THE FUTURE OF ACADEMIC-INDUSTRY COLLABORATION

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ABSTRACT:

This paper examines traditional industry-academic partnerships which have been relatively successful including corporate internships, work-study programs, curriculum advisory boards, guest lectureships and capstone courses, identifying gaps and opportunities for growth. After assessing the status-quo and how well it's enhancing design education, this paper considers several emerging trends and their implications on academic-industry partnerships. Lastly, this paper proposes several new collaborative approaches to educators and practitioners alike as potential solutions for moving beyond the status-quo and preparing for the emerging trends.

KEYWORDS: Design, Education, Academia-Industry Collaboration, Trends, Future

1. INTRODUCTION

For decades, a variety of communities-of-practice have contemplated, even challenged, the relationship between academia and industry. Academic purists believe that "higher education has as one of its primary missions the acquisition and dissemination of knowledge as an end in itself [focusing] on acquiring knowledge, not necessarily on learning to use it." Further, they argue that higher-learning institutions should be able to advance the thought-space without the pressures of commerce and capitalism (Etzkowitz, Webster and Healey, 1998). Conversely, their opponents who believe that it takes a village to train a designer (Bosley, 1995) and who see the value of academic enterprise, warn that the Ivory Tower is no longer an optimal or sustainable model for education (Etzkowitz et al.). In their view, "the value of knowledge and research is related directly to the market value of the products it produces" (Bosley).

Sutliff (2000), in an article about Technical Communication pedagogy, found a nice middle-ground when she acknowledged, "[. . .] the best teaching and learning incorporates both theory and practice through projects that yoke the two. Realizing that part of their job is to ready students for the workforce, the best professors will tie theory to practical skills and strategies that can be applied on the job." Within the broader design community, "the value of industrial collaboration in an applied subject such as [this] has long been noted . . ." (Evans and Spruce, 2005). Traditional industry-academic initiatives can easily be found, including corporate internships, work-study programs, curriculum advisory boards, guest lectureships and capstone courses. Also, many design professors split their time between their classroom duties and their professional practices.

Opportunities for improvement, however, still remain. The industry is changing and new design methodologies as well as organizational models are emerging. As design shifts from a focus on physical products or digital interfaces to more-holistic multimodal experiences, there is a continued need for "renaissance designers" who embody a combination of design methodology, creativity, human behavior and business sense, as well as an educational construct to support the development of these core competencies. Too often, recent graduates find that they are under-prepared for the "real world" when they graduate, while the design organizations who hire them complain that the new employees lack these critical professional skills.

This paper will examine the efficacy of the current industry-academia collaboration models, explore some of the trends emerging in the design field, and identify new approaches to coordinated education.

2. ACADEMIC-INDUSTRY STATUS QUO

Over the years, academic institutions and corporations have forged a variety of partnerships, the most popular of which (modified from Bosley, 1995) include:

classroom and curricula activities such as corporate-sponsored design studios, corporate supported capstone projects, as well as courses, lectures and panel discussions taught by visiting professionals;

short-term intensive design workshops such as week-long design clinics or multi-week summer workshops that are taught by design professionals in either campus or professional design studio settings with a focus on real-world design issues;

design competitions with a focus on a key challenges in design practice, where project topics and awards are sponsored by a professional design organization;

student and faculty on-site opportunities including tours of design studios and manufacturing facilities;

employment opportunities including summer internships, more intensive co-op positions and other work-study opportunities for students, faculty and alumni;

corporate-sponsored research projects where professors and students, who have more time and freedom to research, can explore topics that are applicable to the sponsor's core competency;

professional conferences and community organizations designed to create knowledge exchange and networking between practitioners, educators and/or students;

presenting and publishing new methods and research at conferences or in textbooks, journals and other relevant publications;

corporate grants and philanthropic donations, which enable universities to direct funds where they see fit and which provide companies with strong public relations stories;

advisory boards that enable academic institutions to receive direction on program and curricula development from industry leaders and/or practicing alumni; and also in the

reverse, advisory boards where academic leaders offer visionary input on future research and development opportunities;

liaison offices, which ensure that connections between corporations and educators are created, maintained and grown.

