

DESIGN LITERACY, DISCOURSE AND COMMUNITIES OF PRACTICE

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ABSTRACT Presented primarily in the context of graduate education in design, this paper argues that apprentice-master pedagogical models of learning and the development of exclusively tacit knowledge are inadequate resources for preparing the next generation of high level design practitioners or teachers. Today's design context requires more than formal aesthetic or technical skills—it requires the ability to operate critically in an ever-growing information environment, the global economy and within inter- and multi-disciplinary teams. While all three of the just mentioned facets are important, this paper focuses on the information environment through discussion of design literacy, discourse and communities of practice.

No graduate program can cover all of design, successful programs seek to differentiate themselves and they do so with their mission statement and philosophy. It is within this context that programs develop a particular literacy and discourse. This conversation is not only internal, it is increasingly an international conversation with like-minded individuals and programs—some call this a community of practice—and in design there are many such communities. Building a community of practice depends on faculty and student attention to issues and research of concern. How are perspectives and new knowledge shared? Do graduate students read as a way to contextualize and extend their work? Do faculty read in order to stay abreast of changing ideas in their area of interest, bringing relevant information to studio critique and seminar discussion? And if they read and write—what do they read and where are their writings published?

Designers are slow to embrace more scholarly information that requires reading and critical thinking; they are more inclined to viewing. Is this a problem? This paper addresses the following questions. What is design literacy and how does this relate to discourse and community building? How can an existing discourse within a program be identified and examined? How can a particular discourse be supported? Where can designers participate in sharing scholarly information? What peer-reviewed and other scholarly journals are available to assess the state of knowledge building in design. Why is this important? The paper concludes with the ways in which design education and practice is changing.

TACIT AND EXPLICIT KNOWLEDGE

A long tradition of learning by doing permeates design education. It is even possible that students who learn best through practical exercise are initially drawn to the design field. While this is an effective way to learn, it is only one of many ways and it is based on a context of design that is fairly stable. The most natural outcome of this approach is teaching based on a master-apprentice model. The master has exceptional skills that s/he attempts to pass on to the student through demonstration followed by the students' skill imitation with projects that are defined to bring the learning to fruition. Much undergraduate learning with regard to basic skills and visual sensibility are taught in this way through presentation of a model solution or tightly constrained criteria with limited development options. Trial and error and tacit exposure to skill development result in a gradual growth of sensibility. Another dimension of this form of learning is examination of trade magazines as they also provide master models of current

design trends in form making. Assessment of learning is often measured imitatively against what the master would do.

In *The Tacit Dimension*, Michael Polanyi (1966) discusses the basis of knowledge as encompassing aspects that are practical (tacit) and theoretical (explicit). His focus on practical, tacit knowledge reveals the basis of the master-apprentice model in learning. Many trades have been taught in the master-apprentice mode. Polanyi and others (Lave and Wenger, 1991) have given interesting and diverse cases of such learning. Tacit skills are learned through the doing of them, by repetition and fine tuning of performance. These skills resist being made explicit; they reveal an affinity for performance, a felt 'rightness' in execution that is context dependent with many interacting variables. Much undergraduate teaching depends on tacit knowledge. However, some things can be made explicit, i.e., they can be made plain through language, explanation, method, process or identification of recurring or related patterns. Yet even these explicit ideas must be brought into design action and performance. Knowing the theories or principles alone is insufficient; they must be adopted and adapted through performance. They become more abstract guides that assist performance. It is not that tacit elements disappear or are devalued; the context of design becomes more differentiated in that the ideas that can be made abstract and explicit are stated and the ones that rely on tacit sensibility, a kind of physical touch, remain so with both working together. This enhances the designer's performance. Moving from the tacit to what can be explicit is also an indication that a field is moving from its craft origins to a discipline.

