Transforming Universities with Design Thinking

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Abstract

This author asserts that U.S. higher education must greatly accelerate the rate at which it innovates by fundamentally redesigning itself. The paper approaches this subject by first outlining the significant challenges faced by American colleges and universities. It then analyzes the case of a university that is facing these challenges by broadly integrating design thinking into its curriculum and planning processes. The author frames the rationale for pursuing an innovation agenda in this manner and critically presents the results. The case suggests that under certain conditions it is possible for universities to become designable, and when this occurs innovative and integrative change is possible.

Keywords: design thinking, organization design, university innovation

Transforming Universities with Design Thinking

This paper chronicles a university's pursuit of innovation by broadly integrating design thinking into the curriculum and operations.[i] The initiative was motivated in part by the tectonic shifts in U.S. higher education caused by fundamental changes in demographics, the economy, and the competitive environment for universities. The tremors emanating from these challenges have been rattling the foundations of higher education for many years, but they have now grown into a tsunami that quietly surges toward our campuses. The question faced by hundreds of universities is simple: Can these institutions develop life-preserving buoyancy by innovating, or will they become sunken treasures?[ii]

The paper moves through a series of concentric topics, each of which provides a frame for the ideas that follow. Since the design-driven changes under way at Philadelphia University are systemically linked to the broader condition of U.S. higher education, the first conceptual ring begins with a macroscopic perspective on some of the salient challenges faced by universities at this moment in history and calls for urgent change. Moving inward, the second conceptual ring critically examines the position of design thinking at universities as a means of transformational agency. Finally, the central topic focuses on Philadelphia University and the cultural framework that led the University to this point in its evolution. This topic frames the rationale for pursuing a design-driven innovation agenda, explores why particular planning paths have been taken, and examines what has been accomplished along the way.

Philadelphia University's Mother Ship: The U.S. System of Higher Education

Our society, economy, politics, and culture have been dramatically transformed during the past 25 years, driven by a range of factors, including the Internet and computational technologies, a metamorphosis of our economic landscape, significant demographic changes, and a sea change in political sensibilities.

The complexity of this single knot of interwoven transformations far exceeds the knowledge building and disseminating frameworks of any single discipline, and holistically defining and addressing the resulting challenges exceeds the organizational capability of most universities. How has the typical university responded to this extraordinary cluster of interdependent changes? In most cases, it has merely tinkered: an incubator facility to spur innovation here, some interdisciplinary curricula and institutes there, or perhaps words in a mission statement about the importance of educating global citizens. This approach is woefully insufficient to meet the challenges ahead and, as we will see, many others share this appraisal.

In 2005, the U.S. Secretary of Education created a commission to assess postsecondary education in the United States with a particular focus on improving professional education (Ruben, Lewis, & Sandmeyer, 2008). There is much to criticize about the Commission's report, *A Test of Leadership: Charting the Future of Higher Education* (Miller et al., 2006), but one of the foundational findings rings true. The Commission characterizes U.S. higher education as a "mature enterprise":

> *Increasingly risk-averse, at times self-satisfied, and unduly expensive. It is an enterprise that has yet to address the fundamental issues of how academic programs and institutions must be transformed to serve the changing educational needs of a knowledge economy. It has yet to successfully confront the impact of globalization, rapidly evolving technologies, an increasingly diverse and aging*

population, and an evolving marketplace characterized by new needs and new paradigms. (p. xii)

This picture of the academy as lethargic or even moribund has recently been echoed by a number of authors who critique the particular innovation deficits of U.S. higher education, including dated, ineffective, and rigid curricular structures, excessive tuition rates, and a general dearth of innovative leadership (Brown & Adler, 2008; DeMillo, 2011; Kamenetz, 2010). Substantive critiques such as these occur even as the unique economic and demographic conditions that allowed universities to charge higher tuition rates and thus grow their budgets begin to trend in less favorable directions. Simultaneously, for-profit universities with capital markets and venture firms filling their sails erode the value of generic degrees by commoditizing them with low-cost, technology-driven course innovations (Grineski, 2000; Matkin, 2011; Morey, 2004).[iii]

Sleepwalking: Inertia and Path Dependence

These issues are just a few of the challenges that have brought us to a critical crossroads in U.S. higher education. A moment such as this should catalyze the kinds of bold and innovative actions that made our system of universities one of the best in the world, but instead too many of us ritually pace through our routines in the dark like somnambulists chasing a forgotten dream.