To understand how well the industry has contributed to or benefited from such collaboration, its participation in the eleven aforementioned engagement opportunities must be considered. Because design practices have adopted a variety of structures and an equally varied set of labels, for the sake of simplicity, this discussion, will focus on three of the more straight-forward and popular organizational structures:

Corporate design teams are usually embedded within large corporations, serving as strategic partners alongside business/marketing, engineering, manufacturing, etc. Companies like Motorola, Apple, Google, Nike, and Sony have embedded teams that have developed design expertise and technology/manufacturing innovations within their specific niche markets. When considering academic-industry partnerships, these teams can often share the lessons about their highly-visible products as well as leverage the resources available to such large corporations to invest in interesting educational initiatives.

Design studios or firms provide design competencies to those companies that do not have their own embedded groups. While they usually don't manufacture their own products, these studios work closely with their clients to develop designs that are business-relevant and produce deliverables that are then manufactured by the client. These companies tend to have a broad portfolio of work and experiences to share with students and the industry-at-large.

Design visionaries are typically formed by an expert (or group of experts) with a particular perspective on design practice. These teams are typically hired by organizations that need visionary design inspiration, design strategy, organizational recommendations, facilitation of design processes, program management, or methods training. Their designs may or may not be productized, but in either case, serve as a very valuable catalysts for change within the client's organization. Instead of visiting classrooms to teach courses in design, these organizations often create their own training programs or organize niche conferences to educate others about their design perspective.

Figure 1 depicts the industry's overall level of engagement with academia relative to the eleven popular models. In addition, it identifies opportunities for improvement (i.e. anywhere you see an open or half-filled circle) within the status quo. But, is the current model sufficient? Will filling in the blank circles be enough to encourage design thinking or to prepare budding designers for their future careers?

Academia-Industry Collaboration	Corporations	Studios / Firms	Visionaries
classroom and curricula activities	●	●	◐
student and faculty on-site opportunities	●	●	○
short-term intensive design workshops	◐	◐	◐
design competitions	◐	○	○
employment opportunities	●	●	●
corporate-sponsored research projects	●	○	○
professional conferences and community organizations	●	●	●
presenting and publishing new methods and research	●	●	●
grants and philanthropic donations	◐	○	○
advisory boards	●	●	
liaison offices	●	○	○
[● = frequently, ◐ = sometimes, ○ = rarely]			

Figure 1: Industry participation in collaboration initiatives (compiled from various sources)

3. WHAT'S WRONG WITH THE STATUS QUO?

Although these collaboration models have existed for quite some time, several key concerns about the role of design within the shifting organizational landscapes as well as the preparedness of new design graduates still remain, each representing an excellent opportunity for exploration via the academic curriculum or advanced research.

More specifically, while interdisciplinary instruction is touted as standard practice within academia, the opposite sensibility lingers within the industry. Turf wars between marketing, business strategy, engineering, software and design work partners continue to rage (Sampson, 2005) and corporate

leaders, who have begun to question which organization truly owns the user experience, are struggling to find a way to coordinate the individual perspectives (Gribbons et al., 2007).

Worsening the impending identity crisis is the proliferation of new design graduates that design managers often find under-prepared for employment. Most evident are those who seem overwhelmed by the inherent ambiguity and lack of specificity in industry assignments. Design students are not always equipped with the skills to work strategically through this ambiguity. Ultimately, they must learn to articulate requirements and constraints, prioritize opportunities and justify their decisions. Saffer (2007) suggests that the cause is the curricular emphasis placed on design-thinking as opposed to design-making and design-doing. He further articulates, "Doing is the synthesis, presentation, and evaluation of a design; the bridge between thinking and making. . . . For design to be truly useful as a profession and as a discipline, designers can't just use 'design thinking' to come up with strategies and concepts. Some notes on a whiteboard and a pretty concept movie or storyboard pales in comparison to the messy world of prototyping, development, and manufacturing. . . . What we as employers are searching for are people who can do as well as think. This isn't to say that we're looking for glossy stylists either: we want designers who create thoughtful, meaningful designs: designs that pay attention to details, and have emotion and craft in them, as well as reason and cleverness. The world desperately needs those designers."

