UNIVERSITY OF DESIGN, TO WHAT DEGREE?

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1.0 INTRODUCTION

The field of industrial design (and it's very name) grew from nineteenth century integration of arts and industries during the second industrial revolution. The 1876 Centennial Exhibition, with its massive hall of industry, attracted, "...nearly 9 million visitors at a time when the population of the United States was 46 million…(introducing)…America as a new industrial world power, soon to eclipse the might and production of every other industrialized nation." (Centennial Exhibition Digital Collection, 2001) In preparation for this groundbreaking World's Fair, The Pennsylvania Museum School of Industrial Art was formed whose curriculum was, "...intended to be 'distinctly industrial.'" (The University of the Arts Libraries, n.d.)

The emphasis on industrial suitability in the arts continued into the early twentieth century. While formation of applied creative-practice focused on servicing this new machine-based manufacturing economy of product multiples; the emerging discipline began to recognize design's greater cultural role. Notable educators asserted designs importance and sphere. Frank Alvah Parsons stated, "Industry is the nation's life, art is the quality of beauty in expression, and industrial art is the cornerstone of our national art." (Parsons The New School, n.d.) Institutions such as Parsons and the Bauhaus pioneered the creation of beautifully designed objects that fulfilled public need and financial profit.

Although designers nurtured ideas outside of mass-produced industry, the early twentieth century American culture primarily valued designers as product stylists - apolitical, unconcerned with labor, or other pressing matters. Attitudes towards industrial production were not universally positive. Educators, such as California College of the Arts founder Frederick Meyer, imported European Arts and Crafts movement philosophies of handcraft and community. (California College of the Arts, n.d.) However, the role of the designer in creating mass-market products was generally institutionalized following the great depression, world wars, and population boom. Unceasing commercial and technological development asserted mass-production as designs primary vehicle of expression.

By the mid 1980s industrial design had evolved to include business leadership, user-centric thinking, functionality, and multi-disciplinary problem solving. By the twenty-first century global shifts in manufacturing locale catalyzed and expanded industrial design's role in shaping the world. Consultancies such as IDEO and FROG develop innovative projects in the public and private sectors with equal expertise and fluency. Today there can be no assumption that a graduate of an industrial design education will necessarily design mass-produced consumer-products. They may design services with a social enterprise or perhaps become an entrepreneur that helps define how the "…digitization of

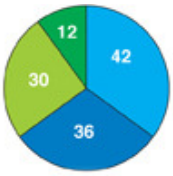
manufacturing will transform the way goods are made—and change the politics of jobs too". (The Economist, 2012)

Today's industrial designer has responsibility to holistically consider the contexts that inform their work. While industrial design's moniker has not changed, it has evolved to become a vital contributor to contemporary life. Today it's core services, ability to empathize, learn, responsively adapt, and to work on a team (laterally across fields) has allowed industrial designers to create integrative solutions for diverse stockholders. It's process of continuous evolutionary iteration positions industrial design to support and prototype ideas around environmental stewardship and social-justice - realms previously unknown to the field.

2.0 NEW DEMANDS, NEW EDUCATION

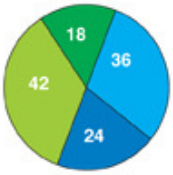
Through its curriculum committees and university-wide leadership Parsons the New School for Design (Parsons) has led a charge to "increase the ability of a student to work across Parsons and to seek out different (institutional) paths." (Parsons Faculty Presentation, 2011). The following pie charts show a few possible scenarios of how future undergraduates might tailor a unique educational experience (Table 1.).

Disciplinary Focus
BFA Student with single disciplinary focus, using all available credits toward the major



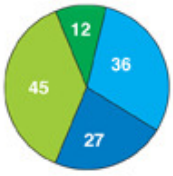
Distribution Area	Credits		Percentage of total	
Major/studio studies	42 cr	90 cr	35%	75%
Art/design history and theory studies	12 cr		10%	
Supportive art/design studies	36 cr		30%	
General studies (liberal arts)	30 cr		25%	
Total	**120 credits**		**100%**	

General Studies Focus
BFA student with single disciplinary focus, and exploring as much general studies/liberal arts as possible



Distribution Area	Credits		Percentage of total	
Major/studio studies	36 cr	78 cr	30%	65%
Art/design history and theory studies	18 cr		15%	
Supportive art/design studies	24 cr		20%	
General studies (liberal arts)	42 cr		35%	
Total	**120 credits**		**100%**	

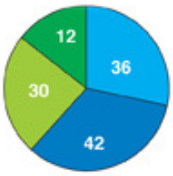
Liberal Arts Minor
BFA Student with single disciplinary focus + non-Parsons Liberal Arts minor



Distribution Area	Credits		Percentage of total	
Major/studio studies	36 cr	75 cr	30%	62.5%*
Art/design history and theory studies	12 cr		10%	
Supportive art/design studies	27 cr		22.5%	
General studies (liberal arts)	45 cr		37.5%**	
Total	120 credits		100%	

*Under guidelines by 2.5% **Over guidelines by 2.5%

Parsons Minor
BFA student with single disciplinary focus + Parsons disciplinary or thematic minor.