The inertial path dependence of American universities is hardly unique (Krücken, 2003; Perellon, 2005), but the pervasive lack of awareness of the implications from inside universities is striking. Leadership in the academy has been unable to correlate a chain of disruptive external changes with the internal organization of universities. DeMillo (2011) succinctly summarized the problem:

> *University leadership in the United States is for the most part unaware that the crossroads is ahead. Few of today's leaders have serious plans in place for choosing a path . . . the obvious question is how so many smart people could miss what seems to be an inevitable crisis.* (p. 25)

DeMillo (2011) had several interesting answers to this question, but for this paper, a satisfactory response is simply that we have lost the ability to envision and frame new possibilities. The higher education community has been unable to develop an integrated, critical awareness of its current challenges and is therefore unable to reframe the meanings of the academy. The current frame has become festooned with the iconography and ornamentation of 19th- and 20th-century institutional ideals and weighted down with normative meanings. We appear unable to reorient the academy toward a newly envisioned future, or to see beyond its borders.

The Academy's Corpus and Its Membrane of Frames

Krücken (2003, p. 327) wrote about the organizational myths at the heart of universities that serve as "boundaries against external influences." We might recast these boundaries positively as a living membrane stretched over a scaffolding system of critical frameworks that grows, dies, and transmutes with the passage of time. The scaffolding is given its basic form by the larger structural members that define the nature and purpose of the academy itself. Its durability is derived from sturdy disciplinary frameworks consisting of theories, protocols, and practices that help domain experts make sense of the knowledge and information that stream through it. Similar to the aggregate added to cement that creates concrete, the extraordinary strength of these frameworks also contributes to the rigidity of the scaffolding itself.

The Design Problem:
Epistemological Orientation of Disciplinary Frameworks

The disciplinary frameworks embedded in the scaffolding are structured by methods of inquiry that typically use two epistemological models to make sense of the world. These models have been primarily *representational*, where "knowledge represents the world as it is" and the "nature of thinking is descriptive and analytic," or *constructivist and narrative*, where "all knowledge arises from what actors think and say about the world" and the "nature of thinking is critical and reflexive" (Romme, 2003, p. 559).[iv]

Our conundrum for innovating is that, relative to induction and deduction, the design mode of thinking is underrepresented in the academy and often confined to liminal curricula and programs. The design mode of thinking is sometimes part of the scaffolding I have described, but administrators and faculty are often unaware of its presence, or wary of its reasoning methods, which can feel disordered and sprawling when compared to induction and deduction, the twin pillars of academic knowledge creation. Even more unfamiliar to much of academia is the powerful epistemological engine of the design process, *abduction,* which Charles Sander Peirce sometimes referred to as "nothing but guessing," words that screech like fingernails on a blackboard to the ears of many academics (Peirce Edition Project, 1998, p. 107).[v]

Design logics have not been part of the normative university's membrane-interface with the broader world, because design practice has not had as its goal validating hypotheses or building the kinds of general, universalizing truths that form the epistemological heart of the academy.[vi] Frank and Meyer (2007) distilled this normative and universalizing orientation of higher education:

> *The core point here—crucial to understanding the extraordinary survival and expansion of the university both in the nineteenth century and currently—is that knowledge refers to a body of universalized principles . . . Even more, the university is positioned to teach both students and society at large the meta-principle that all sorts of particulars can and/or could be understood, and should be understood, as instances of general abstractions.* (p. 294)

This argument extends to the daily practices of individuals, where universalized concepts become the means by which the particulars of human experience are interpreted.