Beyond creative talent and design execution, many professionals agree that the skills vital to a new graduate's success as a professional designer include the "knowledge and experience to see how design works as a business model" (Eckersley, 2007), the ability to engage subject matter experts, understand international supply chains, leverage production processes, and manage client relationships (Whyte and Bessant, 2007), as well as the faculty to meet deadlines, learn independently, work as a productive team member, and approach projects with enthusiasm, initiative, and eagerness (Kern, 2006). It is this symbiotic relationship between creative design competency, business-relevancy and self-management that strengthens and empowers new designers, often accelerating their career success. As such, design pedagogy must account for this symbiosis.

4. EMERGING TRENDS

As important as addressing the problems in current academic-industry linkages is understanding the emerging trends and connecting research projects and student development to these areas. Those trends which are most relevant to the future of design education include new design philosophies, new user communities, and shifts in the design workforce and environment.

4. 1. EMERGING DESIGN PHILOSOPHIES

Historically, product design has been focused on the aesthetics, form and mechanical functioning of physical objects, or on the creation of usable and visually appealing digital interfaces. However, in recent years, design focus has shifted to holistic experiences which account for not only the usage lifecycle of a product, but the packaging or out-of-box experience and the ecosystem in which the product is used. In this context, the traditional lines between physical and digital interfaces are blurring.

In figure 2, Rettig (2004) succinctly articulates the history of design, as well as projects its future. The design field, in my estimation, is hovering between the "experience: love, learn, work, play" and "connect" arcs. Recently, practitioners and researchers have embraced experience-driven design, and are beginning to define new ways for people to connect with one another.
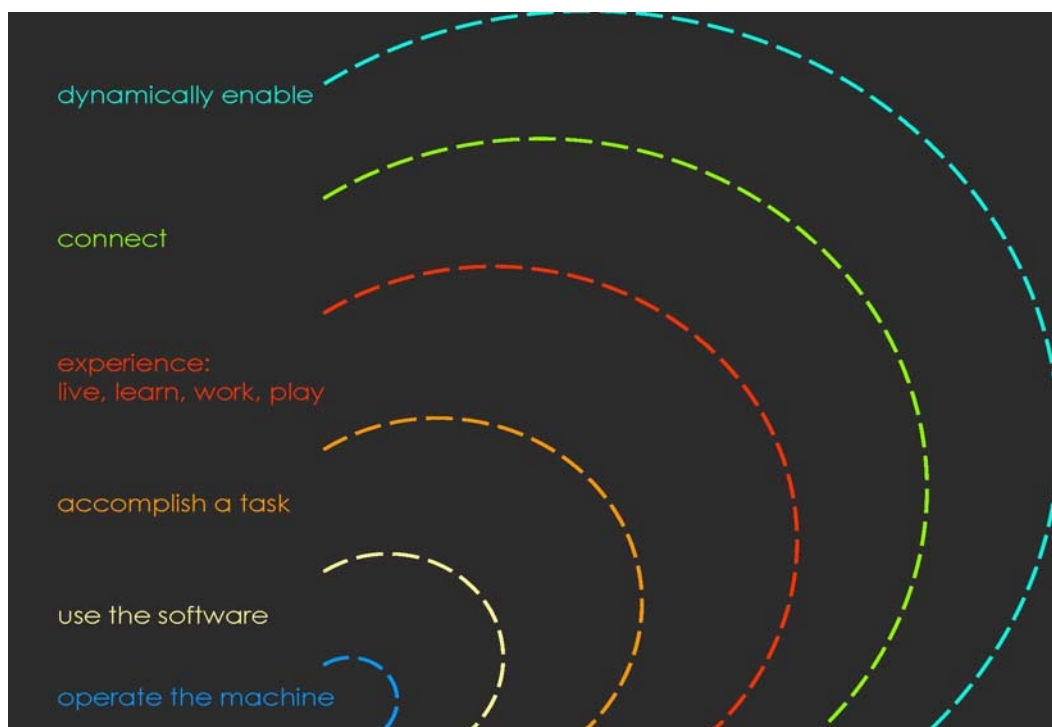

Figure 2: Rettig's (2004) projection of the future of design

As we move into the future, deign will be about dynamically enabling those experiences and connections in a seamless and intuitive manner. This emergence of intelligent ecosystems implies that the boundaries between the physical and the digital will continue to blur and the complexity of a designer's work will increase, thereby raising the criticality of contextual studies, user-centered research and design methods, and interdisciplinary collaboration.

