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Tomorrow’s Critical Design Competencies: Building a Course System for 21st Century Designers

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Abstract
As design continues to evolve so does our approach at ID, especially toward our curriculum and the competencies we build in our students. Major institutional changes in 2017–18 prompted an in-depth analysis of and update to our largest graduate program, the Master of Design (MDes). Dean Denis Weil and the ID faculty kept two things in mind as they upgraded the program content: the school’s pioneering 80-year history, and the position design holds in today’s tech-oriented world. Doing so revealed three new competencies to instill in our students and three important challenges we face in teaching those competencies, and today’s MDes course system structure reflects these considerations. After offering a brief background of ID and its roots, we will present our view of the role of design in today’s world. We will then outline the structure of our updated curriculum—which responds to our view of design’s contemporary role—and discuss some of the challenges we face as we build tomorrow’s most critical competencies in our students.
The IIT Institute of Design (ID) has always sought to pioneer the practice and education of design. Understandably, then, the mandate given by the faculty and the administration to the new dean Denis Weil in 2017 was to help lead the school into the next phase of its evolution.

We sought to discern how we might best reweave the strands of the school’s DNA to train and educate designers and design-driven innovators to address the challenges of today and tomorrow. With the school’s history and the traditions inspired by founder by László Moholy-Nagy and later championed by Directors Jay Doblin and Patrick Whitney (among others), to guide us, we articulated the character of and unique role to be played in the coming years by the sole graduate-only design institution in the US.

We found some timely and inspiring lessons in the work of our past directors. Founding ID director László Moholy-Nagy was prescient—he postulated that design can and should help transform society and complex societal systems:

1. “There is design in organization of emotional experiences, in family life, in labor relations, in city planning, in working together as civilized human beings....”

2. “[These are] projects to be seen not in isolation but in relationship with the need of the individual and the community. One cannot simply lift out any subject matter from the complexity of life and try to handle it as an independent unit....”

3. “[The designer] must anchor his special job in the complex whole.”

The New Bauhaus (the name bestowed upon ID at its founding) was to move away from the view that design is merely an applied or commercial art toward defining its unique practice of tying together the arts, technology, and commerce for the betterment of society.

Our second long-term director, Jay Doblin, steered ID away from designing products and point solutions to grounding design interventions in broader human, social, and business contexts. This focus on systems thinking plus design was further strengthened by the arrival of Charles Owen in the 1960s. Methods and systems thinking have remained hallmarks of our school ever since.

Third long-term director Patrick Whitney turned ID into a school exclusively for graduate students. He was of the notion that codified design process skills and practices—now commonly referred to as design thinking—were important professional aptitudes that both traditional designers and non-designers could hone. The human-centered design strand drove us further down the path of emphasizing design’s emerging role in innovation and strategy versus its traditional role in making.

Two important ideas became clear during our analysis. The first was that ID needed to build and expand on its four foundational pathways (integration, systems thinking, methods, and human-centeredness) of education and instruction. The second was ID’s unique, niche role within the global design education ecosystem. This was due to two factors: its organization as

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1 László Moholy-Nagy, Vision in Motion (Chicago, Paul Theobold, 1947), 42.
2 Ibid., 42.
3 Ibid., 42.
an institute (versus a school) of design, and its committed role as a practice pioneer. To affirm and develop this profile, we needed to discover a new frontier. Where, what, and how would design be next? What does the world need from design?

Another set of foundational ideas stemmed from changes we had witnessed in our student body and their motivations — why they pursued graduate study in design, what kind of impact they wanted to have, and which industries they entered upon graduation. We saw a shift from design research roles toward roles focused on social and civic impact. Focusing on the user was no longer sufficient — our alumni were going beyond designing interactions to developing services, interventions, and policies that existed in complex systems and served larger and more diverse populations.

Taking together our historic strengths and the new roles, interests, and needs we saw surfacing among designers, we defined three emerging competencies needed by tomorrow’s designers: the ability to cultivate possibilities, embrace complexity, and drive impactful change.

- **Embracing complexity**: Designers can find ways to visualize and thus simplify the act of framing and communicating complex systems. Learning to create a shared view of the challenge, converge on an approach, and activate a set of interventions allows organizations — public, private, profit, and not for profit alike — to deal with complexity.
- **Cultivating possibilities**: Self-organizing by various actors may lead to powerful new ideas, but they emerge from various perspectives and sets of expertise. Design can help by providing stimuli and facilitating the process of unlocking collective creativity and thinking from stakeholders as a group.
- **Driving impactful change**: Many of today’s complex problems require collective action. Through storytelling and making ideas tangible, design can help engage and motivate stakeholders towards action. Combined with data-driven insights, design can make an evidence-based case for action and policy change.