Explicit description of design actions as principles, theories and methods sets the stage for another powerful learning strategy—transformation. Here the limitations of imitation are challenged with a complementary increase in creativity and control on the part of the designer, supporting a more open exploration of the design problem or its possible solutions. This is a more analytical and exploratory approach to design that uses analogies, metaphors, critical perspectives, alternative methods and representations to open issues and development with less constraint and more reflection on process. Development of the design in question is heightened, bringing students to reflective practice (Schön, 1983). This is an appropriate strategy in graduate education.

Many would argue that explicit, transformative learning has a place in much earlier education too. Early in the 20th century, John Dewey, a pragmatist and still controversial educational reformer in the United States, made a distinction between apprentice-based and laboratory-based learning (referenced in Shulman, 2004, pgs. 524-525). According to Dewey, apprentice-based learning looked backward to the demonstration and exercise of known 'best practices' that are particular in nature. Laboratory-based learning is transformative

and requires a critical and experimental approach to new practices and ideas; it looks forward to improvement in the well accepted and preferred mode of the research university. Despite the dichotomy set up here by the author or others that sets apprenticeship against transformative (laboratory-like) learning, both are essential and have a role in developing the next generation of designers.

Within tacit learning and its master-apprentice model, there are communities of practice; sometimes very strong communities that center on a particular master. Certain ideas may also form a center around which practitioners gather. Examples can be drawn from design history, the Bauhaus for example; or art history, Futurism or Fluxus for example; or contemporary design process with its user studies, interaction or experience design for example. In all these cases there are some core concepts or processes that give shape to the community and its concerns. Within explicit approaches to design, such communities of practice are even more evident as they tend to publish cases, theories and research in their attempt to develop knowledge and transform its practical extension into design performance.

Locating three key terms

A few terms and their interrelationships need to be sorted out for clarity. Design literacy underpins a discourse that becomes the focus for a community of practice. Design literacy refers to knowing the history, seminal writings and objects, practitioners and current controversies that establish continuity and change in design. This is less about knowing the fleeting fashion of design and more about understanding cultural shifts that push design to re-evaluate and re-think its position. Such literacy is behind the development of a discourse that is an ongoing—internal conversation within a faculty, but increasingly also an international conversation with like-minded individuals, programs and practices. It is this discourse that brings into being, defines and sustains a particular community of practice.

Design literacy depends on the publication and dissemination of ideas through writing, image documentation, museum exhibition, conference and seminar. It looks through time, from the past to the future in its concerns. It provides a panorama in which a particular discourse resides. The discourse relies on the same vehicles just mentioned, but it is a connected set of particular ideas in either media publication or artifact that supports a community of practice—and there are many such communities in design. Some elements of design literacy coalesce to form a linked discourse that is sustained and developed by a community of practice.

It is difficult, maybe impossible, to cover the breadth of design in general. Identifying a discourse of interest provides entry to a community that shares design performance values. The diversity among communities is interesting, there is design management,

design and emotion, design research, creativity, human-computer interaction, design science—to mention only a few. Together they reveal the multifaceted nature of design.

Identifying the existing discourse

A simple, if crude, way to see what is the current discourse in one's education program is to ask students what are the keywords they hear over and over from various faculty in different subjects. Their answers may be surprising. Of course they'll identify the ideosyncracies of some of the more dramatic faculty members, but they will also reveal the repetitions (even if the exact words or the emphasis shifts a bit) that highlight the conceptual threads that pull the program together. This simple exercise can deliver a broad understanding of what is essential in a program and it can reveal useful information about the focus of either undergraduate or graduate programs. It may also be useful to ask faculty for the keywords that identify their particular learning objectives and then see the comparison between student and faculty responses. A more rigorous approach would be to perform a network analysis (Scott, 1991) that delivers a more dimensional view of the themes, their overlaps and the people that interact around them. Such interpersonal networks can be examined based on the quality of reciprocity, intensity and durability in their relationships. People come together based on shared interests and ideas to form a community of practice.