In contrast, the knowledge created by design thinking is generated with particular contexts; it is situational, pragmatic, and directed toward "changing existing situations into preferred ones" (Simon, 1996, p. 111). Designing resists the kind of universalizing knowledge most commonly associated with higher learning, and instead has as its goal situated practice as transformative action. This does not mean that design is without knowledge, but designing does not produce the kinds of knowledge academics have typically recognized and around which they have structured universities. This reality is often confusing inside and outside the academy; for example, when Brown (2009) discussed the centrality of directly and deeply connecting with users during field research, he made the following assertion:

> *We call this "empathy," and it is perhaps the most important distinction between academic thinking and design thinking. We are not trying to generate new knowledge, test a theory, or validate a scientific hypothesis—that's the work of our university colleagues and an indispensable part of our shared intellectual landscape. The mission of design thinking is to translate observations into insights and insights into products and services that improve lives. (p. 49)*

Brown's assertion, I hope, has more to do with the act of finding the subject of design thinking, about which Buchanan (1992) commented:

> *In the process of application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances. This sharply contrasts with the disciplines of science, which are concerned with understanding the principles, laws, rules, or structures that are necessarily embodied in existing subject matters.* (p. 16)

Brown (2009) is correct, but only if we use the normative definitions of knowledge and its creation that dominate in the academy today. While these categories are very important and will remain so, it is crucial for the survival of the academy and the future of our society to enlarge the space in which universities operate to include design knowledge. Only when this enlargement occurs can we adequately provide students with the kinds of agential knowledge and practices required to address the enormously complex political, economic, and environmental challenges in front of us, and only when design knowledge is naturalized within the academy can it fully benefit from the infrastructures of knowledge creation and dissemination and grow beyond its current boundaries to more adequately address these challenges.[vii]

Finally, and central to this paper, only when university leaders (administrators and faculty) frame their institutions as mutable artifacts, "epistemic objects," or "knowledge objects" (Tsoukas, 2009, p. 169) that are "as much defined by what they are not (but will, at some point have become) than by what they are" can the full power of design thinking be brought to bear on their challenges (Knoor, 2001, p. 182).

Background:
Framing the Evolution of Philadelphia University

The University consists of 3,200 students and offers degrees from the bachelor's to the doctoral levels. More than half of the University's undergraduate students graduate with degrees in design disciplines. It began referring to itself as a university only 13 years ago when it shed the name Philadelphia Institute of Textiles and Sciences. Since then, the boundary membrane that defined the University's relationship to the surrounding world grew and shifted shape, but disciplines of practice remained central to its mission as the school pursued what Christensen and Eyring (2011, p. 203) generically labeled "imitative competition." It added programs, degrees, facilities, and services that made the school feel and function more like a comprehensive American research university.[viii]

This tacit model guided the University's sprawling growth as its portfolio of academic programs expanded and the University created an organizational structure more typical of a larger institution. In 2008, the University had grown to six relatively independent schools, with an organizational structure that virtually guaranteed a system of near homeostatic silos with limited curricular interconnections and even fewer incentives to find academic and administrative synergies.

The implicit ideal toward which Philadelphia University organically moved was something like a miniature version of Clark Kerr's (1963, p. 38) comprehensive *multiversity,* where:

> *many parts can be added and subtracted with little effect on the whole . . . It is more a mechanism-a series of processes producing a series of results-held together by administrative rules and powered by money.*

Kerr borrowed a now widely used image of the multiversity from Robert Hutchins, and described the modern university as "a series of separate schools and departments held together by a central heating system" (Kerr, 1963, p. 38).

The University had incorporated DeMillo's (2011) DNA that encoded the "institutional myth" of a comprehensive university and was expressed as a tacit "frame of reference" (Krücken, 2003, p. 328) that guided growth. Gharajedaghi (2011, p. 32) referred to these tacit assumptions as self-reproducing "cultural codings [that] become the social equivalent of biological DNA, those hidden assumptions anchored at the very core of our collective memory."

The University applied this implicit frame: the school tenured many of its faculty and built a beautiful library, residence halls, new academic buildings, and a spectacular student center. This was the period when the name changed to Philadelphia University, suggesting a durable legacy and a relationship with a major American city steeped in national history. To make this connection more explicit, the University even chose to use as its primary identifying mark a calligraphic "P" evoking the city's rich colonial history.

