

## **BEYOND PHD., EXPECTATION FROM AMERICAN INDUSTRIAL DESIGN INDUSTRY**

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### **Background of Study**

American industry designers are facing unprecedented domestic and international competition. There are more than a thousand industrial design firms in the U.S. listed in <http://www.coroflot.com>, a major American designer portal website. After investigating 286 of these firms, we found 20% of them were established in the last five years and 50% in the last ten years. In spite of the rapidly growing number of design firms, many US manufacturers are outsourcing their product design to foreign countries (Engardio & Einhorn, 2005) to lower their R&D cost and to be closer to their production sites which have already moved overseas. In the meantime, more American design schools are sending more graduates to the industry every year, further escalating the competition. In addition, the design schools in many other countries, especially in Asia, are generating great numbers of designers who are potential competitors to their American counterparts as a result of the outsourcing trend of R&D. Korea and Taiwan have each doubled their industrial design programs in the last decade to almost equal that of the U.S. There are more than 11,000 industrial design students graduating each year from 230 schools in China, 68 of them founded after 2001 (National Instructive Committee of Industrial Design Education China, 2005). The National Development and Reform Commission of China is planning to build Chinese industrial design into a major international competitor by 2020 and a new global design power house by 2030.

The intensifying competition is challenging American design industry to perform more effectively and efficiently at shorter lead time with less cost. These challenges are also requiring industrial design education in the US to prepare students with better competitiveness in the market place. To improve the quality of design education, many US educators are exploring various avenues of design schools. Doctoral study in design is one of the directions that many educators are working on in order to enhance American design education. This paper aims to provide a perspective according to the industry, and raise questions as to how they perceive the priorities of design education and how they response to the transition to making PhD as the terminal degree for industrial design. This paper, however, does not attempt to judge the merits of one viewpoint over another; nor does it attempt to state that the goals of industry in terms of education are more important than students' goals, or research/universities' goals. Rather, it is intended to provide a comprehensive analysis of how many design firms and companies respond to the idea of the transition, and to help create a more balanced perspective of how the changeover will affect an important beneficiary of design education: the industry that employs design graduates when they complete their studies.

### **Method of Study**

#### Survey Questions

The survey was distributed through one-on-one e-mail to respondents. A variety of question formats including matching, ranking, and choice were used to gain a more complete perspective. This 18-question survey appealed to a varied population of design professionals on several issues pertaining to design education including the priority of various design skills, areas needing improvement in design education, company hiring practices, and the transition of the terminal degree for industrial design educators from Master's to PhD. Significant data about each

respondent's organization's size, revenue growth rate, outsourcing policy, organization, and hierarchy was also collected. A range of organizations was polled, from small design consulting firms to large-scale manufacturing corporations.

### Participant Selection

An in-depth survey was distributed to a broad spectrum of 1,343 designers, managers, and executives working for both design consulting firms and manufacturers. Individuals selected to receive the survey were listed in the membership directory of the Industrial Designers Society of America (IDSA). IDSA is the major organization of industrial designers in the United States with more than 3,000 members. The first round of surveys was sent to all design consulting firm department heads listed in the IDSA directory. The second round of recipients consisted of all listed designers and managers working for manufacturers. This selection of recipients was intended to promote a diverse and well-balanced response with views represented from designers to managers to executives.

### Limits of Study

After receiving survey results, there were factors of concern. The first factor was the 9.3% rate of return, which may indicate that only those who felt strongly about the issue completed the survey. If this is the case, the results may demonstrate a more polarized/specific response of those who are most affected rather than the broad-based sentiment of the entire group. However, the overall results of this study were very consistent despite the concern of a lower response rate than expected. The second concern is inherent in polling surveys; respondents are limited to the answers provided by the survey author. This problem was addressed in part by the addition of an "other" option in many cases, in which a field was provided for a respondent to add his or her own response. Another limitation of this type of research is that some respondents felt the questions were too vague or too general. Further, it was difficult to rank the value of certain skills, which all seemed important. These concerns are all recognized limitations of opinion polling. Despite this, the survey method provides the most correct first hand information in accordance with an accepted standard, as well as, providing quick and easy-to-analyze data.

### **Results of Survey**

Most of the respondents work for manufacturing corporations (59%) or for consulting firms (26%). The sizes of the organizations surveyed include a wide range; some 21% have between one and ten employees and 56% employ more than 200 people. Seventy-three percent of the manufacturers that were surveyed have more than 200 employees and 44% of the design firms employ less than 10 people.

