Can Industrial Design Education Turn the Corner?
Setting a New Trajectory for the Future of Industrial Design Education
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The Problem with ID Education Today - What the Critics Say
Based on reviews of hundreds if not thousands of portfolios submitted by ID students graduating from school across the country, "Famed designer Gadi Amit (NewDealDesign) laments the lackluster quality of job applicants and their portfolios…Despite the recent surge in interest in design careers, the quality of candidates portfolios seems to have stagnated or even diminished…I'm finding the impressive academic credentials of most students don't add up to the basic skills I require in a junior designer"…and "Simply put, the (American) design education system today is failing many aspiring young students."[1]

Don Norman puts it differently but is clearly adamant that the design education system is out of synch with the needs of today's world, "We need new kinds of designers, people who can work across disciplines, who understand human beings, business, and technology and the appropriate means of validating claims. We need a new form of design education, one with more rigor, more science, and more attention to the social and behavioral sciences, to modern technology, and to business."[6]

This criticism is not solely targeted at the US market. As identified in a recent article published in the UK, "BDI (British Design Innovation) chairman Gus Desbarats believes that business expectations of Industrial Design being a broadly-based strategic offer rather than a narrowly-defined "product design" service are ill-matched by the way Industrial Design is taught and practised in the UK" [2] In the article Desbarats goes on to say, "Typical modern Industrial Design skillsets extend beyond traditional object creation skills to include business process modelling, innovation strategy, ethnographic research skills, cognitive behaviour knowledge, customer interaction choreography, brand narrative, proposition development, software design, service system design, graphic design, implementation feasibility, specification and sourcing." [2]

How did we get here? … A quick look at our roots
There is much talk in today's design circles that suggest that design field is going through turbulent times of change. If we turn back the pages of history and revisit the roots of industrial design there may be lessons we can learn, as there seem to be indications that this may be a road we've been down before. Let's take a quick look at the past to retrace the origins of the field of industrial design and perhaps to see if we can identify a few analogies to our own situation today.

Hans Wingler, the author of one of the more comprehensive publications on the Bauhaus [8] traces the prehistory of the Bauhaus by identifying a number of key figures who had foresight to anticipate the emergence of field of industrial design.

Wingler begins his pre-history of the Bauhaus by identifying Gottfried Semper as perhaps the first to recognize "that a disintegration of the crafts traditions would have to be completed before one could hope for a new and substantial attitude toward art." [8] In addition Semper was outspoken in his criticism of the education system of the day in his publication titled Science, Industry and Art in 1852 with his rather brash claim that "Basically, these great academies of art are little more than institutions of the sustenance of professors, whose clique is a long way from recognizing its isolation from society." [7]

Wingler's second reference is to William Morris' letter published in the Arts and Crafts Circular in 1898 where Morris is openly critical of the craftsmen/designers of the day, "I say that, if they had had the due use of their eyes, they would have seen this at once, and then fallen to reason as to why it was so; In which case, they would surely soon have found out that there were abundant reasons against the possibility of imitating the ancient work: the principal one being that since that

time the whole structure of society has altered, and the position of the workman changed; that the long chain of tradition which was unbroken till the end of the middle ages has been snapped." [5]

And my third reference from the Wingler text comes from Walter Gropius himself shortly before the formal establishment of the Bauhaus. " It cannot be denied that a gap exists in the communication between these two groups of vocations - the technological and the artistic – which must be bridged from both sides with reasonable approach and much good will. The businessman or the technician accuses the artist of lack of practical discipline, while the latter accuses the businessman of lack of taste" [4]

Semper recognized that it would require a different approach to art and craft to address the opportunities brought on by industrialization and was openly critical of the inability of the educational system to recognize this change and respond. Morris also recognized the significance of the social change and was vociferous in his condemnation of the inability of the craftsmen/design of the day to recognize the need find new disciplinary approaches to effectively address the opportunities created by this level of disruption. Gropius in turn identified a specific opportunity to build new bridges between the rising businessman/technician and the artist.