In addition to the increasing dynamism, a renewed emphasis is being placed on the ecological appropriateness of design. In response to the broader realization that global warming is an undeniable threat and that the earth's natural resources are dwindling, consumers are beginning to demand "planet-friendly" design more widely. What was once a controversial movement in the 1960s and a middle-class niche market in the 1980s, has now become an everyday reality for many consumers. Through research, conferences, online communities, published literature and non-profit initiatives, the design community is embracing "greener" methods such as studying biomimicry for inspiration; incorporating recycled, recyclable and non-toxic materials into products; utilizing fewer components and materials; designing for longevity; developing product packaging that can multitask as in-store displays and post-purchase storage; and designing for disassembly, refurbishment and reuse. And, the industry at-large is examining the implications of greener product development and manufacturing processes. (Chochinov, 2007; Papanek, 1984, p248-284; Whitely 1993, p56-93).

Graphic by Rebecca Silver

Distribution
Production
Raw Materials Acquisition
Conceptualization
DESIGNER
Point of Purchase
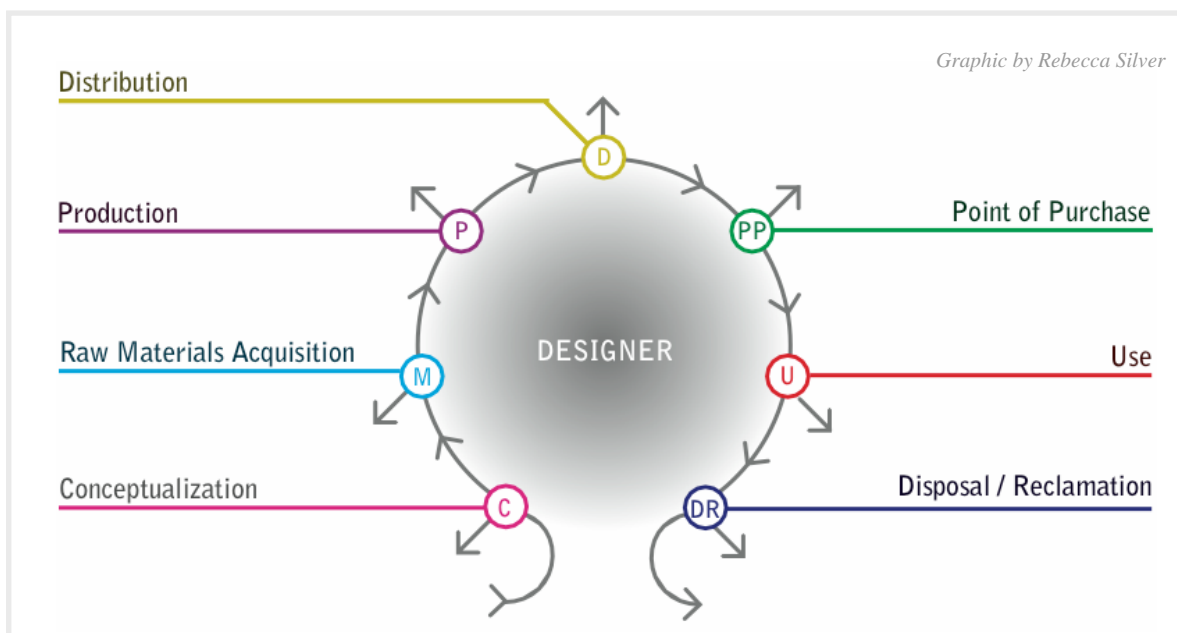Use
Disposal / Reclamation

Figure 3: "Designer's Sphere of Influence", from O2Global Network's Design:Green Handout (2004)

In Figure 3, the O2 Global Network (2004, p8) nicely summarizes the specific parts of the process that a designer can influence through their work. The day will come when "green design" will no longer be a special moniker and sustainable methods at each of these junctures will be inherent to standard design practice.