Eighty-two percent of the respondents hold bachelor's degrees and 17% have master's degrees. Ninety-two percent hold degrees specifically in the field of design. Respondents come from a variety of industry backgrounds and environments, as well. Both large and small companies are represented; from design firms and manufacturing factories, from consumer products to industrial equipment, from well established organizations to start-up firms. Most companies do, however, have a strong emphasis on and respect for industrial design.

The survey results indicate that industrial design has, on the whole, plays a more (41%) or much more (29%) important role for manufacturers than it did five years ago. No more than 26% think the importance has remained the same and only 4% answered that industrial design is becoming less important in their organizations. This increasing significance indicates that corporate

America is focusing on industrial design as a strategy to help answer escalating international competition and satisfy more demanding consumers. In a similar study conducted by British Design Council (2005), 50% of the manufacturers in the UK think design is increasingly important to their competitive edge.

Over the past five years, the revenue of 80% of the organizations has increased, with 43% growing more than ten percent. It is relevant to note that of the manufacturers whose industrial design function has become much more important in the past five years, 63% of them reported a more than 10% average annual growth in their sales revenue. More than 10% of average growth is a very significant increase for manufacturers as total sales of US manufacturers grew only 2% in average for the last five years, according to US Census Bureau. This reinforces the findings of Hertenstein, Platt, and Veryzer (2005) that industrial design is able to enhance a company's financial performance. With such high rates of growth for companies placing a great value on industrial design, the quality of design graduates is becoming increasingly important to corporate America.

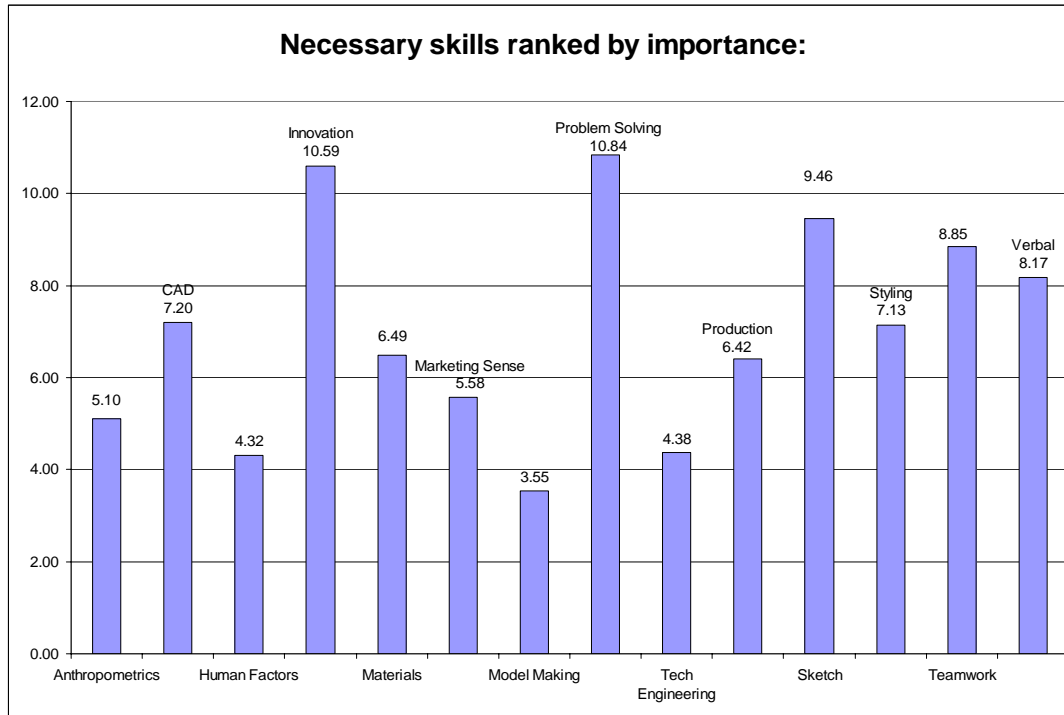
#### What Does Industry Most Want From Design Graduates?

One of the first questions in the survey solicits respondents to rank the most important criteria for hiring new designers. The design industry expects graduates to have certain skills upon degree conferral, and it is important that educators understand the industry's needs so that students can be duly prepared. According to the responses of this survey, a design graduate's portfolio is the most important factor in the hiring process. A nearly equal amount of emphasis was placed upon creativity. The third most important factor was a graduate's experience. Resumes, GPAs (grade point averages), and the use of entrance tests were rated with less magnitude.