**A New Curriculum for the New Age of Design**

ID’s terminal MDs degree is our most popular. We have been awarding it since the early 1990s, with nearly 1000 graduates to date. Over the decades, the program has kept pace with — and in several cases forged — the changing field of design, moving beyond a traditional production-oriented curriculum in print, industrial design, photography, and so on, towards a strategy-oriented curriculum focusing on new business development, interactive systems, and user research.\(^4\)

Given the changes the world has seen in the last decades, the shifts we needed to make in our curriculum were significant. As a school primarily focused on developing the practice of design, we found ourselves at a transition point. What we came back to was this: we want to continue to equip, train, and educate graduates who move fluidly between strategic thinking and creative doing, and know the importance of both. So we agreed that our curriculum should evolve toward a focus on critical, emerging, evergreen...
competencies rather than technical skills and processes that might quickly become stale or outdated.

The Challenge of Teaching Competencies

As most mature professionals know, acquiring or achieving competency is more than simply amassing heuristics, patterns, or catalogs of techniques. Competency is the translation of knowledge, aggregation of skills, and integration of practice. This is an important distinction, as many of the competencies required to be effective in design are tacit in nature. But they can be fostered through exposure and experience with solving problems in a design-like way.

For example, a typical competency we aim to teach is the ability to sense when there is no more insight to be found in a given body of research, or at least no more that will substantially change the direction of a design proposal. This requires the ability to be intimately involved with the research as well as the capacity to stand back and take stock in the progress being made. Being able to guide a student towards mastery and proficiency in key competencies like these is critical. Teaching competencies, though, can be difficult, especially given the range of topics within the curriculum and the various skill levels that students bring into play. We see three main challenges: 1) covering both breadth and depth, 2) integrating application and theory, and 3) managing diverse aptitudes and perspectives.

Covering both Breadth and Depth

Traditionally most design programs have been oriented around media or forms of production — print, photography, industrial design, and so on. Students would pick one of these major lines of study and learn the associated technical skills, mastering how to create new solutions using these specific forms. The focus of the learning was understanding the limitations of production while creatively finding opportunities to produce something novel.

Throughout its history, ID has emphasized a holistic approach to solving problems — divisions between forms of production can be limiting. Even when approaching newer fields like interaction design, service design, and experience design, ID has looked to stay close to its core pursuit of understanding a problem and devising multifaceted solutions involving interactive elements, physical elements, service elements, experiential elements, and more.

The rub is that as the field of design matures and expands, and as the problems it attempts to resolve become increasingly complex, the practicality of specialization comes into question. Given how long it takes to learn the most advanced thinking in any field, a student must continually narrow their focus to stay at the forefront. As educators, we are simultaneously experiencing a pull toward the depth needed to lead the field, and a pull toward the breadth required to contend with the interconnectedness inherent in modern-day challenges.

Our curriculum structure has been designed to meet the need for educational breadth and depth. Our courses range from 7 to 14 weeks in length, and many of our longer courses can be taken multiple times, as their projects...
change from term to term. These modalities enable us to schedule courses
on specific, cutting-edge topics — the emergence of data-driven generative
design and the role of the designer in such processes, for example — while
offering courses focused on applying everything the student has learned to
a real-world problem. Students are required to take a range of both types of
courses to balance breadth with depth.

**Integrating Theory with Application**

In most academic pursuits, the further a student progresses the more spe-
cialized and abstract their studies become — the ivory tower looming ever
nearer. Design, by contrast, is an applied field. Most designers and design
students are not interested in theory unless it helps to move an idea into
reality. Designers are action-oriented and want to impact the world directly.

Additionally, designers early on in their studies and careers find that a
naive approach to problems can often result in refreshingly novel solutions.
Naiveté allows designers to more easily challenge assumptions and open
new paths of thinking. Applying what may be referred to as the “magic of
naiveté” requires little study and is easy to master. But as a result, some
designers — particularly those newer to design — only get superficially
engaged with the problem space. This presents its own problem. Without
taking in the rich history of prior thinking around a topic, designers are
limited to their own personal experience. This simplistic approach is increas-
ingly problematic in our field, as the issues design addresses today go far
beyond one person’s experience and instincts.