The second view of the future through the primary implicit frame revealed an assumed ideal, but it was too vaguely defined and tacitly understood to reframe. It had become an integral part of the University's culture that drove decision-making about *how* to pursue the goal of a comprehensive university but not *why* this was the right thing to do. Gharajedaghi (2011, pp. 35–37) observed that culture provides "default values" for organizational systems when "actors fail to choose one." The University was indeed a goal-seeking system, where the means to the ends could be chosen, but the end state (a comprehensive university) was fixed.[ix]

The weighty implicit frame of the institution surrounded an impressionistic and inchoate portrait of a larger and more comprehensive future university, yet it had a modest infrastructure to alchemically meld academic units into a gleaming unity. Recall that Kerr's (1963, p. 38) multiversity was "powered by money" and its separate schools and departments were "brought together by a central heating system," whereas Philadelphia University's financial resources were less extravagant and its "central heating system" was always operating at its maximum to bring the warmth of unity to its parts.

Imitation had left the University with a range of quality programs, but they were for the most part similar to the commodities produced by non-profit and for-profit universities throughout the nation. The University, like its hundreds of counterparts throughout the country, could have rolled forward, competing for fewer students, increasing tuition discounts, and generally retrenching, but it chose instead to follow a different path into the future. .

Philadelphia University's Wicked Problem

When you remove the primary interpretive framework from a traditional university, it becomes an overwhelmingly complex place with boundary-defying organizational structures, a sense of belonging to a department but not the university (or vice versa), curricula in solitary Petri dishes or perhaps organically growing into others, overlapping and sometimes ambiguous governance structures, hundreds of budget cost centers, diverse flows of cash, direct instructional activities, auxiliary support services, etc. But apply the primary frame, or "framework of frameworks" (Goffman, 1974, p. 29), with its organizing schemata, and a university coherently appears to all.

To truly transform any institution, those implicit cultural frames must be, to varying degrees, made explicit in order to begin addressing the interesting and complex mess

beyond them. This awareness can produce third-order change that requires members of the organization to have the insight to identify:

> different possible schemata (including a participative schema and a managerial control schema), reflecting on the implications of the various schemata, and negotiating a new shared understanding responsive to the needs of the individuals involved. (Bartunek, 1987, p. 487)

The process of collectively identifying alternative schemata, correlating them with opportunities for transformation, and implementing them can constitute a very *wicked problem.* Buchanan (1992) borrowed the term, which correlates roughly to Martin's (2009, p. 49) description of a "messier problem" embraced by integrative thinkers, "because they know the best answers arise from complexity." Wicked problems are indeterminate, complex, without boundaries, and systemically connected to other wicked problems. They require us to invent a determinant subject from entangled variables embedded in ambiguous contexts by using induction, deduction, and abduction.

A strategic planning process led by a dynamic new president distilled a core set of initiatives engineered from the University's DNA. Understood in strategic terms, these initiatives constituted an elegant system of transformation. However, as a group of nascent, interwoven components dynamically interacting with a particular University environment, the process of further defining and implementing them was a wicked problem indeed.

Designing the College of Design, Engineering, and Commerce

The central initiative of the strategic plan was to create a College of Design, Engineering, and Commerce (C-DEC) by combining three existing schools into two. The implications of the new college were significant, because it would consist of 16 majors encompassing more than half of the University's enrollment. The College would fuse undergraduate, team-based, transdisciplinary professional studies with an integrated general studies component. The goal was to teach students to generate economic and/or social value by innovating in diverse professional contexts over the arc of their careers.[x] The College itself did not originate from the strategic plan working groups; rather, it appeared next to the second initiative on innovation. The president had approximated what Tim Brown (2009, p. 74) referred to as "the top down bit" by attending to the call for innovation, but giving it concrete form as something that could be built.[12]

The College took shape as it crystallized around models and prototypes that the University became more adept at using. Nearly every C-DEC-related initiative was positioned as an opportunity to create knowledge objects to spur learning. The next 18 months could be read as efforts to simultaneously define the College while implementing it in iterative loops of learning by faculty and administrators. The C-DEC cycled between a planned object that required processes and procedures to fully manifest and a dialogical knowledge object from which the University learned. In this sense, the rhythmic movement between planned object and knowledge object was generative for its own future form but, as we will see, also well beyond the boundaries of the initiative itself. This interplay allowed those faculty and administrators involved in building the C-DEC to "re-articulate the proto-interpretations that are already manifested in the epistemic objects and, thus, make new distinctions" (Tsoukas, 2009, p. 169).