Portfolio, the most important factor according to this survey, presents a potential job candidate's design skills integrated with creative ability and problem solving capability. This finding resonates with the results of another question, which asked respondents to rank a list of skills deemed to be most important for design graduates to possess (Figure 1). Results from this question show that problem solving and innovation, closely followed by sketching are the top three sought-after skills, echoing the most important criteria for hiring designers—portfolio and creativity—as outlined previously. Each skill has a score nearly equal to that of the other. Of secondary importance were teamwork, verbal, and materials skills, followed by computer-aided drafting (CAD), styling, production, anthropometry, marketing, human factors, and technical engineering skills. The category model making was ranked least important. However, the difference between the least important and most important categories is only a few points, indicating that after problem solving, innovation, and sketching, all other skills are similarly important, with the exception of model making. A balanced design education centered on these three major skills seems to be the expectation from the industry.

The other interesting perspective is the importance of "Team Work" which is the most needed skill immediately behind problem solving, innovation, and sketch. Industrial designers are more likely to be working within a team these days rather than as independent individuals like in the past because of the complexity of requirements and the need for efficiency. Designers are expected to work not only with other designers but also with engineers, marketing, and production counterparts in the same firm, in different companies, or even in different countries through the Internet. Thus a designer's ability to work within an interdisciplinary team is becoming more and more critical to the industry and it should be a new focus that design education ought to pay more attention to.

Figure 1



### What Areas Need Improvement?

Following the question of most important skills for design graduates, it is relevant to explore the areas in which design graduates need the most improvement. According to this survey, practicing design professionals see innovation, problem solving, and sketching (three of the most important skills for graduates to possess) as needing improvement. Respondents were moderately satisfied with students' sketch abilities. Another interesting note—model-making was given the highest level of satisfaction when professionals were asked to rank the abilities of recent graduates, yet it is the least important category when professionals were asked to rank the most important skills for an industrial designer. This is likely due to the decreasing need of model making skills for industrial designers in this era of rapid prototyping and the increasing value of time (Reeder, 2004).

In the ranking of skills which need improvement, sketching skills were rated fifth, innovation was seventh, and problem solving was ninth, out of 14 different abilities taught in industrial design programs. It should be noted that these three skills need improvement because they are the most important skills an industrial designer can possess. Other areas of improvement, such as verbal skills, teamwork, technical engineering, marketing and knowledge of materials need to be addressed because they were rated substandard for graduates.

Areas of materials knowledge, technical engineering, and marketing are shown as needing more improvement. The field of marketing is abundant with research opportunities and students will only benefit from learning basic marketing concepts and understanding how products should be designed to compete in the marketplace. Fundamental marketing research strategies are necessary for designers to understand their target market and by placing industrial design students in a more business-like context, such as industry collaboration projects where they must practice real-world

design requirements, they will have a better idea of what to expect and what is expected of them as they move into the work environment.