In the classroom, then, how much time do we spend on understanding
the theory behind a problem space, and how much time do we practice the
application of that theory? For example: how much should a designer know
about the psychology behind social change versus exploring how the mani-
festation of a mobile-based service can inspire social change?

Our curriculum addresses these questions by asking faculty to actively
identify and make explicit the theories and fields that are coming to inform
their courses — thinking such as actor-network theory (ANT) from social sci-
ences or machine learning from computer science, for example. The intent
is to build both theory and application into every course. Each course has
its own unique balance, but asking faculty to focus on the bridge between
theory and practice keeps us from succumbing to the siren call of the latest
technical training, or taking a reductionist and instinctive approach, and
helps our students learn how to build off of existing (or, potentially, new)
theories for their work.

**Managing Diverse Aptitudes and Perspectives**

Given the nature of the MDes, we naturally attract students with varying
levels of prior education and experience. Some students wish to formalize
and update their design education, others feel they are not yet ready to
practice design at the level they wish, or have no prior design education but
want to change the direction of their careers. And we have students who are
looking to globalize their education, building on their experience outside
the US through exposure to US perspectives.
Additionally, our student population is as diverse (perhaps even more so) as the field itself. This means that we have a vast reservoir of experience and culture to tap into. ID regularly welcomes students from more than a dozen countries and cultures with professional experience in fields as diverse as music, engineering, liberal arts, architecture, religion, and philosophy. This is a huge asset in-class and studio work. This rich diversity almost effortlessly broadens conversations and perspectives for everyone.

Even though the composition of our community makes for interesting insights, it can make curriculum delivery difficult. Design, like any creative skill, is not a straight path of laddering ever more sophisticated concepts. Teaching students from different backgrounds, disciplines, perspectives, nationalities, and bodies of experience requires flexibility if we are to achieve effective growth for all.

Again, the revised structure of our curriculum allows us to address this challenge. About three quarters of our courses are electives. This allows each student to customize their educational journey. Every student is assigned a full-time faculty member as an advisor to ensure they are making the most of their time, while also effectively filling in gaps or stretching into new areas as they desire. In addition, we have created a series of bridge courses to help students address more substantial gaps in their education. These entry-level courses do more than teach the latest version of Adobe Creative Suite. They focus on research, writing, data literacy, and other needed foundational skills, allowing students to embrace their elective studies more fully and without being at a disadvantage compared to their peers.

The MDes Program Course System

The mission of the MDes program at ID is to teach students how to address increasingly dynamic and complex challenges with rigor, depth, and imagination. We intend for graduates to produce sharp insights, tangible options, and actionable directives to substantially impact their colleagues and organizations, and the world. Achieving this mission of the MDes degree is a complicated dance of orchestrating educational challenges and experience throughout the student body.

ID courses are roughly organized across three stages of study (see Figure 1): Entry (orientation), Core (base field theory and concept exploration), and Concentration (extensions and applications). Each stage is made up of groupings (modules) of courses that work together and build on one another to deliver the highest educational impact. This modular structure simultaneously ensures students are exposed to a common set of critical topics while providing significant flexibility in how broadly or deeply students may direct their attention.

**Entry Modules**

The modules of courses in the Entry stage are called Foundation and Fundamentals. They help a student fill any gaps they have in their education or practice coming into the school and also orient students to ID’s specific philosophy and culture. Foundation courses focus on training the eye and
the mind to see in designerly ways. Students learn to appreciate elegant solutions within complex challenges and develop the manual and increasingly cognitive skills they need to transform ideas into realities that support evaluation and insight. Fundamentals courses cover basic research and data literacy skills along with orientation courses on what 21st century design is evolving towards: advocacy, interventions, and engagement.

**Core Modules**

The Core modules and their courses are key to developing students’ critical competencies for nearly any type of design practice. They offer students the opportunity to develop the types of competencies they need to contend with today’s design challenges and opportunities: how to channel creativity, tame complexity, or mobilize action, for example. By the end of the MDes program, students are expected to establish competency in each core module.
Core 1. Insight Development
Students gain a solid understanding about the problem context through courses that nurture curiosity, ask for deeper investigation, and foster reflective inquiry. Students learn to articulate critical, constructive points of view. They develop the ability to model the complexities of the problem they are facing, always looking to articulate an actionable understanding of underlying principles and their implications. Most importantly, students’ points of view emerge with integrity and clarity as they learn to carry out robust analysis and construct their arguments.

