fine Art in Design Education at The Ohio State University under the mentorship of Jim Kaufman. The focus of Jim's research, and now mine, is "design for non-designers". I developed a class as part of my MFA research that was not surprisingly called: Design For Non-Designers. It was open to all non-design majors at OSU and quickly became a very popular class. As an outcome of this course and my MFA research, a new perception-based workflow was conceived. While informed by a traditional multiphase design process, the new workflow emphasizes the development of novel ideas over a trajectory to a commercializable product. An explanation and evidence of this idea-based design process is addressed in the section: Development of a New Text on Design. In short, this process was used to structure the framework and test the implementation of the product design program. The description of developing the program at Drexel will follow.

Arid Roach | sketch



Also influential in the development of the program is the experience I have gained from being a practitioner and educator of product design. Through professional practice I have experience in the capacity of a corporate designer; a consultant design manager; a design entrepreneur; as well as an occasional a freelance designer. As an educator, I have experienced the academic and preparatory methodologies of three separate institutions. The combination of these experiences has unequivocally formed my reality of what it means to be and become a product designer, thus steering my decision-making and informing my philosophy of how a program should be structured. The key is to eliminate the bias in the opinions gained through this experience. In this case, it is the reality of students wanting to become designers and those who will gain value from young designers fresh out of school. We know from experience the user can provide good insight into the current state of the reality of a product or system, but less vision on where it is heading. In this case it is the intention of the program to attract a wider audience. This new audience I describe as the non-traditional design student. For Drexel, this is indicative of a student who describes him or herself as "a math and science kid" who rejects the obvious path and wants something more creative, rather than a student who has an art experience or sees themselves as creative in high school. In rounding out the reality, observing the user in this scenario proved to be difficult, but with multiple years of teaching experience at The Ohio State, Savannah College of Art and Design and one year at Georgia Tech, what resonated with the students at each institution was well understood.

The final personal influence that shaped the program's creation is that of my own design education. I received my B.S In Industrial Design from University of Cincinnati in 1978 and an MFA from The Ohio State in 2003. I had the good fortune to be educated by and collaborate with some excellent teachers and mentors at two highly ranked institutions. Cincinnati in the late 70's was run by Professor Gill Born and at the time was more reminiscent of a Basel design education than a Bauhaus

04 Ideation

Concepts

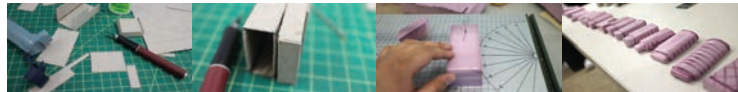


After synthesizing my research I went to the drawing board. I sketched countless concepts that solved one or more of my pre-set design criteria. These concepts that ranged from wearable inhalers to bionic lungs, while creating concepts I made sure to include "Steps", "Jumps", and "Leaps" to make sure I hit all points. After many iterations, I fused together different ideas and landed on a connected inhaler.

Designs



Once I figured out what I was designing, I still had a lot more work to do. -I mocked up many foam and cardboard models to test and get feedback from. Once I figured out the size and mechanism I went back to my "Every Day Carry" research for aesthetic inspiration.



PROJECT BREATHE | PHASE TWO

OSMAN CUETO



pedagogy of design education. Certainly no one is educated in design without some influence of the Bauhaus, and Cincinnati was no exception, as their foundations and formal approach to formgiving, with the emphasis on development of visual design language and its grammar, were textbook Bauhaus. Nonetheless, Cincinnati went deeper, and their education instilled in us a process of formal discovery conducive to the contextual application of design and critical thinking to specific user needs. It also instilled a studio experience that endorsed form-making as a structure for knowledge production. Ideas arise from the act of making and manipulating visual form. Critiques provide intellectual discourse and

perceptual rigor; or as I like to call it, learning through struggle, pain and rejection, an excellent foundation for the real world.

My pursuit of an MFA came later in my career, at OSU. With a solid design career behind me, the program afforded me the ability to select coursework from the university at large and gave me a connection to the "ologies," finding meaning and reason in sociology, psychology and philosophy through the lens of design. My thesis advisor Professor Jim Kaufman introduced me to the concept of design for non-designers, something that came naturally to me with my background and experience and solidified my new path as an educator. The chance to reflect during my MFA also meant I could rediscover what I loved about being a designer; I have come to understand that I am a "path designer": I love the journey from the unknown to the creation of an appropriate yet novel solution. Once a solution is found I am ready for my next journey. Thus ideology and opinion were woven into crafting the pedagogy of the program.

To summarize, the insights gained from experiences that were influential in the formation of the program's personality are as follows:

What I gained from my career as a practicing designer is an understanding that designers "sell faith". To achieve design success we must gain the trust of the people we work for and with. We must instill in ourselves and others a confidence in our ability to innovate and find the unique yet appropriate solutions to complex problems. To achieve these solutions very few designers work alone. We depend on others to champion the decisions we make for the end user, often pushing our colleagues to work past their own comfort zone to goals for which they are not rewarded. The effect of this is that the difference between good design and great design is as much about motivation and facilitation of others as it is creating the perfect sketch. A hard lesson for any designer to learn is that design is not always self-evident. I have experienced that a design process is at its best when a designer has time to explore a rich and meandering journey. We see this in the fact that good design is on the surface, but great design is in depth. It is a depth that comes from sustained thinking and a pursuit of achieving a philosophy such as Eva Zeisel's "Playful search for beauty" or Dieter Rams' lifelong pursuit of creating a "mathematical logic of simplicity". Design, to survive in a commerce driven world, is forced to be efficient, repeatable, and meet client demands as well as represent the needs of the user. While designers have gotten good at the development of efficiency, it at times comes at the cost of deep dives, side projects and the kind of creative recharging that fuels innovation. Over the past few years firms like Pensa have launched their own products, and others have tried to fuel growth through Kickstarter like MINIMAL, but most firms have turned to blogging to try to attract clients over developing rich exploratory labs to create new knowledge. It is also an opportunity for design programs to become applied design labs. Schools like CIID in Copenhagen are leading this charge. I see this as an opportunity to grow the Drexel program into such a lab.

An inspiration for the development of the program comes from researching innovation through the experimentation popping up in industries outside of product design such as high cuisine. Multiple chefs like René Redzepi at Noma, Grant Achatz at Alinea and, more recently, Sean Brock at Husk support experimental labs and are playing with ingredients in new ways like

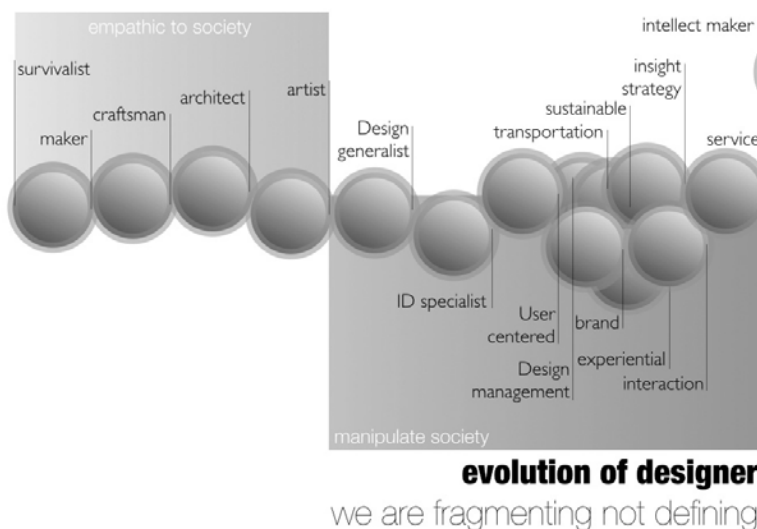
fermenting ingredients and working with local farmers to develop new artisanal crops. It is reminiscent of the one of the most brilliant design talks I've attended by Alberto Alessi who sees his company as a "research lab in the applied arts". In the talk, Alberto espoused a theory of borderlines that speaks to where design should live: straddling the divide between the areas of "possible" and "not possible." The area of the possible is represented by those projects that final customers will be ready to understand, to wish for, to love, and maybe to buy. The area of the not possible is represented by new projects people are not able to understand. The key is you must cross the line between "possible" and "not possible" every now and then to find out where the borderline exists. Alberto calls these his fiascos. Design education should be a journey in fiascos.

“Revel in your glorious failures. Dance on the borderline between success and disaster. Because that’s where your next idea will come from.”

- Alberto Alessi

This leads me to my final insight from my days of managing design at Ignition in Plano, Texas. It is the feeling that the system of value (fee-based design) that our design predecessors have left us has not served us well in today's market. Design that trades on execution and not on the value of our creation has made others wealthy. It hands over our IP to those who don't appreciate it and have squandered our value. We understand that this model is broken and that we must learn how to keep or own value. This is what drives my desire to educate: to take our value back or at least choose with whom we want to share it.

What I learned from being an educator is that preparing young designers for a career is really difficult when you consider everything they are expected to know and master with little time to become proficient. This is a challenge for all design programs. The diversity of process that is taught at many institutions in America is frankly commodified for industries that no longer exist. The firms, clients and companies that want design services no longer have the patience to groom young designers into professionals. The apprentice model that existed in the early decades of design that served to mature designers into masters is extinct. Every designer is expected to be immediately billable (even interns and co-ops), creating a barrier for recent graduates to get a foothold in a competitive and shrinking market. Yet more and more students are interested in the allure of design and want to understand and possess its value. Enrollments, while flat at some institutions, have started to grow in newer



Graphic from a 2010 presentation to frog design and smart design on the future of design thinking and the first use of term "intellectual maker"

programs and specialty areas such as interaction design. New programs continue to be launched as smaller colleges seek to attract students looking to be creative. Growth has been also seen in the addition of graduate programs over the past decade offering to keep students longer to mature, or offering struggling professionals the opportunity for growth, with degrees in Design Management, Design Methods, Transdisciplinary Design and Design Thinking.