4. 2. EMERGING USER COMMUNITIES

Globally, new consumer markets are emerging and these users will demand more attention in the years to come. Instead of focusing on the top billion consumers in the world who have resources and disposable income, businesses will turn to traditionally underserved markets like China, India, South America, Russia and Africa. Within these locales, two billion people comprise emerging markets and another four billion are in basic survival mode. And, by the year 2025, experts predict that the earth's population will grow to nearly 8 billion, with the majority of that increase taking place in the regions of Asia, Africa and Latin America (Haub et al., 2006). Because of the sheer size of these communities and the dearth of basic resources they face, the most compelling business opportunities do not lie solely within the ranks of the fledgling middle-classes but in the poorer urban and rural communities. Business strategists like C.K. Prahalad (2006) have begun to realize and promote the business opportunity and moral responsibility of developing products and services for people at the base of the socio-economic pyramid.

Regardless of geographic location or economic status, one trend is consistent worldwide. The earth's population is aging (Engardio, et al., 2005). While the American "baby boomer" generation has received a lot of attention in recent years as they approach retirement age, similar phenomena are occurring on every continent. With decreasing fertility rates and greater life expectancies, the senior population will increase dramatically over the next 25 years. "The trend has drawn the most attention in Europe and in Japan, where the working-age population will decline by 0.6% this year. By 2025 the number of people aged 15 to 64 is projected to dwindle by 10.4% in Spain, 10.7% in Germany, 14.8% in Italy, and 15.7% in Japan. But aging is just as dramatic in such emerging markets as China -- which is expected to have 265 million 65-year-olds by 2020 -- and Russia and Ukraine" (Engardio, et al.). Better health and delayed retirements will amplify the need for specialized products and services in the home as well as the work environment. In addition to meeting the needs of the aging, designers will quickly need to embrace the youth, who are more technology-savvy than their antecedents were. As technology

continues to proliferate, traditional notions of learning, play, entertainment and communication will be challenged. Demand for creative solutions to these challenges will increase.

These three user groups represent great opportunity as well as unique challenges for the design community. It is time now to educate the new generation of designers so that they are well-informed about the qualities and needs of these groups.

4. 3. EMERGING SHIFTS IN DESIGN ORGANIZATIONS

Not only are generational differences in the marketplace critical to the understanding of new business opportunities, but those same distinctions are also present within the design community. Recently, the youth culture (called "Generation Y" in the United States) has received a lot of attention in the media. "Born from 1977 to 1997, they're 70 million strong and are also known as echo boomers because they're the closest in population size to the 75 million baby boomers. . . . Having grown up with the Internet, it's also the first generation that's completely comfortable with technology. . . . This is a generation whose career choices and behavior are driven, first and foremost, by their quest for opportunities to play meaningful roles in work that helps others . . . [They] volunteer in their communities more than any other in American history" (Gogoi, 2005). "For these new 20-something workers, the line between work and home doesn't really exist. They just want to spend their time in meaningful and useful ways, no matter where they are" (Trunk, 2007). This shift in perspective has huge implications on a design firm's recruitment and retention strategies, their flexibility around work location and work-life balance, and ultimately the entire organizational culture.

From an academia-industry collaboration perspective, such generational, geographic and synchronic gaps offer several opportunities for the co-examination of the phenomena and the co-development of new relationships, processes, methodologies and tools to address the inevitable organizational shifts that will take place.

5. NEW APPROACHES TO ACADEMIA-INDUSTRY INTERACTION

By considering the benefits and gaps of existing academia-industry partnerships and through examination of seven trends that will inevitably shape the future of design, new models for

collaboration can be developed. Organized by ownership, the following discussion outlines several opportunities for strengthening the academia-industry interface.

5. 1. FOR THE ACADEMIC COMMUNITY

Bring the real world into the classroom or take the classroom into the real world. Theoretical knowledge like design philosophy, design thinking, methodological approaches and social and ecological responsibility are undeniably core to design education. But, the practice of design in real-world contexts rife with demanding clients, ambiguity, complexity and constraints is equally important. Incorporate real projects with real clients into the curriculum. It is within these settings that students hone their professional skills of observation, organization, prioritization, business justification, and communication. It is here where designers master design thinking, making and doing.