For example, after the C-DEC was announced as a goal, but before it took shape as a developed program, a few faculty members described their interpretations of the C-DEC as "find it [design], build it [engineering], sell it [business]" (H. McGowan, personal

communication, November 10, 2011). This understanding applied the "proto-interpretations" (Tsoukas, 2009, p. 169) of the tacit cultural frame that had previously guided the University by privileging conventional knowledge domains and their delineated roles over the possibility of innovation processes driven by true transdisciplinary, generative, team-driven problem finding.

Beliefs such as these are deeply rooted. They are embedded in Goffman's (1974) "framework of frameworks" that orients the culture of social groups:

> *especially insofar as understandings emerge concerning principle classes of schemata, the relations of these classes to one another, and the sum total of forces and agents that these interpretive designs acknowledge to be loose in the world.* (p. 29)

Interactions with knowledge objects can help change deeply embedded ways of understanding the world. The concept of the C-DEC was made concrete in the first months after its announcement with two "discipline-neutral" charrettes about future forms of news content creation and aging in place. The charrettes created knowledge objects that were valuable as non-instrumental methods for modifying entrenched cultural viewpoints, because they did not rely on deductive adherence to the implicit assumptions of existing primary frames. The charrettes encouraged "building to think—rather than discussing, analyzing, or hypothesizing in abstract terms before acting" (Coughlan, Suri, & Canales, 2007, p. 127).

Far more valuable than the design proposals that emerged from this process was the new sense of what the C-DEC could be: an increased ability to envision new possibilities. The charrettes encouraged the process of transcending the paradigm of "find it, build it, sell it" and adopting a more integrative sensibility. In fact, one of the most important results of the charrettes came later, in the form of an interactive diagram that demonstrated common C-DEC academic outcomes by year. This led to the concept of interdepartmental course streams (later referred to as pathways and ecosystems) that could unify and buttress the C-DEC academic core courses across disciplines.

When the strategic plan was first launched the University began a multi-phase *action research* project (Antheil & Spinelli, 2011). The goal was to understand how faculty, administrators and staff perceived the gap between the University's current and ideal states in areas such as short-term versus long-term planning, risk taking versus risk aversion, autocratic planning versus participatory planning, and planned versus ad hoc actions.

Based on this user-centered research, important planning directions were changed; for example, the timing for announcing the organizational structure of the C-DEC was directly related to research indicating that the initiative was in danger of losing momentum, because faculty and staff could not concretely "understand their identity in the new structure" (Antheil & Spinelli, 2011, p. 29). Soon after the announcement, it became clear that the community members actually needed to see their names in a detailed information graphic of the College structure in order to concretely situate themselves. The resulting organization chart was an important prototype, because feedback from the deans and faculty allowed for iterations that directly affected the final organization of the College.

Maintaining the momentum for change and further refining the conceptual foundation of the C-DEC resulted in an early announcement of the new building for the C-DEC in the spring of 2009. The building development process provided a structured prototyping opportunity that involved the entire campus as well as a faculty planning committee. Schematic diagrams, sketches, and models caused a number of tacit assumptions to

surface about what the College would be: for example, how and where courses would be taught, the role of individual academic units, the role of research, how faculty and students would use spaces outside the classrooms, etc. The resulting knowledge was dialogically accrued and iterated, with the architect's prototyping artifacts acting as learning repositories.

The curriculum and building were simultaneously developed, with knowledge from one process sometimes feeding into the other. In a dedicated room in the basement of a dormitory, faculty, deans, and others used sticky notes to visually represent curricular sequences; this produced a series of four core courses with an integrative capstone. These courses were then significantly further developed in multidisciplinary faculty committees chaired by the vice provost as the building emerged from planning discussions. This process continues today.