I discovered during my research and through experience with the programs with which I have been affiliated that there is a tendency to react to changing market drivers and flat enrollment by offering students a growing list of tracks or concentrations that guide students to

specialize in one of several design focuses, such as service design, interaction design, or design for sustainability. While this is a good strategy for growing enrollment and good for students who need guidance in where to apply design, the long term ramifications of this strategy will need to be measured, for it has started a chain reaction of micro-fracturing the field of design. This has the risk of diluting an already young and fluid profession. It also makes it difficult to create what I believe is an important part of design education, "instilling the soul of a designer". The soul is the core or the golden nugget of what it means to be a designer. In the educational model of product design at Drexel it is the core that is portable. The process involves

instilling the core then applying the focus based on a student's affinity or passion. In closing I have learned and experienced that a lot of faculty can teach students but there only a rare few who can get students to go past mere satisfactory performance to truly excelling. Drexel's program seeks to attract these rare few to build our community,

From here I started with a question:

The Question

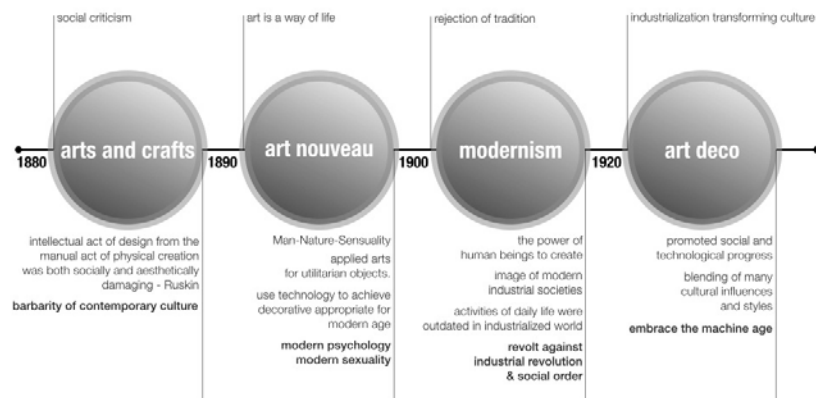
Q: "How do we educate the students who will be designers in 2020 and beyond to be relevant if we don't know what future holds in the way of opportunity, problems and how designers will be solving them?"

A: My conclusion at the end of a two year journey: teach them to be intellectual makers with an entrepreneurial spirit.

The Reality: Research

Design History:

Program development started with a fresh examination of design movements over the past 150 years, plotting cultural and philosophical drivers of each movement rather than technological or aesthetic attributes of any era. The question is, "How did we get here?" Having taught the history of design several times at different institutions, examining the work of some of my favorite movements like Italian Futurism and designers like Joe Columbo, is always inspiring. Yet I have never taken the time to deeply examine how societal signals forged designers' philosophies and informed the resulting work as an interplay of cause and effect to stimulus and reaction of the human condition. What resonates for program development is the philosophy of designers between 1850's and the early 20th century. Designers who made an impact understood and



Graphic and takeaways of the 4 design movements researched and considered influential in developing the Product Design Program at Drexel

responded to societal and human needs by defending humanity when it was threatened and exulted mankind when it achieved. Driven by a desire to nurture humanism in the early movements of Arts and Craft and Art Nouveau, insight could be seen in the decisions that designers made on craft, production and aesthetics and ornamentation. With admiration of cause, it struck me how eloquently critics such as John Ruskin extolled the virtue of the designer and how well designers

like William Morris responded to their cries. Ruskin understood that the intellectual act of design, if separated from the manual act of physical creation, damaged both society and aesthetics. Illuminated by this, I see that the evolution of the designer from craftsman was born out of developing a "voice," not only expressing themselves through their work, but adapting the work to reflect the discourse of their beliefs and writings. What separates a designer from a craftsman was a movement to intellectual maker. With this new found voice and the intention of the deliberate creation of goods with a purpose, design was no longer neutral. I support this contention by contrasting Modernism and American Art Deco. We see the lack of a neutral voice in America using Art Deco to exert power and might, flexing our decorative muscle during America's economic boom after the war. In Art Deco we see design and architecture used as much for propaganda as function. For the Modernist movements again we see an absence to neutrality rejecting the mores of the bourgeois and the lust for enlightenment the industrial revolution brought, questioning these tenants modernist reacted in an equal and opposite force, exposing the absurdity through parity, shock and abstraction. In short, until the end of the Bauhaus designers served as a bridge between humans and society acting as a mouthpiece for humanity rather than a manipulator of human

desire as they are today. Great design minds like Christopher Dresser were eloquent in all forms of thought, and instrumental in the Aesthetic Movement in search of a moral design vocabulary. In contrast, Eliot Noyes, who championed corporate design with the IBM Selectric, had a design philosophy and aesthetic that were driven by the principle that good design was good for the bottom line. The moment to reexamine the history of design above any other single activity in my quest to create a program has had the most profound effect on crafting the intent behind a new program. It inspired me to envision a program focused on giving designers a voice, insisting on critical thinking, and of designing to a philosophy.

Drexel University:

Drexel is a comprehensive global research university ranked among the top 100 in the nation. With approximately 26,000 students, Drexel is one of America's 15 largest private universities. Drexel also ranked seventh among national universities in the U.S. News and World Reports' list of "Up-and-Comers," those schools most often cited by university administrators nationwide as making "the most promising and innovative changes in the areas of academics, faculty, student life, campus, or facilities." Drexel has been in the top 10 each of the six years this list has been published. Throughout Drexel's history its core mission has stayed the same as when it was founded in 1891, when Drexel was praised as a new institution for preparing students for jobs in science and industry, as opposed to training lawyers and academics in abstract fields.

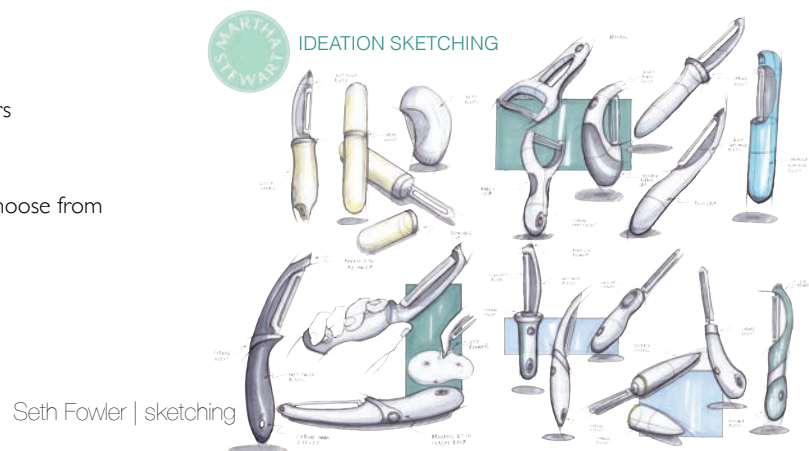
Drexel presented a very unique and fertile environment in which to develop the program. The Antoinette Westphal College of Media Arts & Design has an excellent reputation in Graphic Design, Fashion Design, Interior Design and Digital Media, and also offers degrees in photography, architecture, design and merchandising as well the music industry and arts and entertainment management. Yet for some unknown reason they had not created a product design program until I came onboard in 2008. It was my objective to make the product design program appropriate to Drexel's personality. It would need to be tailored to the strengths of and take advantage of the very thing that makes Drexel unique. To get an understanding of the reality of Drexel, I met with faculty and administrators from every college to discuss each college's mission, entertain stories of Drexel's and the program's history, and collect opinions on the strengths and weaknesses of the University. In return, I pitched the product design program and brainstormed recommendations on classes that students could take to mutually benefit our programs. The big coup was an agreement that allowed product design students to take classes from each of Drexel's colleges.

The List:

- Applied Education focused on careers
- Co-op experience
- Drexel offers over 100+ minors to choose from
- Baidada Institute for Entrepreneurship
- Competition funding
- Free legal and patent help
-

Design Education:

A 2010 Career Index survey listed 64 accredited industrial design programs in the United States graduating approximate 1,600 students, up 22% from 2006. SWOT analysis of 2-local industrial design programs, 2-regional programs, 3-national programs and 1-international program was conducted over a several month period. Data collected included curriculum, degrees offered, students-to-faculty ratio, enrollment, cost of education, co-op, study abroad, etc. The study revealed that the playing field is equal across the board for programs in the US with just subtle differences based on what values the programs emphasize that their education promotes. The core structure was the same and in some cases even shared adjunct professors. Opportunities like study abroad, sponsored projects studios, a heavy shift to CAD and rendering, and a reduction of modeling skills are all very much standard. For Drexel, Co-op is a differentiator; as is the ability to follow an affinity or focus on entrepreneurship.