Require international studies. Given the inevitable forces of globalization, worldwide population growth and emerging markets, designers must have international experience. "Modern design education . . . is essentially value-free: Every problem has a purely visual [and formal] solution that exists outside any cultural context…. Until educators find a way to expose their students to a meaningful range of culture, graduates will continue to speak in languages that only their classmates understand" (Beirut, 1997, p214). Academic institutions could mitigate this challenge and offer their students a great service if they required participation in international internships, international research, study-abroad programs, or immersive cultural exchanges before graduation.

Explore new research opportunities. Much of the research in design is centered on new user observation/testing methods, new design processes and new product or service experiences. Given the impending shifts in the workforce, there is great opportunity to research new approaches to creative leadership and management and new methodologies and tools for enabling effective geographically distributed collaborative design activities. (e.g. How can you use technology to facilitate creative-brainstorming when not all participants are in the same room or available at the same time?) The results of such research will not only benefit design practitioners but it can also be applied in a variety of collaborative settings. By connecting designers to designers, students to

students, and designers to students, regardless of their locale or timezone, such solutions provide an infrastructure for future academic-industry collaborations.

Stay Connected To Industry. As mentioned earlier, many design educators currently maintain consultancies or freelance engagements. For fulltime educators, sabbaticals and internships within the industry might be considered. Also, visionary boards, that are designed to engage academic insight into a company's future research and development direction, are equally stimulating and require a smaller time commitment.

Influence other academic communities. While interdepartmental research is an obvious answer, broader and deeper opportunities should be sought. In most academic environments, each department has its own building, hallway, lab or space in which to operate. While dedicated spaces are invaluable resources for the students and professors affiliated with a given department, their geographic positioning is often isolating thereby inhibiting cross-disciplinary communication. (i.e. How often do you see a sociology student hanging out in the engineering department, or a fashion designer in the automotive design studio?) Educational institutions should create physical spaces which allow for, and even encourage, serendipitous exchanges between students from very different disciplines. Libraries, cafes and other socially-oriented spaces are a start, but similar crossroads should be built into buildings dedicated to research and teaching.

Additionally, in many design curricula, students are encouraged or required to take classes in complimentary disciplines like psychology, anthropology, engineering, computer science and business. However, it is rare that those departments require their students to take introductory courses in design. Their basic exposure to design thinking, design methods and designers as valid and valuable components of the product and service development process, would yield powerful results in the industry, minimizing the turf wars prevalent today. This gap represents an opportunity for design educators to engage their peers across the institution in an exchange about the criticality of interdisciplinary education and research.

5. 2. FOR THE INDUSTRY

Offer more of the work opportunities that students and professors seek. While educators and students are encouraged, even expected, to engage with corporations,

none of these efforts can be successful if the internships, apprenticeships, industry sabbaticals and research grants do not exist. With limited commitment, minimal risk and reasonable financial investment, both the company and the participants receive immediate benefit from the relationship.

Build deeper relationships with students. Beyond classroom instruction, there are a variety of opportunities to engage students more deeply. Build a presence on campus through activities such as information sessions, portfolio reviews, interviewing and mentorship. With a small investment, practitioners are able to identify upcoming talent and better understand the needs of this before they enter the workforce. And, if the relationship is particularly meaningful, de facto brand ambassadors on campus will be created in the process.

Redistribute the funding. Examine where the philanthropic funding is going. Many companies are already making an investment in Science, Technology, Engineering, Math (STEM) and Business programs, particularly large corporations. For those organizations, contributions to design-related or design-inclusive initiatives should be considered as well.

5. 3. FOR ACADEMIA & INDUSTRY TOGETHER

Expand the collaboration. While academia and industry alone can make strides, there are certain initiatives which would benefit greatly from the engagement of professional associations, government or non-profit collaborators. Governments already finance a great deal of STEM research globally. One interesting approach might be for educational institutions, corporations and professional associations to collaborate as powerful allies in an initiative to raise government awareness to the importance of design-related research grants and scholarships. Another relevant and timely example would be for an academic institution, a professional firm, and a community development NGO to co-organize a design initiative where students and professionals work together to develop solutions for disenfranchised communities.