This was not just an incremental change in social structure but the beginning of a fundamental shift in the way of life. As we all know, one of the most significant responses to this upheaval (from our perspective as designers and educators) led to the founding of the Bauhaus. And one of the most significant contributions of the Bauhaus was the merger of arts and crafts education centered around the design studio model which for all intents and purposes still forms the basis of by far the majority of design schools in existence today.

Where are we today? …One common curriculum for all schools?
The design studio model moved to the US with the establishment of he New Bauhaus in Chicago in 1937 under the leadership of Laszlo Moholy-Nagy with Walter Gropius as a consultant. The Institute was short lived and closed in 1938 due to lack of industry sponsorship but the model had taken root. Moholy-Nagy, the former director went on to form the School of Design in Chicago in 1939 and one of the faculty members of the New Bauhaus, Hin Bredendieck, relocated to Atlanta to establish the Industrial Design Program in the College of Architecture at Georgia Tech. In a similar fashion, many other ID Programs can trace their roots to similar origins - most often grafted on to an already existing School or College within a large educational environment as happened at Georgia Tech

The most interesting aspect to recognize in this entire transition was the uniformity in program structure from program to program across the country despite the difference in nature of the academic institutions. The Institute of Design in Chicago was the only school established as an independent entity and struck it's own course. Other ID programs were affiliated with a range of related academic units from Art & Design, to Architecture, to Engineering…but surprisingly, by and large the curriculum remained consistent. The design studio model proved to be robust and graduates of these program have helped develop the field of design to the level of prominence we all benefit from today.

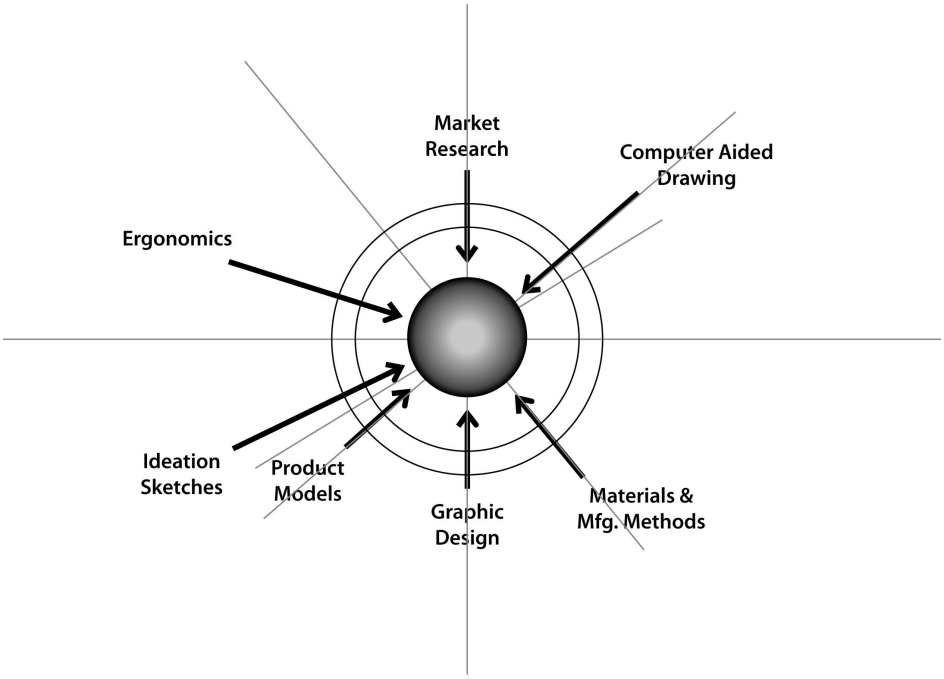
Evolving Demands on the Design Curriculum - Recognizing the Implications of Change
As Semper, Morris and Gropius all recognized in their time…and as Amit, Norman and Desbarats are trying to tell us today…the writing's clearly on wall. The world is changing on many fronts around us and we have an opportunity and obligation to rethink, retool and reinvest in the role of design education for the future.

Changes in the field over the past decade have forced industry to rethink their approach to design to remain competitive in an increasingly complex marketplace while design education has lagged far behind.