Seth Fowler | sketching

A survey of regional and local feeder High School students and Guidance Counselors revealed approximately sixty percent of seniors and juniors don't know that industrial design is an option for them, while the other forty percent have heard of industrial design but are unclear about the difference between industrial design and product design. A nice surprise is that of the forty percent of students knowing about industrial design, 25% of them either had a class module or workshop experience in industrial design. More high schools are offering a module on industrial design as part of their curriculum. One more interesting finding of the students that had taken an industrial design workshop at a college or university is that only 2% of the students felt committed to that school. The mix was worse for Guidance Counselors finding that only 6% of the counselors had recommended that a student pursue a career in product design when a student scored high in math and science and only 20% when the student demonstrated artistic aptitude. Students scored higher when having an understanding of entrepreneurship, but low on considering it an option. Exit surveys of students and parents attending our open house sessions for product design scored entrepreneurship opportunities high when informed that Drexel also has funding opportunities for young startups. The six attributes that scored well with visiting families that were seen to be unique to Drexel were:

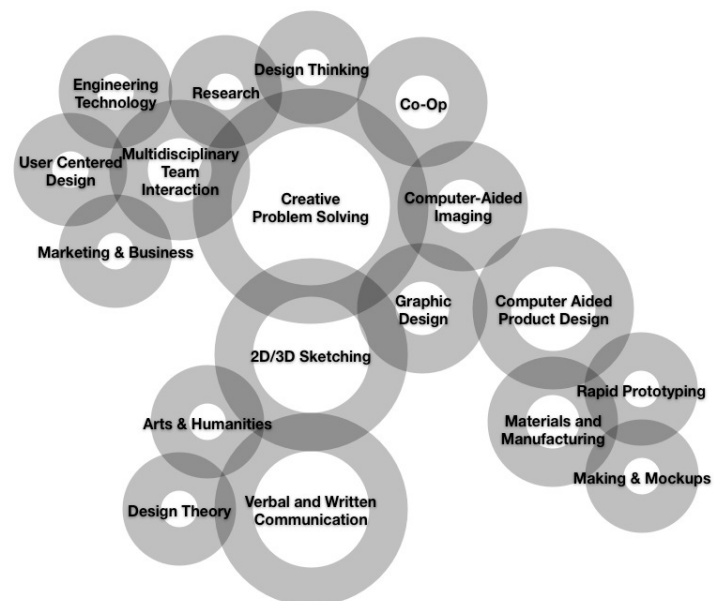
- Co-op
- Self-directed opportunities
- Access to all University courses
- Environment and community
- Entrepreneurship and funding opportunities
- Senior Capstone

Design Market:

The Bureau of Labor Statistics' 2009 edition of Occupational Employment and Wages predicts that the product design profession will grow about as fast as the average for all growth (estimated as 7 to 13%) through 2016. The best job opportunities will be in specialized design firms that are used by manufacturers to design products or parts of products. Designers with strong backgrounds in engineering and computer-aided design coupled with extensive business expertise will have the best prospects. As the demand for design work becomes more consumer-driven, designers who can closely monitor and react to changing customer demands—and who can work with marketing and strategic planning staffs to come up with new products—will also improve their job prospects.

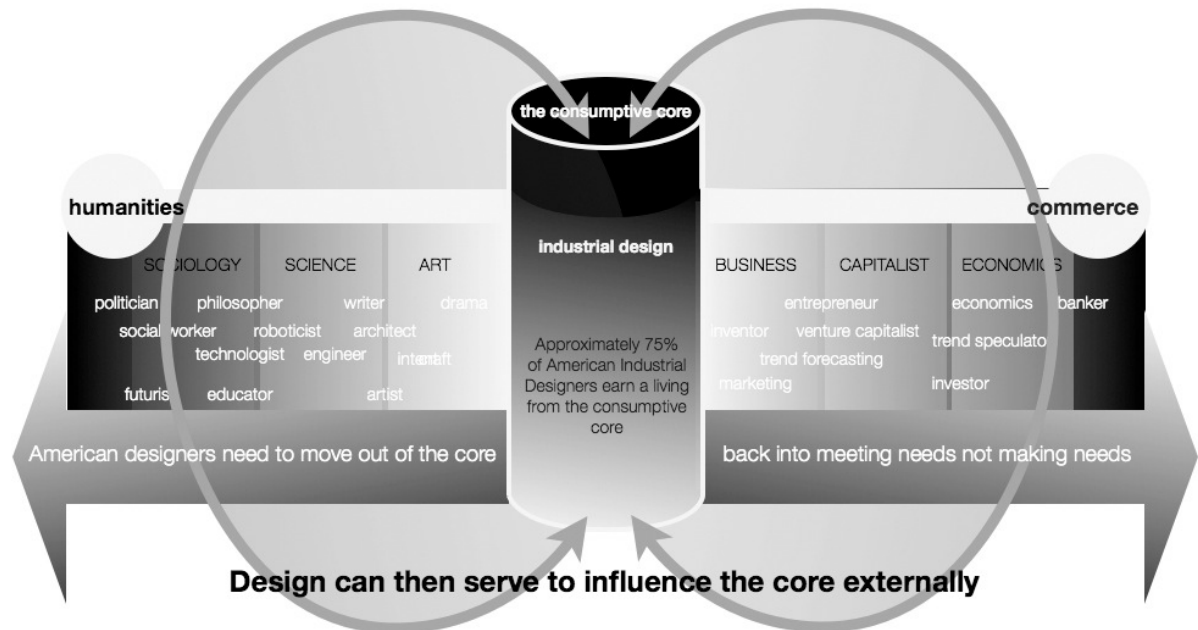
The Bureau of Labor Statistics' 2012 report was even bleaker: Employment of industrial designers is projected to grow 4 percent from 2012 to 2022, slower than the average for all occupations. Consumer demand for new products and new product styles should sustain the demand for industrial designers. Employment in the manufacturing industry is projected to experience a slight decline over the projection period, contributing to the slower than the average growth for industrial designers.

We know intrinsically that we don't need to graduate an abundant stream of traditional designers. Based on the Bureau of Labor Statistics findings we don't need to graduate more than 6-7% of students nationally who are prepared for traditional design job placement. Yet an argument can be made that the global design need is greater than ever. What we do need is designers heading into nontraditional places.



Relative scale of importance and overlap of interrelationship to the top twenty attributes American Design Professional would like a graduating industrial design student to possess. What stands out by looking at this data in graphical form is that after the top three, all other attributes are of equal weight. Adapted from the IDSA survey of 181 design professionals

As a side note, this spring we graduated our first class of 12 product designers. Of the 12 students graduating from Drexel, 5 students or 4% are targeting classic design jobs. The other 8 are entering nontraditional fields or seeking self employment. I believe as a group of educators this is something we should track over the next decade as more programs come online and older programs seek to revamp.



Slide from a 2009 Presentation to Dean Douglas C. Allen | College of Architecture | Georgia Tech by personal invitation to share vision of the future of designers with thought leaders in Atlanta. Graphic describes prediction that as China and emerging countries come on line to fill the needs of the consumptive core american designers will need to move design into non-traditional fields.

Bring together / synthesis

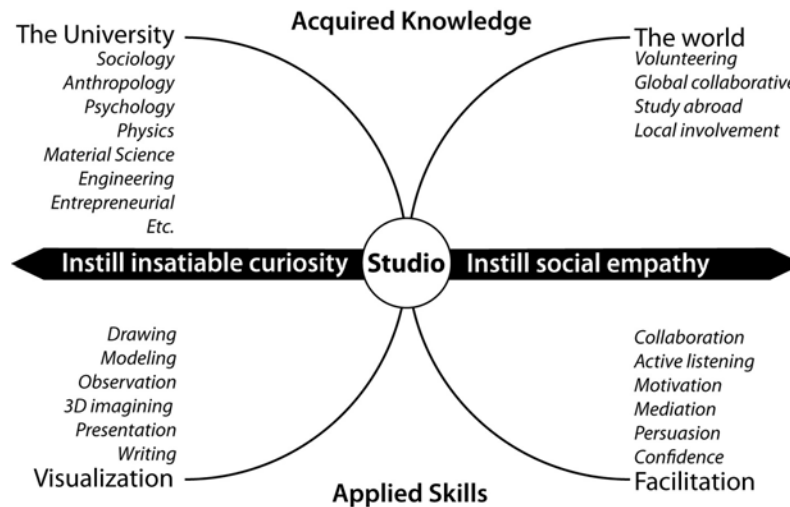
Synthesizing the research conducted around the reality of product design education uncovered in a competitive market revealed that the key to attracting incoming students is to maximize perceived opportunities. As such, students and parents are evaluating programs by the following criteria; placement after graduation, perceived opportunities such as study abroad and internships, focus or concentrations, types of past projects, access to collaborations on and off campus, access to technology, access to tools and space, quality of past student work, and in some cases the cost of the education or assistance received. Not surprisingly this list is driven by two major factors, parents concerns for their child's future and evidence that supports the potential for success. Factors that were low deciding factors were: research and faculty, except when predominately adjunct.

“ There is a difference between being given opportunities and the chance to make opportunities”

- Analysis Insight

With the desire to attract a nontraditional design student, touchpoints were uncovered that resonate with this new phenotype (I'm calling it the “self-guided student”) who comes to a university with ambition and is seeking activation. The theme that came out of analysis is a desire to connect a student's perceived skill either intellectual or physical and/or an expressed deep passion which they are bringing into the program to add creativity or in this case the core being a designer. The theme research uncovered is “there is a difference between being given opportunities and the chance to make opportunities.” This insight led to a breakthrough of understanding that a traditional vocational paradigm does not interest this type of student. The development of a new model of design education would need to be created to service need. Drexel is both uniquely poised to attract students wanting opportunities as listed above

but more importantly able to attract the self-guided student through attributes offered by the university and the program such as: student funding for entrepreneurial endeavors, ability to form companies with students from different majors, opportunities to collaborate in class with students taking the product design minor, selection of over 100 minors to add to design studies, open collaborative communities, and workspace for setting up multidiscipline collaboration.



This diagram visualizes how knowledge, applied skills and interest acquired outside of studio are brought together in studio to instill qualities for novel and appropriate solutions. Studio acts as the lens to synthesize knowledge gained in the world. This is the key to activating design in both traditional and non-traditional design students.