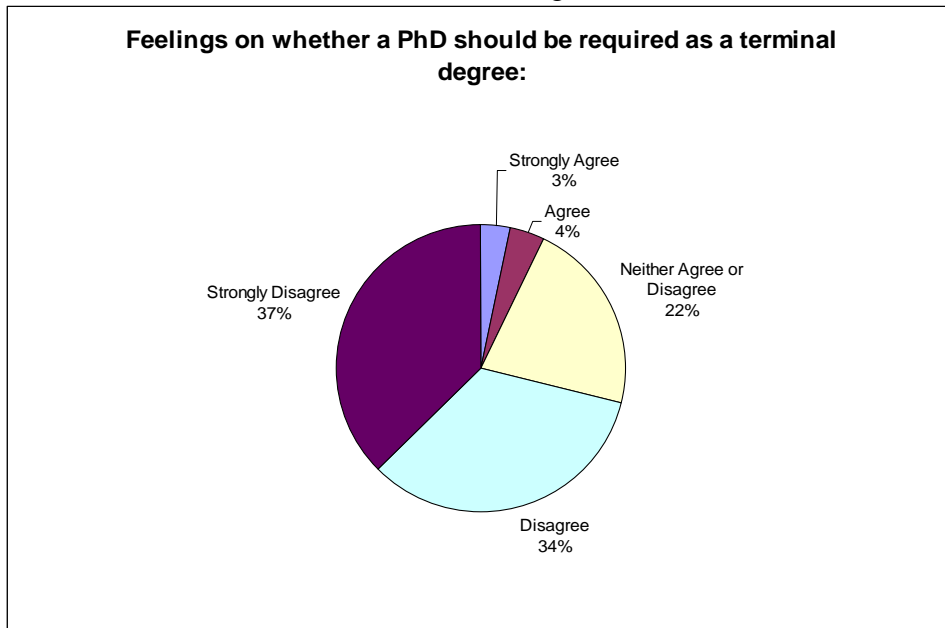
### Focus of Faculty

The survey also addresses the industry's preferred focus of industrial design university faculty. This survey shows that research directed toward publication and design competitions were the lowest-ranking categories, indicating that the design industry does not see them as being readily applicable to the teaching of problem solving, innovation, and design skills, which make up the primary need from the point of view of industry. Though it is important to recognize, understand, and advocate the need for pure research, it should not suffocate the longstanding practical tradition of teaching industrial design skills.

### How Does Industry View the Transition toward PhD Design Faculty?

There is an on-going trend in the US toward making a PhD a required degree for design faculty. A majority (71%) of survey respondents disagreed (34%) or strongly disagreed (37%) with the statement "PhD will improve design education" (Figure 2). Only four percent agreed with the statement, while three percent of respondents strongly agreed. Twenty two percent marked, "neither agreed nor disagreed". When separated by industry, 74% of consulting firms disagree or strongly disagree and 70% of the manufacturers disagree or strongly disagree with the statement. This response sends a strong signal to educational institutions; most designers and design managers do not see the benefits of incorporating a PhD as the terminal degree for design educators. This finding is also consistent with a previous part of the survey in which respondents rank areas they consider most important for design students to be trained. While professors with master's degrees teach design skills, problem solving and innovation, the necessity of a doctoral degree, which is usually centered on research and publication, ranked least important. Overall, the message from the industry is that industrial design education should be focused on teaching design skills along with creativity and problem-solving methods rather than research and publication.

Figure 2



This data was further analyzed to explore the range of responses of those with advanced degrees. An interesting correlation was discovered—respondents holding advanced degrees were more likely to disagree with the statement. Of those surveyed who have graduate degrees (18%), forty percent strongly disagreed with the statement that transitioning to a PhD as a terminal degree will improve the quality of design education. Another 36% of those with advanced degrees disagreed with the statement. The percentage of those holding masters or doctoral degrees that disagree or strongly disagree is 76% compared to the 71% that either strongly disagreed or disagreed from all those who replied. Perhaps because these respondents are more familiar with the process of procuring an advanced degree, they were more likely to have a strong opinion. Having firsthand experiences with graduate school may have convinced the respondents who disagreed with the above statement that students would not benefit a great deal from faculty members having more advanced degrees. Fewer respondents (14%) selected “neither agree nor disagree.”

### **Conclusions of Study**

Though the sample size is limited by the number of practicing industrial designers listed in the IDSA directory, results are consistent throughout the survey. The message from the US industry clearly indicates that design professionals prefer students to focus on their design skills and sharpen their creative/innovative abilities as they attend school, and that they do not agree that greater requirements for the education of design faculty will enable those faculties to meet industry needs more efficiently than the present requirements. Moreover, results indicate that the American industry may view doctoral design work as being overly focused on research and not focused enough on experience, and therefore may interfere with industry goals of graduates with improved skills and increased readiness to work. If the path to PhD is to be continued, academia must show the industry that students will leave school better prepared to be designers.

This paper does not intend to advocate for or against the transition from Master’s to PhD, but to bring to light an underrepresented point of view—that of the American industry. No matter what qualifications, diplomas, or degrees are required in members of an industrial design faculty, the real needs from the perspective of the US industry remains the ability to teach design skills, to inspire creativity, and to educate students to intelligently solve the problems that they will face everyday in their designer career and when they face the competition challenges from designers around the world.

### *References:*

- Design Council (2005) “Design in Britain” Design Council 2004-2005.
- National Instructive Committee of Industrial Design Education China (2005) “Industrial Design School List”. Published by National Instructive Committee of Industrial Design Education, China. [online]. Available from: <http://edu.dolcn.com/schoollist.html> [Accessed June, 2005].
- Engardio, Pete and Einhorn, Bruce (2005) “Outsourcing Innovation”. *BusinessWeek*. March 21, 2005. 84-94.
- Hertenstein, Julie H.; Marjorie B. Platt, and Robert W. Veryzer (2005) The impact of industrial design effectiveness on corporate financial performance. *The Journal of Product Innovation Management*. 22, 3-21.
- Reeder, Kevin (2004) “Design practice versus education: where galaxies collide.” *Innovation*. 23(4), 31-34.