One of our colleagues, Ed Dorsa from Virginia Tech addressed aspects of this same issue in his presentation entitled *The Design Education Bottleneck* at last year's IDSA conference. Ed quite rightly positioned design education somewhere between two rocks and a hard place and went on the explain, "The hard place is the increasing complexity and specialization of what we teach. [3]

Industry has already recognized that no one designer can handle the scope of today's "typical" design challenge in the timeframe required. There are new disciplinary requirements. There are demands for a broader-based in-depth understanding of more diverse technical, social and cognitive fields of knowledge…and projects of this scope can only be handled by interdisciplinary collaborative teams.

Product as Artifact: Let's look at the changes we have seen in roughly the past 15 years. Even perhaps as recent as the mid-90's the structure of the design studio model that evolved from the Bauhaus held its ground. The basic goals and objectives of industrial design had remained relatively unchanged – the goals focused on the design of 'products as artifacts' – or as Don Norman likes to say "form and style - pretty things." The basic structure of the studio as the primary vehicle for learning under the tutelage of a "studio master" was still viable particularly if the "studio master" had significant experience in practice. It was logistically feasible and highly efficient to harness one individual's experience to communicate a reasonably competent understanding of the relatively fixed set of skills and knowledge through a set of prescribed design projects – all within the traditional design studio environment. With 3 or 4 years worth of sequential studios it was viable for a student to assimilate a reasonable understanding of the subject matter and demonstrate a facility to apply that skill and knowledge through 'real-world' type projects.

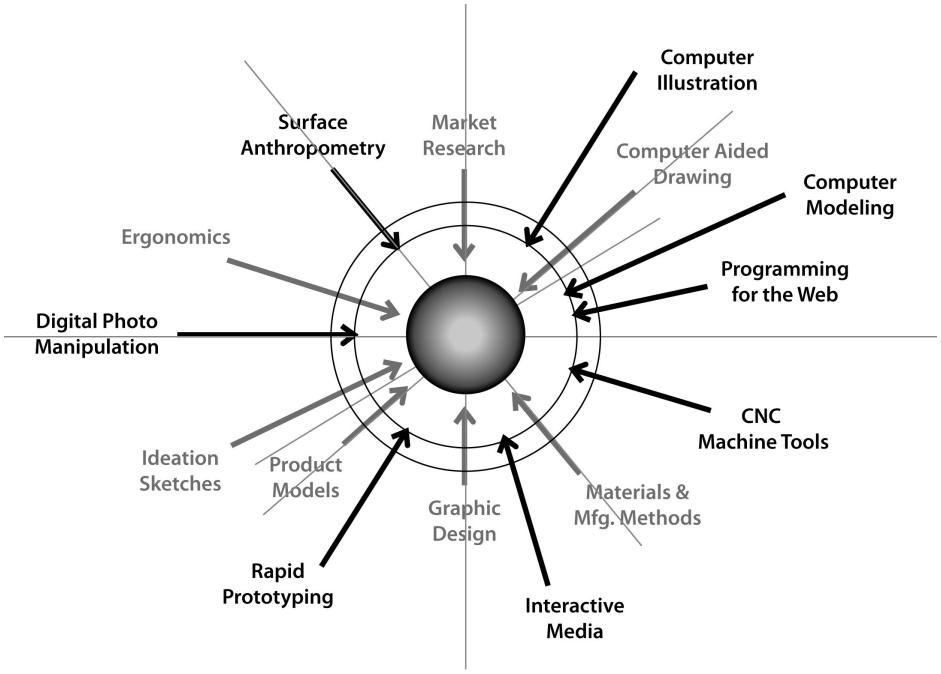


I) Product as Artifact: Before 1995

Introducing Digital Technologies: …but then things began to change…and the significance of those changes began to snowball. The advent of digital technologies together with the introduction of the Internet has had a profound effect on the workplace. Two particular areas of rapid development relate to the development of new CAD tools + new ways of using technologies in response to our growing understanding of the Internet. Some of the more relevant extensions

to our CAD tools included profusion of low cost CNC machine tools, low cost computer modeling, rapid prototyping and the introduction of surface anthropometry – all required advanced knowledge and skill to use effectively. At the same time we were beginning to develop an entirely new set of skills to help us deliver more fluid information via the Internet as well as more intuitive ways to interact with that information as Internet users. These new tools required new skills and knowledge in the areas of digital photo manipulation, programming for the web, information architecture, and interactive media. The diversity of applications for these tools has placed extensive demands on ID education and all design schools have been struggling with how best to handle these new requirements for the past 10 years.