Creating a new reality of education

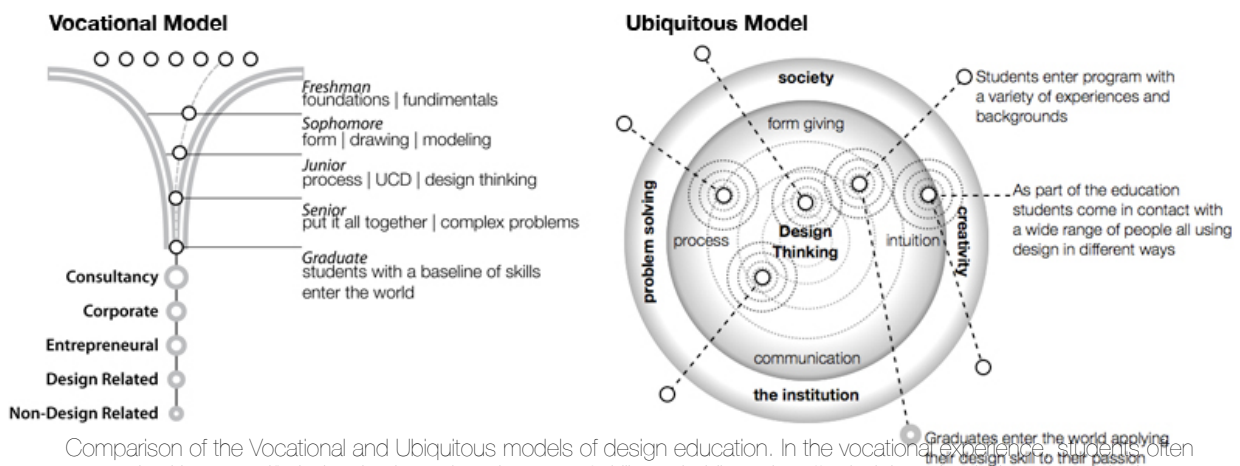
As discovered in synthesis, a new model of design education was needed to address the desire to rethink the traditional methodology and move towards an education model that supported designers as intellectual makers. A breakthrough came when sketching a visualization of what a vocational model of design looked like to me. Each time I sketched a model it would start looking more and more like a funnel: a program takes a diverse set of individuals all entering the program at the same time and then slowly over the course of 4 or 5 years molds each student into carbon copies of the designer that program held up as a standard for their school. Some programs may create better researchers, some better at form, others more conceptual while others more practical. We can sense this occurring, for most designers can rightly or wrongly stereotype students coming out of certain program. When you hire students from various programs you know what to expect, and rightfully so, as it is the goal of every program to try to achieve and maintain a level of constancy to become a reputable program.

I pondered the funnel metaphor for some time while trying to answer several other nagging issues, the first of which was: would product design be a 4 or 5 year program? The decision was a balance of how much co-op experience they would get and ultimately how much time the program had to develop design skills. It was established that in the Drexel System the freshman year was already taken by foundation and Gen Ed. At first this decision was not clear but once I got the metaphor for the new program everything started to fall in place, including how long it should be.

The snap came when staring at my funnel doodles hanging on the wall and thinking, "I'm swimming here," meaning I was getting nowhere fast on how to structure the program. When the new model finally hit me, I thought, "Design programs should not be structured like a funnel but like a pond." The idea of students swimming in a pond solved two major issues I had with the vocational model. One, "Why should everyone come out the same or be judged by one ideal?" and two, "Why do we not embrace the diversity of student experience coming into the program? Why does the funnel look at individuals as empty vessels?" Answers to these would support a more open critical thinking education model.

The pond is visualized in this way: A diverse set of students once accepted into the program enter the studio community from different directions, experiences, and viewpoints. There is no one way to enter the pond. The studio community is represented by the pond. It is comprised of all levels of students in the major: faculty members, minors, invited guests, staff and collaborators all swimming in the same environment. The studio is a large open space that accommodates the entire community. Students are not segregated by level or stratified by the funnel and can come in contact with each other and interact on a daily basis with the entire community, experiencing many ways in which people see, use and experience design. (They bump into each other.) Students learn from and advance each other's skills, critical thinking, and aesthetic eye. As students progress with their education they move from mentee to mentor. At graduation students launch into the world in many different directions.

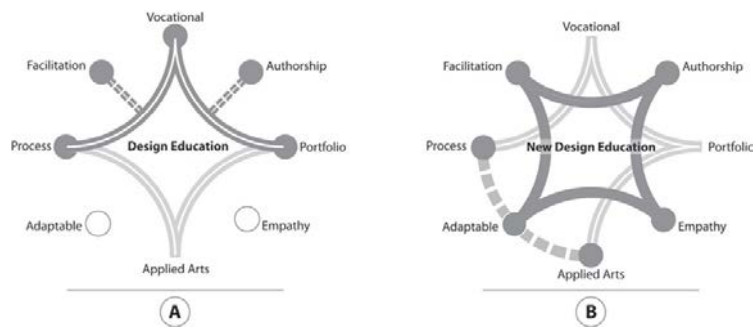
It was right around this time that I attended a design panel at the Cooper Hewitt Museum with Niels Diffrient. He of course shared many lovely insights about design, in a strikingly direct way that made them even more poignant. Two points stood out as confirmation that my intuition was correct and I should lock down the program and run with it. First, Niels shared the thought that the secret to great a great design studio was community first, process second, and outcomes last. I borrowed this directly and implemented the program in just this way. Second, he stated that designers should never use marketing data to make a design decision. This was brilliant, and I cannot do justice to the depth of logic in Niels' explanation, but the paraphrased version is that Marketing's entire existence is to find the largest sweet spot of the market, (think "vanilla") and a designer's role is to capture the needs of the outliers, for this is where you find the solution everyone wants. (think salted caramel). What this meant to me is that I would not develop a "vanilla" program.



Comparison of the Vocational and Ubiquitous models of design education. In the vocational experience, students often get tracked into specific industries based on the sets of skills and philosophy afforded them by their program. In the proposed ubiquitous experience, students navigate among a range of design philosophies and applications, developing their own personal applications of design, while honing a design philosophy and design image. What becomes important in the ubiquitous model is that students find their passion or affinity, using design as a conduit to that passion. Opposite to the vocational model, students graduating from the ubiquitous education have an infinite range of tracks and can bring design value to new industries, markets or society.

At this point the program structure was understood and major questions had been locked down. The program as imagined offers a B.S. degree in Product Design. It is a 4-year curriculum totaling 187 credits and a product design minor being offered at 23 credits. The minor is a critical component to the success of the majors as it is expected to build in collaboration and diversity to the major. In the junior year students participate in a six-month co-op experience. It was expected that in the first year a section of 12 students will be admitted into the program. The enrollment was expected to increase over the next three years, creating sections of 15 students each. By the fourth year the minor will add an additional section of 15 to 18 students. Before locking down the final course selection of existing classes, the development of new classes, and the sequence of a few other details needed to be set. I needed a definition of a product designer as "thinker maker", and I needed to put the program's philosophy to words, and I needed to reimagine the secondary outcomes as part of development. Analysis of secondary touch points grew out of the review of competitive programs. What was found was

that most programs either focus on a portfolio or on a design process. While all schools actually do both, a program will tend to emphasize one over the other; then become known as either a portfolio school, which tends to be more art-based, or a process school, which tend to be more university-based. An aspect of design that has been forsaken by some programs



Two schematics comparing the philosophy of secondary touch points as instilled by the program. Schematic A, shows the standard pedagogical approaches offered by design programs that focus on process and portfolio. Schematic B shows Drexel's program shifts in pedagogy to secondary outcomes of adaptable and empathy, enabling a new primary outcome of a program that is an applied arts-process school.

that focus on vocation is in instilling adaptability in their students and exposure to the humble roots of design as applied arts. While programs will argue that adaptability is inherent in learning a design process and by nature part of a designer's personality, this is not entirely true, especially when students are groomed for a subset of design and considered a specialist and not as a generalist. Programs have also positioned design as a soft science and not an art, while trying to cater to both sides. When designers/students rely on research as a science they tend to trust data over intuition, thus suppressing novel ideas and happy accidents, being afraid to take the

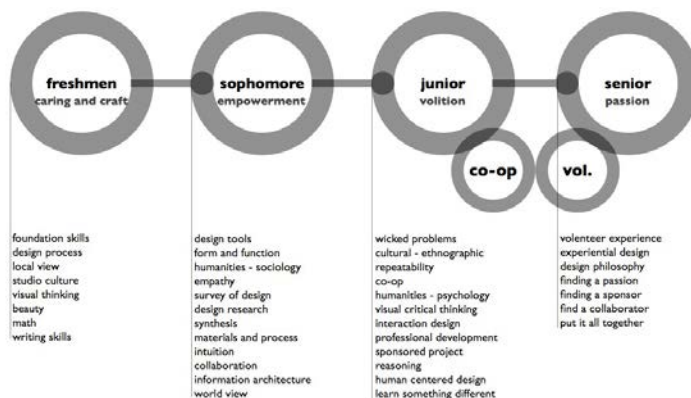
intuitive leap.

Definition of a Thinker Maker:

A thinker maker or intellectual maker is a person who is curious about the world and the people who inhabit it. From a desire to understand the human condition they develop empathy for people they observe and distill meaning from what they experience. Through a design process, critical thinking and making, the thinker maker creates insight from action and wisdom from evaluating those actions. The output of this process compels the thinker maker to create appropriate solutions for a range of human needs from medical devices to education to tableware.

Philosophy of Drexel Product Design:

The Drexel Product Design Program educates students to become product designers as intellectual makers. The goal of the program is to empower bright, ambitious students to possess the soul of design as an intellectual pursuit driven by the desire to create meaning through making. Students will use their ability out into the world driven by their passion to create



An example of one of the early schematics structuring the expected flow of the students educational experience, and timing of pedagogy and learning out comes.

meaningful appropriate solutions to human needs for themselves and others. The program intends to create a new generation of designers as generalists with the core beliefs of empathy, adaptability, humanity, and appropriateness.