During this period the curriculum concept emerged of an integrated four-course experience followed by a capstone taken by all 16 C-DEC majors in mixed, team-taught courses starting in the freshman year. The first course is called Design Process and Integrative Thinking. It focuses extensively on team dynamics, opportunity-finding, iterative problem-solving, and basic field observation. In the sophomore year, all students enroll in Business Models, a course focusing broadly on economic and social value creation, and influenced by the canvas approach presented in Osterwalder, Pigneur, and Clark's (2010) book. Junior-level C-DEC students enroll in Research Methods, which introduces ethnographic methods and other basic field research techniques. The final course before the capstone is Science Systems Thinking, with initial options in biomimicry and sustainability. The course introduces students to systems principles, systems dynamics, and their applications. A major capstone project with outside for-profit and nonprofit organizations is designed to integrate the core sequence with the other coursework students have taken in their majors.

The C-DEC core is complemented and extended by interdisciplinary course pathways planned as knowledge ecosystems in areas such as fashion (broadly defined), sustainability and healthcare. The School of Business Administration and the School of Design and Engineering are redesigning their core curricula to leverage and reinforce the C-DEC core.

Beyond C-DEC

The C-DEC development process and the knowledge artifacts it produced proved to be generative beyond the College itself. When a university proceeds down the path of identifying the framing schemata that tacitly drive its culture, the opportunity emerges to position a broad range of change activities as nascent precursors to knowledge objects. Philadelphia University's transformative system of physical components, curricular initiatives, personnel support, and cultural development eventually became embodied in models, diagrams, and other prototypes that collectively led to an unanticipated conclusion: the entire university should ideally be reconfigured into three colleges. This change would generate value for students by creating a structure designed to translate and apply innovations that had been learned from developing the C-DEC, while balancing enrollments across the University. In the spring of 2011, the University became a matrix organization specifically designed to spur inter- and trans-college innovation.

Conclusion

This paper has argued that U.S. higher education has entered a new phase that will require many universities to fundamentally redesign their futures. Normative disciplinary frameworks and the epistemological models supporting them appear insufficient on their

own to drive this level of transformational change. Instead of tinkering with the same general planning subjects that faculty and administrators habitually address due to path dependencies, design knowledge can help build new frameworks for "discovering or inventing a particular subject out of the problems and issues of specific circumstances" (Buchanan, 1992, p. 16). Indeed, the specific case of Philadelphia University suggests that, under certain conditions, it is possible for universities to become designable, and when this occurs, innovative and integrative change is possible.

More analysis is needed to continue exploring why design thinking has been so catalytic at Philadelphia University, and how transferable its innovation processes are to other institutions. To this end, the University is committed to remaining a knowledge object and serving as a resource from which other universities can learn if they too choose to redesign their futures.

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Notes

[i] I use the following definition of *design thinking* in this paper*:* a team-oriented, user-centered process that identifies and addresses innovation opportunities. The process is abductive, iterative and analogic, and relies on iterative cycles of learning structured by multisensory prototyping.

[ii] Throughout this paper, I use the term *university* to generically refer to any four-year undergraduate college or university with both undergraduate and graduate students.

[iii] See also Gibbs (2010, pp. 241–253) for a critical perspective on the relationship between globalization in higher education and curricular commoditization.

[iv] Of course, in practice these two modes of thought co-mingle to varying degrees.

[v] Peirce is not trivializing the importance of abduction; in fact, in the same essay he positions it as an integral stage of inductive reasoning.

[vi] This statement concerns design as practice rather than its elaboration in areas such as design theory and design history.

[vii] I acknowledge, however, that becoming fully integrated into the current and normative academy has its perils, because to do so the breadth of design and its transdisciplinary nature could very well be sacrificed to accommodate a system of domain specializations that the academy is currently organized to administer, staff, fund, evaluate, and plan.

[viii] See Rosen (2011, p. 7), who used the term "Harvard Envy" for this kind of imitative institutional behavior.

[ix] Gharajedaghi (2011, p. 37) explained that a "goal seeking system is one that can respond differently to different events in the same or different environments until it produces a particular outcome (state)."

[x] A more detailed description of the value generation dimensions of the C-DEC are beyond the scope of this paper, but they focused on critical and professional preparation for a fluid, innovation-driven career environment. More information on the C-DEC can be found at: http://www.philau.edu/. The general studies program at the University is currently under comprehensive review to frame new possibilities for liberal learning and its relationship to professional education.