Halt the impending identity crisis. Design educators, practitioners and professional associations must work together to clarify the role of design through a shared definition of the various disciplines, a standardized body-of-knowledge for each specific design

discipline, a common articulation of how these design disciplines as well other work partners contribute to the holistic user experience, and possibly certification processes.

Expand the diversity of the design community. Design is very much a multidisciplinary and multicultural field. Within any given academic institution or professional practice, the designers have backgrounds in fields ranging from engineering to the human sciences and they represent cultural heritages and educational philosophies around the world. However, diversity gaps still exist within the design community. In comparison with Western design activities, the number of schools and design-knowledgeable corporations is markedly low in Africa, Latin America and parts of Asia. As discussed earlier, these are precisely the regions where population growth will be concentrated during the next several decades.

In preparation for the upcoming population shift, design firms, academic institutions, governments and NGOs should work together to diversify the pipeline that feeds the design industry. Training non-native designers how to develop culturally relevant solutions by incorporating more ethnographic methods into their process is valuable. But, engaging practitioners of African, Hispanic and Asian descent is even more critical.

An excellent place to start would be to engage teachers, administrators, academic advisors and parents at the elementary and secondary education levels in discussions about design as a viable career direction. Additionally, scholarships and special programming within these communities would have a greater impact. Exposing students from the target communities to design thinking and viable career opportunities early on will positively effect their engagement in the industry in years to come. Within this particular academia-industry collaboration space, participating organizations can find motivation in the social responsibility as well as the business opportunity inherent to this challenge.

Modify academic rewards structures to encourage collaboration. While interdisciplinary collaboration is touted as critical within the design community, it is not always rewarded in academic settings. While not every design program is housed in a standard university system, those that are face the challenges of tenureship and institutional politics. In such environments, individual research contributions, publications, and grant funding are often viewed as greater accomplishments than facilitating creative collaborations. Design firms, professional associations and government institutions must begin to wield their collective influence and funding power in support of interdisciplinary

initiatives. With such systemic support, academic administrators can begin to re-evaluate and redesign the institutional rewards system to encourage collaborative work.

Seek creative synergies. Above, the importance of design educators engaging other academic departments in interdisciplinary collaboration, and the prevalence of corporate-sponsored courses were discussed separately. However, combining these two opportunities would yield synergistic results. With such a model, the corporate-sponsored design courses begin to incorporate interdisciplinary instruction from a mixture of business, industrial design and engineering professors (Page, 2006 and UIC, 2006). By engaging other academic departments and design practitioners with expertise in interaction design, visual communication, information architecture, computer science, materials science, anthropology and/or psychology, interdisciplinary lectures and real-world activities can complement the traditional monodisciplinary instruction. The intensive interdisciplinary studios-of-practice that emerge would significantly increase the degree to which new graduates are prepared for the industry. With the integration of corporate-sponsored interdisciplinary research projects, these studios-of-practice can be further evolved into collaborative centers of innovation, providing thought-space and maybe even physical space for disparate programs to interact and achieve new creative synergies.

6. CONCLUSION

 "At no other time in history have the design professions played such an important role in pressing global issues. . . . The opportunities for business and practice success are as abundant as they are complex" (Cramer, 2006).   As a study of the history and emerging trends within the global design community, this paper serves as a call-to-action for academia and industry to embrace these complexities as well as the subsequent opportunities.

At Motorola, the Consumer Experience Design (CXD) organization currently manages, facilitates or contributes to projects globally which align to each of the eleven academia-industry engagement models. Moving forward, CXD will explore several of the proposed opportunities for deeper and more strategic partnerships, with hopes of sharing the results and lessons learned in future publications. Through such individual efforts and, more importantly, through extensive

collaboration, educators and practitioners can deepen the design thought-space, enhance the educational experience, quicken the knowledge transfer process, raise awareness of design as a powerful discipline and take advantage of the social, environmental and economic opportunities that lie ahead.

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