The final step was to balance the course load between intellectual/knowledge pursuit and design pursuit. I decided to make it a 50-50 split with half the course work from the university at large and 50 percent newly created design course work. This led to writing syllabi, outcomes and sequences.

There were also still a few bureaucratic forms to fill out, signatures to acquire and the submission of a final program proposal

to Drexel's Senate for university approval. Before that I needed one last step to validate my decision and fine tune the program before submittal to the Drexel senate.

Validate

The Product Design Professional Advisory Committee consisted of the following advisors:

Dan Formosa | Co-Founder, Smart Design

Jon Kolko | Associate Creative Director, frog

Sohrab Vossoughi | Owner, Ziba Design

Allan Chochinov | Partner Core77.com Director of Products of Design SVA

Hung-Hsiang Chen | Director of Industrial Design, Asus Computers

The first question from the review committee was: "Why Product Design instead of Industrial Design?" The answer they accepted is that for Drexel there is the desire to be a program that creates generalist students, so it was the more open and appropriate term.

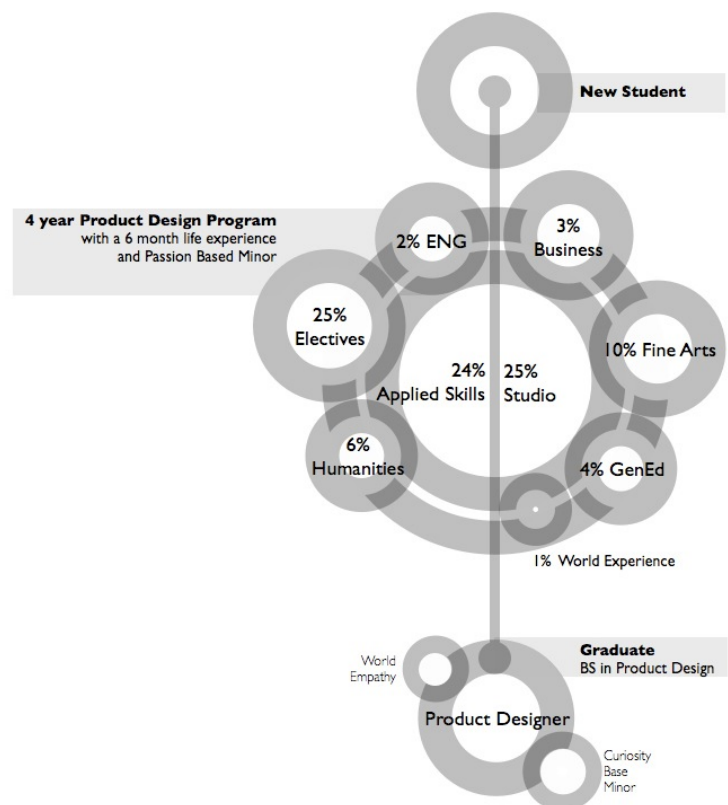
Feedback also came in the form of suggestions that induced refinement and restructuring of the sequence, reordering the timing and emphasis mainly on design research, and portfolio development. Suggestions also came in on structuring the senior sequence to allow more time for exploration.

The committee lauded the emphasis on the core skills of modeling and sketching, and felt that there was an appropriate emphasis on research and critical thinking as well as the final sequence to graduation.

The Launch / reflection

The Bachelor of Science degree in Product Design requires a minimum of 187 quarter credits. In the junior year students participate in a six-month full-time co-operative educational experience. Now in its fourth year, the program has grown in size steadily with numbers adding up to a total of 57 students (12 seniors, 8 juniors, 15 sophomores, and 22 freshmen with 20+ freshmen expected to start in the fall of 2014). For the upcoming years it is planned to have sustained growth in both the number and size of cohorts until a steady-state of 120 students is reached in order to eventually grow to 30 students per year (representing two 15- student sections). The minor in Product Design (currently 15 students) has found widespread attraction across campus with students majoring in Design and Merchandising, Graphic Design, Mechanical Engineering, Biomedical Engineering, and Architecture. It is planned to eventually offer sections only for minors to better cater towards their specific major requirements.

Central to a student's education in Product Design is the studio experience; all other courses serve to build knowledge, broad experience, cultural perspective, and working



Schematic of final course balance showing the influences students receive and the percentages they are exposed to, nearly 20% of the students education is self directed.

skills. These are in turn applied to the studio projects. Because studios are project-based, they are the best way to directly observe and measure student growth. The program has started to develop assessment rubrics to monitor the overall progress and success of the program with mid- and end- capstones. Plans are also in works to have a committee of professionals and academics review the curriculum and outcomes of the graduating students.

A competitive advantage for the program is access to a full university experience for its students. To maximize the value of this resource, fifty percent of the curriculum (82 credits) has been based on already existing courses offered by other colleges at the Drexel University. These courses are expanding the student's knowledge, awareness of multiple perspectives, and overall experience, offering a wide range of diverse opportunities that can provide key learning to augment the designer's worldview. The curriculum allows sufficient free electives (27 credits) to augment the student's individual interests in other subjects or complete a minor.

Fifty credits come from existing courses within AWCōMAD. These provide visual studies, art/design history, digital media and photographic foundations to the Product Design majors. Sixteen new courses (54 credits) were developed as requirements for the major. These are intended to teach students methods and skills specific to the product design profession and to enable them to apply knowledge and skill through the lens of a product design process.

In summary, product design students are required to complete 187 credits:

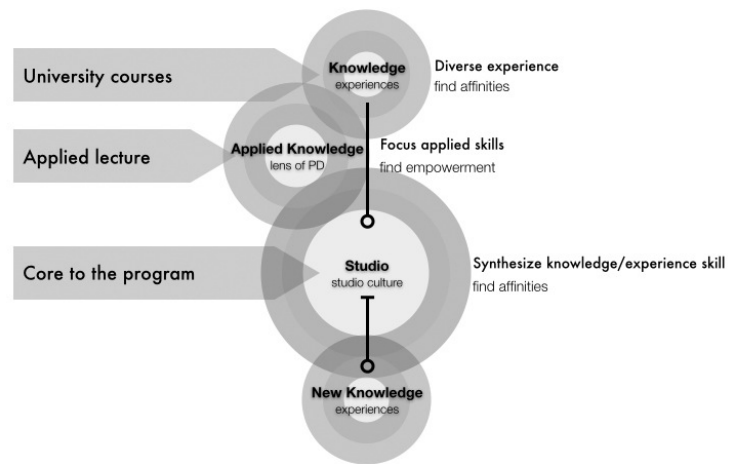
105 credits in Product Design Studio or Related Areas which equals 58% of the total

15 credits in Art and Design History which equals 8% of the total

40 credits in General Studies which equals 22% of the total

38 credits in free electives which equals 20% of the total

Until last year I ran the program single-handedly. Thankfully, last year we completed our first successful tenure-track faculty search and have added Assistant Professor Verena Paepcke-Hjeltness to head up and grow our design research initiative.



Schematic of the strategic plan of the program integrating knowledge, applied skill and studio to activated new knowledge and opportunity in product design.

Product Design BS
Entering Class of 2010 Graduating Class of 2014



Stu

FALL	Winter	Spring	Summer
1st term EXAM 080 Common Exam 0 UNIV 101 University Seminar 1 ENGL 101 Expository Reading and Writing 3 VSST 101 Design I 4 PROD 101 History & Analysis of Prod Des 3 VSST 110 Introductory Drawing 3 Term Credits 14 14	2nd term EXAM 081 Common Exam 0 UNIV 101 University Seminar 1 ENGL 102 Persuasive Reading and Writing 3 VSST 102 Design II 4 ARTH 102 History of Art II 3 DIGM 100 Digital Design Tools 3 Arts and Humanities Elective 3 Term Credits 17 31	3rd term EXAM 080 Common Exam 0 VSST 103 Design II 4 VSST 111 Figure Drawing 3 ENGL 103 Analytical Reading & Writing 3 MATH 101 Introduction to Analysis I 4 ARTH 103 Art History III 3 Term Credits 17 48	Summer Vacation Sketch Book & Reading Assignment Term Credits 15 112
4th term VSCM 240 Typography I 3 PROD 210 Intro to Product Design 3 PROD 205 Applied Making I 3 PROD 235 Applied Design Visualization 3 PHYS 103 General Physics I 4 Term Credits 16 64	5th term PROD 220 Product Design Form Studio 4 VSCM 230 Visual Communication I 4 ECON 201 Economics I 4 One VSST Multimedia 4 VSST 20_ Multimedia: Performance 3 Multimedia: Space 3 Multimedia: materials 3 Term Credits 16 79	6th term ENGR 220 Fundamentals of Materials 4 MEM 201 Foundations of CAD 3 PROD 230 Product Design Process Studio 4 DSMR 201 Analysis of Product 3 CHEM 201 Why Things Work 3 Term Credits 17 96	7th term PROD 245 Seminar Professional Landscape 3 PHTO 110 Photography 3 PROD 255 Applied Materials in Pro Des 3 PROD 225 Computer Aided Imaging in PD 3 Elective 3 Term Credits 15 112
8th term PSY 101 General Psychology 3 PROD 340 Interdisciplinary PROD Studio 4 PHTO 234 Studio Photography 4 Arts and Humanities Elective 3 Elective 3 Term Credits 17 129	9th term PSY 332 Human Factors & Cognitive Psych 3 PROD 345 Applied Human Centered Design 3 COM 220 Qualitative Research Methods 3 Arts and Humanities Elective 3 Elective 3 Term Credits 15 144	Cooperative Experience A Term Credits 13 187	Cooperative Experience B Term Credits 13 187
10th term PROD 460 Research Synthesis Studio 4 ARTH 300 History of Modern Design 3 PROD 425 Applied Design Research 3 Elective 3 Elective 3 Term Credits 16 160	11th term PROD 470 Create Build Studio 4 MGMT 260 Intro to Entrepreneurship 4 Elective 3 Elective 3 Elective 3 Term Credits 14 174	12th term PROD 480 Exhibition Studio 4 PROD 475 Professional Practice PROD 3 Elective 3 Elective 3 Term Credits 13 187	Minimum Credits to Graduate 187