Core 2. Human Advocacy
Students address the multi-layered, human oriented considerations and contexts inherent to a challenge. Balancing individual concerns with broader social values and implications helps them identify critical considerations, principles, and tradeoffs that may exist within a broader socio-technical context. They do this through applying established theory in human-computer interaction and the social sciences along with identifying consequences of courses of action. In particular, they learn to articulate the paradoxes and tradeoffs that arise in human experience (physical, cognitive, emotional, social, societal, cultural) and how to account for these, while also examining key considerations and possible unintended consequences through the lenses of sustainability, bias, and equity.

Core 3. Prototyping
Students learn to externalize and express ideas in a variety of forms using various media. They learn to use prototyping to inspire reflection and discussion, explore possibilities, and test potential applications in real-world situations. Prototyping courses channel creativity toward a tangible end, which prompts further inquiry on the part of the designer and can serve to inspire others, be they stakeholders or audiences. Students are invited to find the boundaries of the problem to inform hypotheses while exploring a medium—a tangible, designed form, or something intangible like a dataset or a service—to uncover its affordances and strategic opportunities. Novel concepts, provocations, hypotheses, experimental results, narratives and/or questions to consider are just some of the demonstrable outputs of this competency.

Core 4. Systems Thinking
Students break challenges down into more manageable elements and interventions. By developing a fluid understanding of points of interaction and influence within uni-systems and multi-systems—including planned, organic, probabilistic, algorithmic, and organizational systems—they learn to identify desirable future states. Key to this work is identifying leverage points across the systems involved in addition to adaptive strategies and interventions. Students discover how to create the conditions that promote innovation within a system (design for responsiveness) while paying particular attention to how to scale discrete ideas into systemic solutions and interventions.
Core 5. Critique and Assessment
Students discuss and critically examine proposed directions according to what may be possible, plausible, and desirable in a given context. They learn to assess the merits of design proposal(s) and creatively identify alternative options. Central to this competency is the ability to make sense of concerns or insights through reflection and discussion, with an eye towards unintended consequences. Students are challenged to evaluate the principles, rationales, and contexts of their choices, and, in light of these, make decisions and move the work to the next stage of development.

Core 6. Leadership and Mediation
Students catalyze collaborative action among stakeholders and experts at every level and scale of a challenge, and learn to identify change and drive decisions that move initiatives forward at scale and with purpose. They identify collaborative actions and decisions that will move the work toward resilient and inspirational strategies by recognizing the context, latent issues, concerns, and implications of change within a wide range of organizations.

Concentration Modules
In addition to building the critical competencies described above, the MDes degree asks students to build skills for specific types of design practice roles, including design research and insight generation, product-service delivery, organization and innovation strategy construction, and product management. The specific courses in these modules reflect best current practices within each field (Table 1).

As they work toward completing the MDes degree, students are expected to choose courses from up to three concentration modules as a part of their overall plan of study. The concentrations combined with the core competency modules enable students to co-create the most flexible and comprehensive education possible, and that versatility ultimately gives our MDes graduates the tools and abilities they need to practice design in the most strategic and impactful way.

Table 1  The MDes concentration modules within each practice area.

| Practice Areas | Design Research and Insight | Product + Service Delivery | Organization and Innovation Strategy | Product Management |
|----------------|-----------------------------|---------------------------|-------------------------------------|-------------------|
| Concentration Modules | Stakeholder Research | Interaction Design | Systems & Innovation | Enterprise Management |
| Communication and Media | Physical + Digital UX | Civic Systems | | Collaborative Design |
| Data + Design | Physical Design | | | |
| | Service Design | | | |
Degree Outcomes

After dedicating two years of study and practice to the MDes program, we expect and strive to ensure that all students have established three competencies we see as critical. That is, they can: 1) cultivate possibilities that envision a path to an intelligent future; 2) embrace complexity as they seek to understand and articulate the critical contexts and systems surrounding a problem, making sense of it for others, and 3) drive impactful change by successfully moving stakeholders to action.