Distribution Area	Credits		Percentage of total	
Major/studio studies	36 cr	90 cr	30%	75%
Art/design history and theory studies	12 cr		15%	
Supportive art/design studies	42 cr		35%*	
General studies (liberal arts)	30 cr		25%	
Total	120 credits		100	

Over guidelines by 5%

Table 1. Courtesy, John Roach. Parsons The New School for Design, The Committee on Undergraduate Education. 2011

The revision of the curriculum offers students the flexibility to prepare for different career paths, preparing undergraduates who may go directly into practice, but may also go onto pursue further graduate studies. Considering the growing variety of types of professional practice, the assumption that a bachelor's degree is the normative standard for entry into the field is problematic. The undergraduate degree must prepare

students with transferable skills and thinking methods. In American history, English or political science there is no expectation of an undergraduate commanding the field without further study. In response to a complex world, pursuing deeper inquiry and scholarship has never been more relevant.

Students must be able to explore discipline boundaries and interconnections early on in their education. First degrees often act as a counterpoint to the second: law after engineering, urban studies after economics, business after industrial design, and so forth. Tim Marshal posits that the "…legacy in both Europe and the US that the Bachelors degree delivers all that is needed for a professional design career…complicates the model." He goes on to state, "...successful designers have not had an education that focused narrowly or exclusively on design, and great designers have emerged from a range of places. There is no universal recipe." (Form magazine, 2009) The variety of roles that future-thinking designers might take-on is infinite; only through exposure to real life situations (project work) and a diverse palette of skills will they begin to operate as world citizens. This demands openness to a variety of courses and educational pathways and requires a rigorous structure surrounding major disciplinary learning. Clearly communicated, appropriate expectations are critical to ensuring students obtain the skills they need to pursue a diverse careers.

A. *The stage of student learning that relate to the learning outcomes of the program*	UNDERSTANDING	The student has the ability to apply knowledge of the topic within the design process consistently, but often in a basic and routine way.
	COMPETENCE	The student has the ability to apply the knowledge in multiple ways that show an understanding of more subtle aspects of the topic.
	STENGTH	The student is conversant in the language and importance of the topic in relation to product design.
	DEMONSTRATION	The student has the ability to consistently and accurately apply the knowledge in their own way, making subtle distinctions in where and when the knowledge is applicable.
	FLUENCY	The student can apply the knowledge in unique and improvisational ways to support design arguments.
B. *The stage of course teaching related to the learning outcomes of the program*	NOT INTRODUCED	Not covered in the course.
	INTRODUCTION	Concepts are introduced but not expected to be executed by the student in project work / without assessment.
	DEPTH	The majority of skills taught to at least a basic level with regular assessment in related classes.
	DEVELOPMENT	Additional skills taught to bring the student learning to the next level (i.e from understanding to competence, competence to strength).
	SUPPORTING	Skills are developed in coordination with an in depth course and are expected to be demonstrated through project work but not assessable in the supporting class.
	REINFORCING	Skills are expected to be demonstrated through project work and are assessable in the course.
C. *Level of engagement of competencies and learning outcomes within progressive values*	NO	The learning outcome is unrelated to the value.
	POSSIBLE	Through the teaching of the learning outcome the instructor may introduce or engage with elements of the value at their discretion.
	LIKELY	Through the teaching of the learning outcome the instructor will be encouraged to engage with elements of the value.
	YES	Instructors and students will engage with elements of the value with this learning outcome.

Table 2. Courtesy, Rama Chorpash, Patty Bierne, P.J. Carlino, Parsons The New School for Design, 2011

By shifting expectations of mastery to the graduate degree the undergraduate industrial design curriculum is relieved of the need to teach all aspects of the profession. Fewer courses need be dedicated solely to teaching discrete skills such as computer software or material specific methods. Students can develop a depth of knowledge in particular aspects of design through project-based work that demands learning on an as needed basis with strong critical thinking and communication across disciplines. This proposal

pinpoints design-process, a core set of design skills, and self-awareness of the learning process as the primary position and role of contemporary program pedagogy. A well-rounded and adaptable undergraduate curriculum can no longer support the by-gone concentration on industry alone. A rigorous structure is needed to preserve and nurture program culture within the large course offerings of a full university.