BS/PROD AWC/MAD January/01/2010

Final

Product Design BS
Entering Class of 2010 Graduating Class of 2014



foundations of design

process & skill

professional practice

putting all together

FALL	Winter	Spring	Summer
1st term EXAM 080 Common Exam 0 UNIV 101 University Seminar 1 ENGL 101 Expository Reading and Writing 3 VSST 101 Design I 4 PROD 101 History & Analysis of Prod Des 3 VSST 110 Introductory Drawing 3 Term Credits 14 14	2nd term EXAM 081 Common Exam 0 UNIV 101 University Seminar 1 ENGL 102 Persuasive Reading and Writing 3 VSST 102 Design II 4 ARTH 102 History of Art II 3 DIGM 100 Digital Design Tools 3 Arts and Humanities Elective 3 Term Credits 17 31	3rd term EXAM 080 Common Exam 0 VSST 103 Design II 4 VSST 111 Figure Drawing 3 ENGL 103 Analytical Reading & Writing 3 MATH 101 Introduction to Analysis I 4 ARTH 103 Art History III 3 Term Credits 17 48	Summer Vacation Sketch Book & Reading Assignment Term Credits 15 112
4th term VSCM 240 Typography I 3 PROD 210 Intro to Product Design 3 PROD 205 Applied Making I 3 PROD 235 Applied Design Visualization 3 PHYS 103 General Physics I 4 Term Credits 16 64	5th term PROD 220 Product Design Form Studio 4 VSCM 230 Visual Communication I 4 ECON 201 Economics I 4 One VSST Multimedia 4 VSST 20_ Multimedia: Performance 3 Multimedia: Space 3 Multimedia: materials 3 Term Credits 16 79	6th term ENGR 220 Fundamentals of Materials 4 MEM 201 Foundations of CAD 3 PROD 230 Product Design Process Studio 4 DSMR 201 Analysis of Product 3 CHEM 201 Why Things Work 3 Term Credits 17 96	7th term PROD 245 Seminar Professional Landscape 3 PHTO 110 Photography 3 PROD 255 Applied Materials in Pro Des 3 PROD 225 Computer Aided Imaging in PD 3 Elective 3 Term Credits 15 112
8th term PSY 101 General Psychology 3 PROD 340 Interdisciplinary PROD Studio 4 PHTO 234 Studio Photography 4 Arts and Humanities Elective 3 Elective 3 Term Credits 17 129	9th term PSY 332 Human Factors & Cognitive Psych 3 PROD 345 Applied Human Centered Design 3 COM 220 Qualitative Research Methods 3 Arts and Humanities Elective 3 Elective 3 Term Credits 15 144	Cooperative Experience A Term Credits 13 187	Cooperative Experience B Term Credits 13 187
10th term PROD 460 Research Synthesis Studio 4 ARTH 300 History of Modern Design 3 PROD 425 Applied Design Research 3 Elective 3 Elective 3 Term Credits 16 160	11th term PROD 470 Create Build Studio 4 MGMT 260 Intro to Entrepreneurship 4 Elective 3 Elective 3 Elective 3 Term Credits 14 174	12th term PROD 480 Exhibition Studio 4 PROD 475 Professional Practice PROD 3 Elective 3 Elective 3 Term Credits 13 187	Minimum Credits to Graduate 187

Students sequence chart and strategy of the focused layering building skill and intellect that make up the students four year journey.

Student Course of Study Plan



Product Design Major Sheet (PROD)

Minimum Credits to Graduate 187

Name _____

ID# _____

General Education Requirements: 67cr

Written Analysis and Communication 9cr

ENGL 101	Expository Reading and Writing	3cr	_____
ENGL 102	Persuasive Reading and Writing	3cr	_____
ENGL 103	Analytical Reading & Writing	3cr	_____

Mathematics and Natural Science 11cr

CHEM 201	Why Things Work	3cr	_____
MATH 101	Introduction to Analysis I	4cr	_____
PHYS 103	General Physics I	4cr	_____

Arts and Humanities 9cr

_____	_____	3cr	_____
_____	_____	3cr	_____
_____	_____	3cr	_____

Social Sciences 9cr

ANTH 370	Ethnographic Method	3cr	_____
PSY 101	General Psychology	3cr	_____
PSY 332	Human Factors & Cognitive Psych	3cr	_____

University Requirements 2cr

UNIV 101	The Drexel Experience	1cr	_____
UNIV 101	The Drexel Experience	1cr	_____
COOP 101	Career Mgmt/Profess Dev	0cr	_____

Electives 27cr

1	_____	cr	_____
2	_____	cr	_____
3	_____	cr	_____
4	_____	cr	_____
5	_____	cr	_____
6	_____	cr	_____
7	_____	cr	_____
8	_____	cr	_____
9	_____	cr	_____

PROD Electives

PROD 215	Critical Thinking in PD	_____	_____
PROD 350	Sponsored PROD Studio	_____	_____
PROD 399	Indep Study Product Design	_____	_____
PROD 465	Special Topics PROD	_____	_____

Visual Studies Requirements: 48cr

ARTH 102	History of Art II	3cr	_____
ARTH 103	History of Art III	3cr	_____
ARTH 300	History of Modern Design	3cr	_____
DIGM 100	Digital Design Tools	3cr	_____
PHTO 110	Basic Photography	3cr	_____
PHTO 234	Studio Photography	4cr	_____
VSCM 230	Visual Communication I	4cr	_____
VSCM 240	Typography I	3cr	_____
VSST 101	Design I	4cr	_____
VSST 102	Design II	4cr	_____
VSST 103	Design III	4cr	_____
VSST 110	Introductory Drawing	3cr	_____
VSST 111	Figure Drawing	3cr	_____

Pick One of the Following:

VSST 201	Multimedia: Performance	4cr	_____
VSST 202	Multimedia: Space	4cr	_____
VSST 203	Multimedia: materials	4cr	_____

Product Design Requirements: 72cr

DSMR 201	Analysis of Product	3cr	_____
ECON 201	Principles of Microeconomics	4cr	_____
ENGR 220	Fundamentals of Materials	4cr	_____
MEM 201	Foundations of CAD	3cr	_____
MGMT 260	Intro to Entrepreneurship	4cr	_____
PROD 101	History & Analysis of Prod Des	3cr	_____
PROD 205	Applied Making I	3cr	_____
PROD 210	Intro to Product Design	3cr	_____
PROD 220	Product Design Form Studio	4cr	_____
PROD 225	Computer Aided Imaging in PD	3cr	_____
PROD 230	Product Design Process Studio	4cr	_____
PROD 235	Applied Design Visualization	3cr	_____
PROD 245	Seminar Professional Landscape	3cr	_____
PROD 255	Applied Materials in Pro Des	3cr	_____
PROD 340	Interdisciplinary PROD Studio	4cr	_____
PROD 345	Applied Human Centered Design	3cr	_____
PROD 425	Applied Design Research	3cr	_____
PROD 460	Research Synthesis Studio	4cr	_____
PROD 470	Create Build Studio	4cr	_____
PROD 475	Professional Practice PROD	3cr	_____
PROD 480	Exhibition Studio	4cr	_____

last revision 01|01|10

Entering Class of 2010 | Graduating Class of 2014

Students are required to complete the following courses and electives to earn their B.S in Product design

The first Course Description Sheet



Applied Lecture Courses

PROD 101 History & Analysis of Prod Des

This class studies the chronological context of the development of the product design profession, relating it to the social, cultural and economic events that helped shape our modern day society. Studies are focused on major industrial designers and innovations. This course has both a project and written analysis paper component. **3 credit hours - Lecture**

PROD 205 Applied Making I

This course introduces the development of rapid study models and mid-fidelity prototypes related to product design. Students, through a series of exercises, build study models of products to professional standards of accuracy and finish, with an emphasis on rapid development. Aspects of workshop practice and safety are emphasized. **3 credit hours - Lecture/Lab**

PROD 225 Computer Aided Imaging in PD

An applied computer laboratory in which students pursue the development of design projects using current product design photo realistic rendering software and 3D workstations for design and three dimensional modeling of products applicable to rapid prototyping. **3 credit hours - Lecture**

PROD 235 Applied Design Visualization

This course will provide students with schemas and strategies for using visualization as a thinking tool, as well as persuasive techniques for communicating design intent. It will put into practice the essential techniques that product designers use to think and communicate visually. **3 credit hours - Lecture**

PROD 245 Seminar Professional Landscape

In this course students explore current trends in the product design profession today. Students will research and present insights into important design issues, trends, and criticism in contemporary product design. Through extensive readings and discussions, students develop an understanding of the relationship of product design to society and culture. **3 credit hours - lecture**

PROD 255 Applied Materials in Pro Des

The course emphasizes the practical relationship between product design and the manufacturing industry and the technical considerations that influence the choice of material and process for small batch and mass production. **3 credit hours - lecture**

PROD 345 Applied Human Centered Design

This course explores the physical, psychological, perceptual, and behavioral characteristics of humans. Through a series of lectures and projects, this information is applied to the field of product design to develop safe and effective products. **3 credit hours - lecture**

PROD 425 Applied Design Research

This course covers diverse theories and methods for conducting product design research. Emphasis is given to understanding quantitative and qualitative research methods and the role of the designer in synthesizing and applying research as a critical part of the design process. This course combines writing and short projects. **3 credit hours - Lecture**

PROD 475 Professional Practice PROD

This course provides information about career planning and job seeking, including the development of cover letters, résumés, online and physical portfolios and the interview process. Practicing design professionals serve as guest speakers and conduct mock interviews to address topics relevant to the practice of product design. **3 credit hours - Lecture**

Studio Classes

PROD 210 Intro to Product Design

This course introduces students to basic product design techniques. It combines lectures, demonstrations, discuss design concepts and complete problem solving exercises exploring product design as a creative process in the production of simple objects. Students develop a command of product development, and skills in modeling and communicating their novel solutions. **3 credit hours - Studio**

PROD 220 Product Design Form Studio

This course uses principles of design in the visual organization of physical elements and analysis of form. Building on abstract relationships including additive and subtractive forms as well as gestalt. Students develop a sensitivity to form language, semantics and aesthetics of volumes and synthesize this abstract language into functional objects. **4 credit hours - Lecture/Studio**

Studio Classes - continued

PROD 230 Product Design Process Studio

In this course students are presented complex design issues in mass-produced objects. Students develop an understanding of the product development process focusing on the designers skills and technical knowledge to formulate appropriate design solutions. Students practice collaboration of ideas with engineers, marketing, users and shareholders.