Also on Our Agenda

The practice of design will continue to evolve. This is exciting, as it reinforces our belief that design competencies are useful in myriad contexts and problems. It becomes a double-edged sword, however, in that the work of delivering graduate design education is never done. There are always opportunities to improve the curriculum so that students are equipped to deliver intelligent and responsible ideas, solutions, and actions. As we continue to refine the MDes experience, we are exploring possibilities in credentialing, universal pedagogy, and continuing education.

Credentialing

Competencies are very hard to assess, even in one-on-one interactions. Students and faculty both struggle with how to demonstrate the knowledge, skills, and experience developed in the short burst of time that a course covers. The final projects students deliver can often seem overly polished, as some students (and faculty) tend to conflate refinement with insightful and critical thinking.

Adding to the challenge, design is not a licensed field with a common set of expected skills. Employers trying to evaluate a recently minted graduate in design cannot rely on universal credentials or metrics. Portfolios allow students to tell a richer story about their abilities through their work, but traditional portfolios still tend to be a collection of final pieces. This does little to expose their underlying abilities — the skills they use to understand, advocate, explore, and address challenges.

Badging is one interesting way to attack this problem of demonstrating a capability has been acquired. By breaking a capacity into smaller, discrete abilities — such as research being broken down into facilitation, data visualization, user interviews, and so on — students can collect a series of small proof points to show the breadth of their competencies. Additionally, leveling up is a goal shared by many mid-career designers when they think about their educational options, so accumulating these discrete credentials, or badges, would also be useful to designers trying to stay up to date with the latest practices in the field. As a school, we are looking to see how we can make progress on this front and help practitioners to not only build, but also demonstrate their abilities in the most effective ways.
Weil and Mayfield: Tomorrow’s Critical Design Competencies

Universal Pedagogy

The debate over the best pedagogical approach continues. Traditional studios, project-based work, and experiential, adaptive, personalized, coached, and reflective approaches—all are ways educators today try to engage students and help them grow. Given the nature of topics we cover, the types of students we engage, and the environments we have to leverage, it is very difficult to standardize a single ID approach shared by all faculty.

While our faculty continue to individually shape their courses, institutionally we believe that the overall environment and format of education is an important component of our pedagogy that greatly influences student outcomes and must continue to be a part of this ongoing evolution. The notion of environment implies everything from the physical space, to the strong community of students and their abilities, to the collaborative tenor of the faculty-student relationship. We place great emphasis on shaping and maintaining this educational environment and supporting our community’s dedication to learning.

In situ practicums (a form of internship) as well as our increasing use of online interactions in the wake of the COVID-19 pandemic promise to drastically improve access to learning. But the effectiveness of these formats in tackling the challenges of building competencies and connecting a student deeply to their peers is unclear. We are in the process of evaluating our options and looking forward to experiments along these lines.

Continuing Education

We have over a decade of experience in teaching non-design executives an appreciation of design through short training sessions. We also engage many design professionals who are eager to stay sharp and build their skills as their roles change. Indeed, many fields talk about the necessity for professionals to be able to continue their education as their respective fields evolve. We agree. We believe that design, in its ascent to a true profession, has room for its participants to come together to continue to build knowledge and practices. Where the role of the university overlaps with this type of professional development is something we at ID are looking forward to exploring and establishing for both designers and non-designers alike.

The Future for ID and Design

The new competencies our students are building and roles that they are filling are crucial to the transformation of societies. To play a strategic, critical role in any type of organization, designers need to be accountable for an enterprise-level outcome. The growing call for purpose-driven organizations creates this opportunity. Today’s curriculum changes position tomorrow’s designers to lead organizations toward their purpose—from its articulation in the boardroom, to its translation into strategic plans and project spaces, to its co-development and implementation within trans-disciplinary teams that reduce the gap between vision and execution. Design is securing its “seat at the table,” and we at ID are fulfilling our role as practice pioneers as we build cooperative, responsible, and intelligent futures—helping lead people and communities to transform society and the economy.

\[5\] For more information on the role of design and designers in purpose-led organizations, see IIT Institute of Design, Lead with Purpose: Design’s Central Role in Realizing Executive Vision (Chicago: IIT Institute of Design, 2020), available at https://id.iit.edu/wp-content/uploads/2020/01/IIT-ID-Pathways-Report-2020.pdf.
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Declaration of Interests

Both authors are currently employed at the IIT Institute of Design (ID) at the Illinois Institute of Technology. Denis Weil is its Dean and Matt Mayfield is Associate Dean of Academics and Administration. The authors declare that there is no conflict of interest with respect to this work.

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