Although, independently, the addition of this new set of tools could be considered an incremental addition to current curriculum, the problem resides in how to incorporate additional content in an already overloaded curriculum and how do we cover the scope of applications in a meaningful, integrated set of 'real world' studio projects to provide a well-structured comprehensive education for our students.

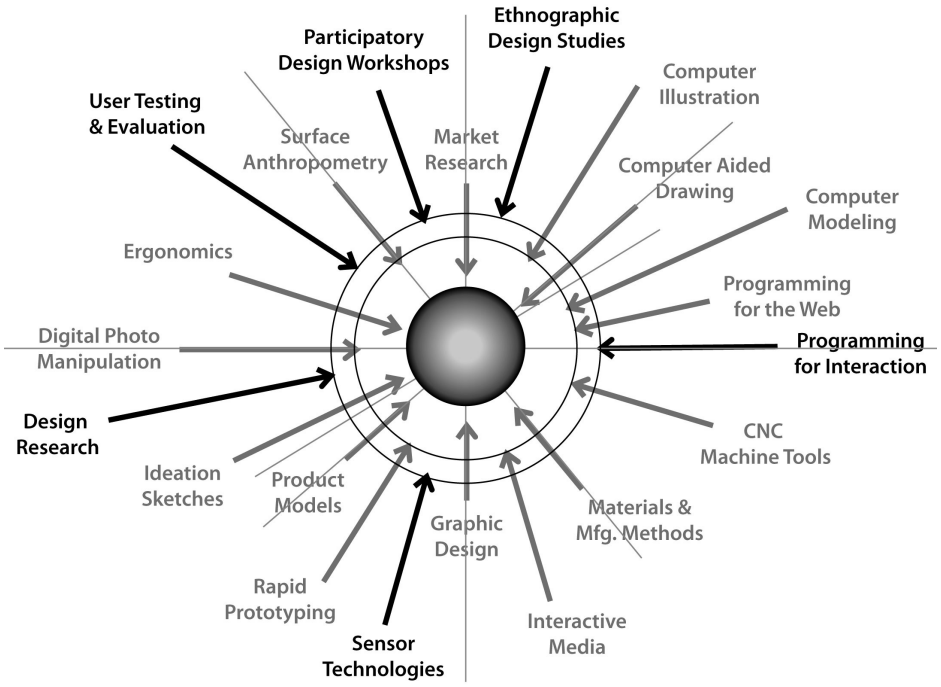


II) Introducing Digital Technologies: 1995-2000

Design for Experience: The real challenge came with the introduction of mobile technologies and the recognition and understanding that the value of design was no longer tied to artifacts but the experience surrounding the artifacts and the role they play in shaping the narrative of life. The emphasis on the relationship of design to the individual and the social implications of digital technologies created new goals, objectives and outcomes for design that changed the entire landscape.

As we began to design and develop new personal mobile technologies we began to realize that the problem was no longer simply tied to utility or for that matter the look and feel of the object. The demands on the design were much more substantive. We had to look long and hard to begin to understand the design requirements and it soon became apparent that design for experience was tied to much more than product as artifact – the artifact was part of a system and more often than not tied to a service. This search led to new design language, new design methods and new ways to communicate design concepts and ideas. In addition it became readily apparent that many of these problems had a much higher level of complexity than we had dealt with in the past and often required the involvement of expertise above and beyond the normal demands placed

on a traditional industrial design consultancy and could only be handled efficiently by an interdisciplinary team of experts.