4 credit hours - Lecture/Studio

PROD 340 Interdisciplinary PROD Studio

Through a focused design project, students of various backgrounds and departments collaborate on complex design issues as they seek to create an appropriate and novel solution to the assigned design problem. Bringing both the PROD majors and PROD minors together, students work as teams through the product development cycle.

4 credit hours - Lecture/Studio

PROD 460 Research Synthesis Studio

In this first of two senior studios, students apply their skills to initiate research on an opportunity of their selection. Under supervision, students demonstrate control of applied design research and synthesis. This course focuses on the information gathering, study, and analysis that product designers do to inspire and inform themselves. **4 credit hours - Studio**

PROD 470 Create Build Studio

In this second of two studios, students apply their skills to develop a solution based on the research conducted in the previous studio. Under supervision, students will demonstrate control of the a product design process in the production of a novel and appropriate user-focused solution. **4 credit hours - Studio**

PROD 480 Exhibition Studio

This final studio is a culmination of the educational experience in the production of a senior exhibition highlighting the students' accomplishments. Under supervision, students work together to demonstrate control of all aspects of the design process and visual communication in the production of a graduation exhibition. **4 credit hours - Studio**

PROD Elective Courses

PROD 215 Design Thinking in PROD

This course is a studio-seminar exploring principles and theories of product design, systematic design process, problem solving, decision making and design as authorship. The course uses design research methods, and topical design issues to explore and experience design thinking. **4 credit hours - Studio**

PROD 350 Sponsored PROD Studio

Students undertake projects that are sponsored by industry partners to investigate a broad range of design, marketing and production issues. In this course, students, working in a team environment, research user needs, human factors, aesthetic issues, manufacturing requirements, and market demands to identify user needs and product opportunities.

4 credit hours - Studio

PROD 399 Indep Study Product Design

Provides individualized study in graphic design in a specialized area of study. May be repeated 2 times for credit. Department permission required.

3 credit hours

PROD 465 Special Topics PROD

Provides study in product design on a special topic or on an experimental basis. May be repeated 2 times for credit if topics vary.

4 credit hours - Lecture/Studio

Outcomes /creating opportunities

Attached is a sampling of students work and press:



Google Glass Meets Cyberpunk Light Therapy

TRICK YOUR BRAIN INTO THINKING IT'S SUMMER: LIGHT THERAPY GLASSES TAKE ON SEASONAL AFFECTIVE DISORDER.

0 3 20 71 101 419
NOTES PIN PLUS SHARE TWEET LIKE

Do you feel sadder, fatter?
As many as 10 million people suffer from Seasonal Affective Disorder, a type of depression that occurs during the winter months.

The Light Therapy Glasses, which resemble a pair of cyberpunk goggles, constantly beam light into your eyes, simulating the amount of light you would receive in the summer--even in the dead of winter.

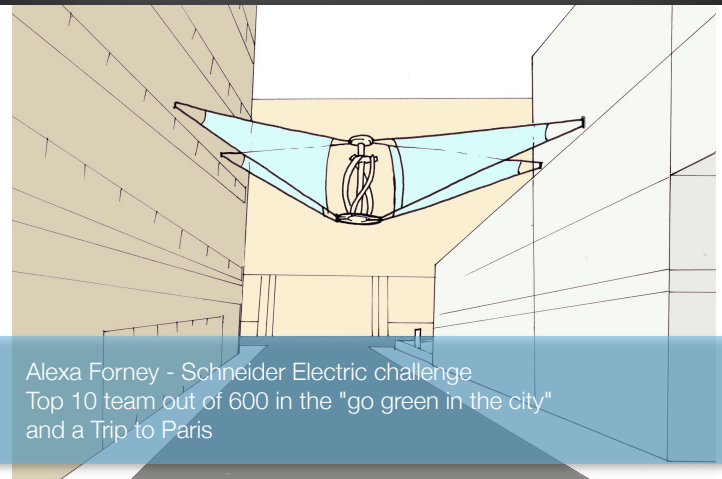
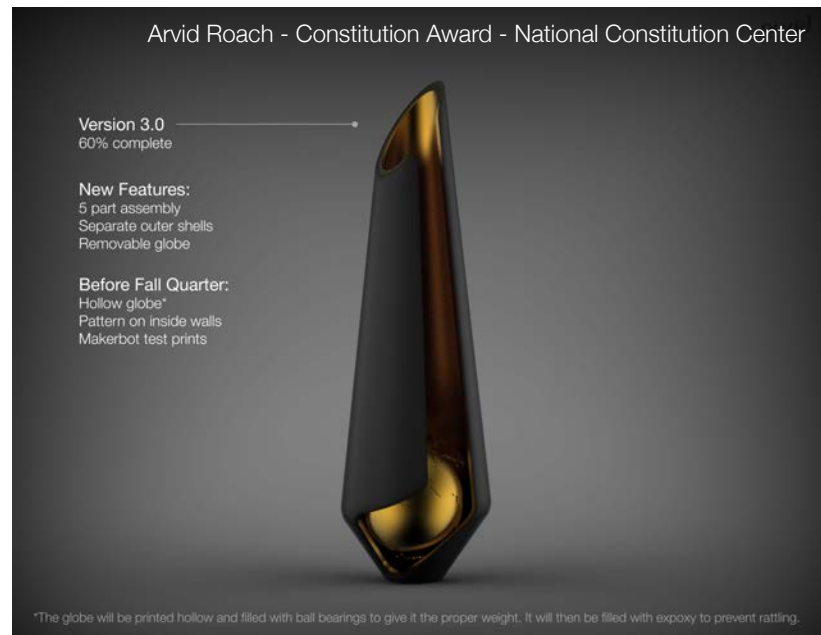
Because SAD gets triggered by a lack of sunlight, the glasses are a way to treat the disorder. Light via specially designed lenses provides more sunlight than it actually does, and is 80% effective in alleviating symptoms.



Troy Hudson - Lumiware project featured in Fast Co. Product Design Program Featured on the Front Page of the Philadelphia Inquirer - Business Section

<http://www.fastcodesign.com/3030381/google-glass-meets-cyberpunk-light-therapy>

http://articles.philly.com/2014-05-30/business/50185727_1_inhaler-drexel-university-seasonal-affective-disorder



Turbine Centered Between Buildings with Street Light Mounted Underneath



Osman Cuto - Breathe project featured in MedCityNews

<http://medcitynews.com/2014/05/asthma-inhaler-app-designed-patients-point-view/>



Student Outcomes / Senior Thesis

Attached are three final projects from Seth Fowler, Megan Peaslee, & Osman Cueto. These are banners for their senior show.

SoundBITE



SoundBITE is a simple solution for musicians who don't have the means or technical knowledge to utilize a professional studio. It is an all-in-one device that gives the user a way to easily create quality recordings. The product also allows musicians to take full ownership of their work and gives them the freedom to experiment and play with music creation.

How SoundBITE Works

Record Sound

We have a built-in microphone that can record audio from your phone and output it to the SoundBITE.

Set Levels

The SoundBITE has a built-in level meter that can be used to set the volume of the SoundBITE.

Play to Studio

SoundBITE has a built-in USB port that can be used to connect to a computer or a digital audio interface.

The Sample

The SoundBITE has a built-in sample library that can be used to create a variety of sounds.

Multi-Track Support

SoundBITE has a built-in multi-track support that can be used to create a variety of sounds.

Digital Interface

SoundBITE has a built-in digital interface that can be used to create a variety of sounds.

Device Features

2-Band Digital Interface
Sample Rate: 44.1kHz
Digital Effects Processor
Multi-Track Support
Sample Editor

Recording and Editing a Sample



Once the device had been made to create a portable device that could accomplish most of the necessary recording processes, it was necessary to create a physical form. Form ideation began with dozens of form models and progressed into more detailed form core models and finally laser cut wood. As the design progressed it began to take the shape of a waveform, which communicated the idea that it was a musical device.

Insights

The waveform shape communicates the general purpose of the device.

A small portable size is necessary in order for the device to be used for musicians.

Front



Back



Project by **Seth Fowler**
SETHGFOWLER@GMAIL.COM

SoundBITE

Design Stages

Market Research

In-depth research of the musical equipment available to consumers was conducted in order to determine whether there were holes in the market and where there was room for innovation.

Insights

Quality equipment is very expensive. A lot of recording equipment is not user friendly.

A majority of devices are made for a single purpose which means recording set up can become messy and cluttered.

User Interviews

Interviews were conducted with users ranging from hobby musicians to professional studio engineers. They were asked about their wants and needs as well as observing their recording process.

Insights

Musicians are always looking for new ways to create. Studio equipment tends to get messy and unorganized. Musicians look for all-in-one solutions for portability.