3.0 CASE STUDY: PARSONS PRODUCT DESIGN PROGRAM

Participating in a trend at many design schools, Parsons entered into a school-wide initiative to reduce the bachelor of fine arts to one hundred twenty credits and create space for minors that would provide flexibility for self-directed study and prepare students for multiple career paths. The challenge of re-envisioning the product design curriculum entailed rethinking the existing curriculum that, though rich in course offerings, was not serving this larger objective. The task of reducing credit hours forced critical reflection on how the curriculum will deliver the best experience to students, and how that experience fits into the history and trajectory of the field.

3.1 THE STRATEGY

Several questions guided the curriculum overhaul. How to create a curriculum that honors the strengths of the program while meeting the needs of emerging practice? How to reduce the degree credits, increase the value of the credits earned, and achieve a robust education with appropriate breadth and depth of learning? What are the threads of learning in the existing curriculum (such as: sustainability, materials, prototyping, presentation) that can be integrated into the learning outcomes of larger courses? What are the skill sets that are necessary and unique to a product design education at Parsons?

By eliminating discreet skills-based courses and integrating the content of those courses into a project-based studio model, studio inquiry now appropriately bears the weight of skill development. Rather than attempting to predict a finite number of skills that students will need to meet the expectations of the broad and ever-changing field, the expectation is that skill acquisition serves contextual investigation. Product design does not require a fixed checklist of skills, but rather skill building through a process of thinking and making.

3.2 SHAPING EXPERIENCE THROUGH CURRICULUM

Students enter the product design program following foundation year, leaving the second through fourth years for students to acquire appropriate command of the history, theory and practice of product design. Profiles of each year's experience aid in the understanding of how a larger vision can inform the learning outcomes and assessment methods of individual courses. At the top of Table 2.A each year's cluster of courses has overall description which flavors approach for student and faculty alike.

The "2nd Year Experience" introduces the acquisition of methods, materials and process. The cultivation of teamwork, personal voice and program culture play a central role in the studio. Core competencies include the execution of individual and team projects, the application of feedback, and the synthesis of critical and model-making skills. The "3rd Year Experience" applies the skill sets of the second year while exposing students to the realities of the profession, production and project work. Students in the third year

hone their articulation of the design process from design intent through execution by participating in critiques and other forms of public evaluation. Emphasis is placed on the difference between innovation and incremental change by asking students to identify these principles within their work. The “4th Year Experience” provides a challenging atmosphere with increasing latitude for framing design opportunities, project briefs and strategic approaches. In the context of a final capstone project, students devise and execute a design intent to the “proof of concept” stage. High expectations for project closure and advanced presentation give students the opportunity to accomplish a higher level of design development, presentation and understanding.

3.3 ESTABLISHING A TRAJECTORY OF EXPECTATIONS AND OUTCOMES

The core studio courses are designed as a six-part series, establishing a trajectory of expectations and outcomes that build upon each other. Each year of the program in this new curriculum depends on the last to bolster confidence and allow students to apply their deepening skill sets to a broadening set of contexts. The core studio becomes the place where students develop skills needed to apply their analysis. This model is designed to give instructors more latitude to fully apply their expertise as well as more responsibility to foster a synthesis of formal and critical skills.

The final semester of the program calls for demonstration and synthesis of acquired design skills and processes through a self-guided capstone project. Reconciling multiple stakeholders and audiences, students work towards presenting their projects as a form of social engagement, with a particular focus on user-centered design. Studio faculty act as facilitators with development and brief defined through student research. The self-guided process employed in this semester includes the design, testing and formal execution of a final prototype that reflects user group engagement from ideation through execution. The focus of the faculty is to help the student best identify their depth of skill and work to apply the depth to an appropriate and challenging context that engages stakeholders outside the university. This process further deepens the interests and skills of the student, giving them ownership over their design process and outcome while demonstrating synthesis of prior program learning.

4.0 MATRICES AS A TOOL FOR CURRICULUM RE-DESIGN

A significant reconsideration of the curriculum was required to achieve the drastic reduction in credits and open flexibility in the curriculum for self-directed study. A collaborative tool was needed to collect and collate the existing curriculum, and to adjust and communicate the revisions. Ideally the tool would provide a means for continuous evaluation and improvement for all stakeholders: students, faculty, and administrators. (Armoayor, 2010)

The curriculum mapping process outlined by Harden for health care education (Harden, 2001) was modified and applied to the product design curriculum. The team designed visually engaging, clear, curriculum matrices that could be easily shared and modified. The creation of the matrices was a method of building the curriculum from a foundation of learning outcomes, while making evident the connections between learning outcomes and program competencies and the progression of learning that builds toward the capstone project. The end product visually charts the entire curriculum and can be used in

communicating to stakeholders: what is taught, how it is taught, when it is taught, the expected level of achievement and, how achievement is measured.