III) Humanizing Technology - Design for Experience: 2005-2010

Rethinking the Design Curriculum

It should be clear from the three sequential snapshots of changes in the design field (identified above) that the toolbox for designers today has grown dramatically. It should also be obvious that there is no longer any one "Studio Master" capable of teaching the full range of skill and knowledge-based issues that our students now require of a design education. It is also no longer reasonable or feasible to assume that we can effectively teach this entire extensive set of tools to each and every student enrolled in our programs today. We will have to make choices and we will have to make changes.

In the words of Ed Dorsa, "Industrial design is growing more complex by the day as new and important information becomes available and requires inclusion in our curricula…. This confluence has caused an information bottleneck for many design programs. Course curricula are full, a function again of the high contact-hour studio model that we use, and though it is true that when something comes along that radically alters the playing field, like digital technology did 20 years ago, we find a way to fit it in. But this doesn't begin to cover the looming and constantly growing body of knowledge. New facts and emerging methodologies should be, must be, integrated into the graduating designer's education. There just isn't sufficient bandwidth within the present structure to deliver it. [3]

We are all looking for answers but most schools are reluctant to make significant change. Virginia Tech has identified an interesting option they call *'5-week – 1 credit hour Topics Modules'* in an attempt to increase the bandwidth of the studio by adding more shorter studio courses. It would be interesting to hear their results as they continue to test this model but the faculty at Virginia Tech have already acknowledged that this model requires more advanced planning and an increased level of commitment on the part of faculty…and isn't really a viable long term solution. At the other end of the spectrum is the D-School at Stanford that has developed a curriculum that draws on a methodology for innovation that combines creative and analytical approaches, and

requires collaboration across disciplines from engineering and design, with the arts, social sciences, and the business world.

Looking at the evidence, it seems clear that an incremental change to the industrial design program structure and/or curriculum will not solve the impending problem. On the other hand, the D-School's decision to begin with a clean slate 5 years ago appears to have paid off.

So, what are the key elements we need to consider? To begin with, the design field has grown significantly and is beginning to mature. No one program can be all things to all people any longer. As per Gadi Amit's suggestion we need to more clearly define who we are and what we we're good at. An ID program within an Art & Design College should clearly have a different agenda than an ID program with an Engineering School. In addition there are typically logical opportunities to leverage connections to local expertise across campus and/or across town. Perhaps it would make good sense to look at the evolving academic models in other disciplines. Engineering is a close ally and a perhaps one of the better models. Engineering has evolved from a generic discipline to a range of specialties from broad-based programs like civil and mechanical engineering to more specialized divisions like computer engineering and biomedical engineering. How might this model unfold for Industrial Design?

A Strategic Approach to Rebuilding ID at Georgia Tech

Under the formative direction of Hin Bredendieck, the ID Program at Georgia Tech was established as a direct descendent of the teaching and studio model of the New Bauhaus. Over the years the program had grown, was well respected in international circles and had routinely placed well in both the national and international ID School rankings. Within the walls of the Institute, however, the situation was very different. Open criticism of the program had forced the Dean of the College of Architecture into a corner as internal circumstances had reached the boiling point. He was given a choice to either shut down or rejuvenate the ID program. Thanks in great part to the efforts of Michelle Berryman, a former president of IDSA; along with assistance from the IDSA membership, there was a rally of sufficient support to convince the Dean to rebuild the program. At the same time it was clear the gauntlet had been dropped and the challenge was substantive. It would require a significant change to both the structure and curriculum of the program to meet the revised expectations.

Specific Issues of Concern: In many respects the concerns for the Industrial Program at Georgia Tech are similar issues faced by most other Industrial Design Programs.

1. The ID Program at Georgia Tech is one of the smaller academic units on campus. To put it in perspective, the ID Program has roughly 200 students while Engineering has roughly 10,000.
2. The ID program is one of the most expensive programs on campus per capita. This is a direct result of the nature of the studio model and the requirement for individual workspace and extensive workshop facilities. (It is interesting to note that Industrial Design has larger workshop facilities available for students than Engineering)
3. The ID Program operating costs have escalated in recent years dues to the intensive use of computing technologies in support of design activities.
4. The ID program has generated little or no research income to date for the Institute – this is major consideration given that Georgia Tech is ranked as a tier-one research institution and all academic units have a mandate to conduct research.
5. The ID Program has historically operated in isolation from other academic units on campus.
6. The ID program generates little income from alumni and industry sources
7. The ID program has a poor history of securing tenure for faculty.
8. The ID program has a small full-time faculty contingent and a disproportionate number of part time faculty that in turn leads to issues of continuity across the curriculum and limits the ability to 'tune-up' the curriculum.