Recording Experiment

In order to get a feel for different recording methods, I recorded a song in four different ways and took note of the pros and cons of each method.

Insights

Equipment quality makes a lot of difference. Price tends to dictate sound quality.

Form Ideations

Idea sketching and brainstorming took place after the initial research to start exploring possible solutions. Research dictated that the solution should be an all-in-one device that added in the recording process as well as adding innovative new ways to make music.

Design Criteria

The solution must:

1. Be an all-in-one solution
2. Simplify the recording process
3. Be portable
4. Add value to music creation

Sketch Models

Three form directions had been selected, each of which had its own benefits. The floor module was chosen as the final form factor due to its simplicity and usability. Both the other form factors had problems with internal and were not functional in certain use cases.

Insights

An uncomplicated form factor makes the product more accessible to users.

Form Directions

Carabiner

In-Line Flex

Floor Module

Validation Interviews

The final step was to return to the original interviewees and review the product with them. A few suggestions were made to refine the concept, specifically an app to control the device through a smart phone, the size of the form factor and certain usage methods.

Insights

A smart phone app allows for certain innovative features that aren't possible with a stand alone device.

Users understood the waveform design and what it communicated.

Final Design



SoundBITE

The final product is an all-in-one solution that gives users the tools to create high quality recordings with their limited equipment. The app adds innovative functionality and wireless control of the device.

Project by **Seth Fowler**
SETHGFOWLER@GMAIL.COM

Reading with Arthritis

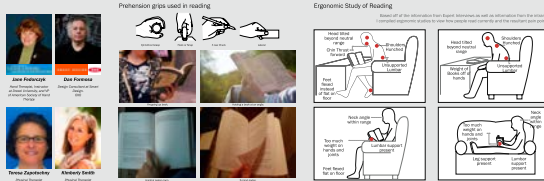
The Acute Reader is a reading system for people with arthritis that reduces the amount of pain and discomfort experienced while reading a physical book.

Reading with Arthritis

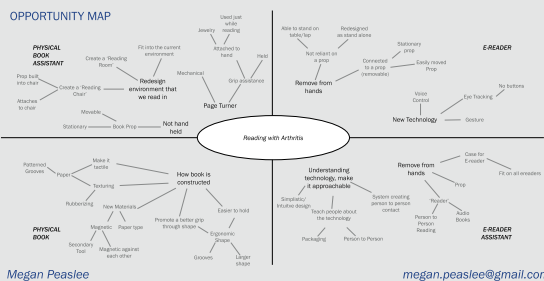
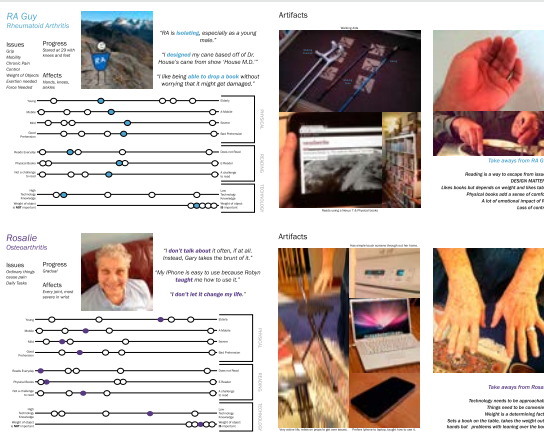
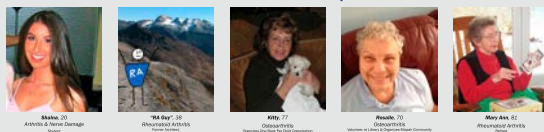
The Acute Reader is a reading system for people with arthritis that reduces the amount of pain and discomfort experienced while reading a physical book.



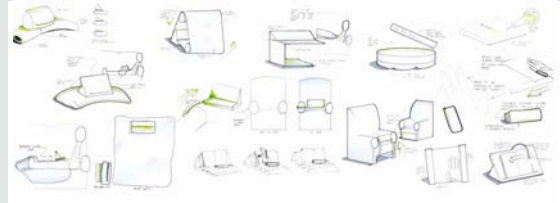
Expert Interviews



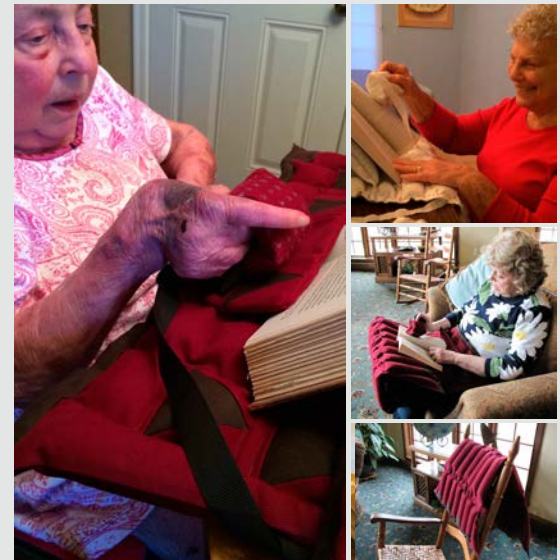
Research Participants



Original Sketches

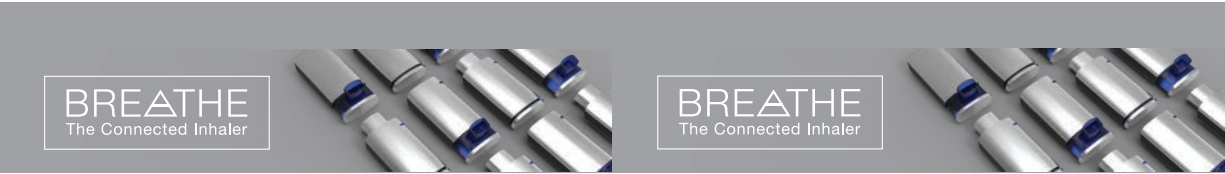


Making Process



Acknowledgements

Many thanks to everyone who made this project possible! My research participants that helped to inform my decision making: Shaina Oltsky, The Rheumatoid Arthritis Guy, Rosalie Cohen, Kitty Salter, and Mary Ann Peaslee. The experts who took the time to speak with me about each of their fields: Jane Fedorczyk, Dan Formosa, Teresa Zapotchny, and Kimberly Smith. My professors that helped me along the design process: Sara Dierck, Verena Praepcke-Hjeltness, Mike Glaser, and Roberta Gruber.



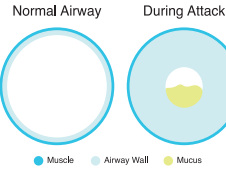
BACKGROUND

An asthma attack occurs when less air is able to flow through the airway. More specifically, it is caused when the muscles around the airway tighten. The tightening results in the swelling of the airway walls, reducing the amount of air that is able to pass through. Mucus also builds up and fills the airways, obstructing the flow of air even more.

Asthma attacks can happen at anytime, particularly when one is exposed to "asthma triggers". Attacks can occur due to the exposure to various substances and activities. All cases of asthma vary from one another, thus, the triggers differ from person to person.

About 3 in 12 people in the United States suffer from asthma

COMMON TRIGGERS



MEDICATION

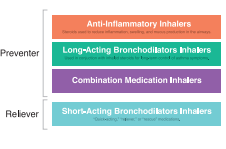
Preventer
Preventers are used to prevent any symptoms from occurring in the first place. They are not used to relieve asthma symptoms once they have occurred, but they are used to prevent them from occurring in the first place.

Reliever
Relievers are used to relieve asthma symptoms once they have occurred. They are not used to prevent symptoms from occurring in the first place, but they are used to relieve symptoms once they have occurred.

Inhalers (MDI)
Inhalers (MDI) are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs.

Dry Powder (DPI)
Dry Powder (DPI) inhalers are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs.

Nebulizers
Nebulizers are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs. They are used to deliver a measured dose of medicine into the lungs.



INHALER DESIGN



USER INTERVIEWS



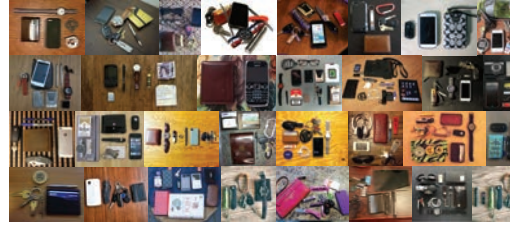
Dr. Kenneth L. Jacobson
Family Doctor
Dr. Kenneth L. Jacobson is a family doctor who deals with asthma. He diagnoses and prescribes asthma medication almost on a daily basis. Dr. Jacobson discussed his about how various asthma is and what exactly happens during an attack. During the interview he went over the different types of medication.

Adam Lynn
Researcher at GSK
Adam Lynn works as a Researcher at GlaxoSmithKline. His day to day job consists of researching and testing possible new formulas for the medicine that go into the Mediator. During the interview he spoke a lot about the current carrier that holds the medicine, how inhalers work, and how the medicine gets to your lungs.

SYNTHESIS



EVERY DAY CARRY



I collected pictures of objects people carry with them each and every day. These people were ages 20 and up. Having asthma means having to carry a rescue inhaler every day. It is important for me to understand the reasons people carry what they carry, and more specifically, the sizes and materials of those objects. It is crucial that my design fits their lifestyle, rather than having the people change their life to fit their asthma.

IDEATION



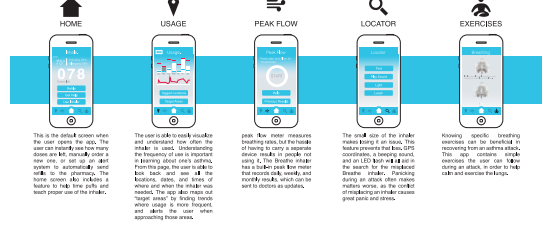
DESIGN



MODELING



MOBILE APP



INHALER