The program needed to comprehensively assess the existing curriculum to identify differences between the declared curriculum, the taught curriculum and the learned curriculum (Harden, 2001) Written documentation was collated: course descriptions, syllabi, and reports from previous curriculum reviews. To determine what was actually taught meetings were held with course coordinators and faculty to review assignments and lesson plans. Critiques were attended and student work reviewed to determine actual learning.

Table 2. Courtesy, Rama Chorpash, Patty Bierne, P.J. Carlino, Parsons The New School for Design, 2011

Using active data spreadsheets, two curriculum matrices were created: a course matrix with columns listed for each core course (Table 2.A), and a depth matrix to demonstrate the progression of knowledge through the program (Table 2.B). The matrices of the existing curriculum made visually evident redundancies in the learning outcomes and facilitated the consolidation of courses and the reduction of each course to its essential core.

To pace the student learning a consistent set of terms was defined for degrees of proficiency for each learning outcome. Clearly communicating the expected proficiency avoids redundant teaching and distributes the learning across multiple courses. Student workloads are reduced, freeing time and increasing flexibility to participate in cross-disciplinary and extra-curricular learning opportunities.

Terms were defined for the depth of engagement with program competencies and values to clarify the relationship between skills and values taught in multiple courses. The definitions ensure that outcomes learned in prior and concurrent courses are introduced, reinforced, and developed at the appropriate stage of the student experience. Faculty are clear where and when skills are taught, and as importantly, when and where skills should not be taught. Students and advisers can make strategic decisions to take elective courses without fear of missing key learning outcomes.

Terms were defined and applied to program competencies to indicate the likelihood of engaging with these overarching values. The matrices are a dynamic tool for introducing values from the evolving mission of the institution and changing design philosophy such as sustainability, civic engagement or social justice.

The Course Matrix (Table 2.A) lists the required parameters for each core course. The courses are arranged in columns and grouped by semester to give an overview of the student experience. The rows beneath each course list the learning outcomes, the time commitment, whether the course is required for the minor, the deliverables and learning activities, and the assessment methods and criteria. Learning outcomes are defined using the proficiency terms, and coded and linked to assessment methods and learning activities. Conditional formatting was used to dynamically and visually highlight the expected proficiency of each learning outcome giving all stakeholders an understanding of what outcomes are emphasized, and to what degree.

The Depth Matrix (Table 2.B) gives a staged, multi-dimensional view of the curriculum that links the program competencies to learning outcomes, individual courses, the overarching values, and the depth of student achievement over time. Learning outcomes are grouped into program competencies and conditional formatting was used to highlight the depth of engagement in three areas. 1. As students move from semester to semester the degree of proficiency in each learning outcome (*understanding* to *fluency*) is indicated by increasing depth of color. 2. The depth of engagement with the learning outcomes is color-coded by course to indicate where and to what degree the learning outcome is taught. 3. The likelihood of teaching institution-wide values is indicated and colored for each learning outcome.

4.1 HOW THE MATRICES ARE USED

The course matrix is used to create skeletal syllabi that can easily accommodate different topics based on faculty expertise. For example the studio on Human Factors, Ergonomics & Interface can be taught using topics such as furniture, lighting, digital interface et cetera. Different points of entry to the same course content offer students the opportunity to develop areas of expertise and interest as they move through the program, while ensuring all program competencies are achieved.

The depth matrix is used to communicate to stakeholders how and when program values are taught and to what degree competencies are covered in the curriculum. For example the learning outcome Using drawing to present a concept to a design manufacturer is defined as Yes, a place where Sustainability must be engaged. Since that learning outcome is taught in-depth in the course Process Drawing and Digital Presentation, the faculty member knows it is critical to teach about how the drawing stage can be used to illustrate issues of sustainability (reducing excessive material, ensuring appropriate durability, and so on). The student is expected to achieve *strength* in that learning outcome by the spring of the sophomore year, and *fluency* by the spring of the junior year.

5.0 THE FUTURE

The matrices are visual and spatial representations that will be used to communicate the relationship among courses, learning outcomes, program competencies and institutional values to students, faculty and administrators. They are a platform for conversation about the curriculum and serve as a dynamic and strategic tool to facilitate the introduction of values and competencies. This platform creates a transparent curriculum that allows not only the students, but also the faculty and administration to understand the expectations and outputs at each stage of learning within the program.

Strategically adjusting the curriculum to support students that will go on to graduate degrees is critical to industrial design reaching its full creative and academic potential. A rational, nuanced, undergraduate curriculum can be extended to the graduate level by adding competencies and by defining additional proficiency terminology such as *mastery*, *knowledge transfer* and *expanding the field of knowledge*. While achieving such fluency might be aspirational for undergraduates, those who exhibit promise before graduating would make strong candidates for direct-entry into more advanced study.

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