Rebuilding: As a first step the School of Industrial Design was restructured in the spring of 2010 as a vertically integrated autonomous unit to provide greater continuity between undergraduate and graduate education. This was much more than a simple name change from an ID program to a School and is somewhat of a double-edged sword. We get to control more of our own budget but we are also responsible for carrying our weight within the campus community – both visibly and financially. The School of Industrial Design is now one of 10 Schools on the Georgia Tech campus.

The second step was to strengthen the technical and research orientation of industrial design within the campus community. The key component here was to develop a strategy to strengthen the core curriculum through significant revisions to both the undergraduate and graduate curriculum to establish a more rigorous methodological approach to the design process. The changes will focus on the integration of aesthetic, functional, utilitarian, economic, sustainable, social and cognitive considerations to strengthen the recognition of the designer's role in humanizing links between people and technology.

At the same time we identified the opportunity to develop focused design strengths in curriculum and research in three priority areas by leveraging existing ties to technical strengths across the campus including:

- Health & Well-Being with campus connections to the Center for Assistive Technology & Environmental Access (CATEA) and the Health Systems Institute
- Product Development and Innovation with campus connections to Mechanical Engineering, Biology, and Management)
- Interactive Product Design with campus connections to Interactive Computing and the Graphics Visualization Unit (GVU)

In this way we believe we will be able to foster and build stronger ties and linkages with industry and at the same time leverage cross-disciplinary ties with faculty and student strengths in complementary areas to build research expertise and foster new opportunities for applied research in the three primary areas of technical strength.

What have we been able to accomplish to date

Curriculum Revision: Over the past year we have been begun to restructure the undergraduate curriculum to begin to build focal strengths in the three specialty areas we have identified based on the technical and research strengths of the Georgia Tech campus. The new curriculum structure will enhance the academic rigor of the program by offering structured content in independent lecture-based courses and leveraging the studio as forum for students to focus on integration of skills and knowledge garnered in lecture-based format. Beginning at the Junior Level students will have a choice of a series of ID lecture-based electives along with a choice of theme-based studios that will allow each student to either follow one of our pre-planned specialty tracks or tailor their curriculum to fit their personal goals. To date we have had 14 new courses approved by the Institute and are finalizing the curriculum revisions to roll out the new curriculum in the Fall of 2012.

Visibility and Recognition: Our efforts to build bridges to other academic units across campus have already had significant pay back. We have formalized a 4th year Interdisciplinary Capstone Design Studio with Mechanical Engineering. This section of the 4th year studio is twice as large as our other 4th year studio sections and is co-taught by a faculty member from mechanical engineering and a faculty member from industrial design. In addition our negotiations with Interactive Computing have helped Industrial Design land funding to build a new interactive product design lab to support the design development of new sensor-based products, systems and services. The new Lab is scheduled to open in August 2011.

Facilities and Resources: To support the revised curriculum we have been able to negotiate the consolidation and expansion of all ID studios and offices along with the addition of the new interactive product design lab (identified above). To help alleviate the faculty shortfall we have

approval and are currently conducting a search for two new full-time faculty. We are also actively working to formalize connections to faculty in other units to help consolidate ties in our priority areas of interest for technical and research support.

Research and Industry Collaboration: We have begun to leverage our three areas of specialty to attract and build stronger ties for collaboration with industry in areas ranging from short-term in-class task-type exercises to more significant interdisciplinary sponsored research projects.

What do we hope to achieve and where do we expect to be in the future.
Our goal is to build a highly reputable School of Industrial Design with technical and research strengths in the areas of Health and Well-Being, Product Development and Innovation, and Interactive Product Design.

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