Understanding changes in design practice

Reliance only on the tradition of a master-apprentice learning mode, with its implicit concreteness and stable learning environment, no longer functions very well. The context in which we live and work is more dynamic with unpredictable change, that sometimes occurs quickly on many fronts. For example, technological change continues to alter how we communicate and what we expect from information, environments and products. Business sometimes sees design as a value creation center that requires better overall planning and integration, while end users of products and services become subjects for observation and investigation, or even participants in the design process. These few examples demonstrate the fact that contemporary design work goes beyond form-making and aesthetic decisions to the earliest stages of developing a possibility, addressing a felt need for something that does not yet exist, that could be made better or that could form a core business idea. These ideas stimulate change in design education, the scope it needs to cover and how learning opportunities are delivered.

If we agree that the undergraduate years are best suited to developing tacit skills, particularly in their earliest years, then more explicit knowledge needs to be developed in later years, largely in graduate education. It is these later years that are the focus of this paper. In particular, graduate programs seek to differentiate themselves by developing a particular community of practice, based on ideas that are evolving and subject to research and refinement. No graduate program can cover all of design, it necessarily sets its focus to develop some ideas while it ignores or downplays others. The faculty has their own particular interests, but in a focused graduate program, they share a philosophical underpinning for their educational goals and overlap to some degree in their interests. This promotes development and cohesion in what is a poorly organized, emerging discipline. These shared ideas become a discourse that runs through a graduate experience and colors the work of the students and the expectations of those with whom they'll later work professionally. Some programs become known for their discourse. For example, Cranbrook was known for its post-modern discourse; the Rhode Island School of Design for its semiotic interest and application as well as its attention to process and materiality; the Institute of design, IIT for its interest in planning and the design/business symbiosis; Milan Polytechnic for its interest in sustainability—the list could go on. Today, graduate programs are turning to an interest in design research within professional as well as in research-oriented programs. But research possibilities are expansive in a poorly defined field such as design, so programs focus on a set of carefully defined research interests that match faculty interest and university capability. Program focus also depends on a philosophical position and faculty with shared, but not necessarily identical interests, who are actively engaged in building a discourse that supports a community of practice.

Building a community of practice depends on faculty and student attention to issues and research of concern. This goes beyond what someone does in design practice, to how they think about and express ideas, making them explicit, connecting them to the work of others. The result may be a new perspective, a more complete synthesis of existing work, or new knowledge—all of these outcomes need to be shared. Presumably the faculty in a graduate program is reading to stay abreast of changing ideas in their area of interest; writing and publishing papers on their work as they need to bring new knowledge to studio critique and seminar discussion. Here the graduate faculty diverges from the undergraduate faculty; rather than be design practitioners who demonstrate tacit knowledge and its application in practical performance, they need to be design scholars who are focused on extending the limits of design thinking and performance

in their area of concern.

In 2002, some doctoral students and I decided to try to find out what design faculty members and doctoral students were reading in order to understand the importance of certain ideas and see how widespread their influence was. A broad list of books was posted online with an invitation to a PhD listserv to participate. People were asked to indicate whether they read a particular book, were aware of it or its author, and to add any notable books they thought were missing from the list. The results from this survey were discouraging—it appeared that the respondents read little.

Because of this we were forced to take another approach by contacting known design scholars who read and to ask them to add to our list and annotate selections. The participants in this were an informal community of practice who shared attitudes and perspectives on design scholarship. The outcome of this was a special issue of the journal *Visible Language* titled *An Annotated Design Research Bibliography: by and for the design community* (Chayutsahakij et al, 2002). Edited by doctoral students, it contained 90 books “...selected through two analytical approaches: the essentialness of the book determined through a design community on-line ranking survey and the discipline distribution through keyword analysis (Chayutsahakij, p.109). Besides an overview of process, there were three sections that listed the annotated entries: philosophy and theory of design, principles and methods of design research, and discourse between design theory and practice.

While the first study was based on books, the most recent investigation, presented here, is concerned with journals. If design faculty read and write, what might they read and where can their writing be published?

The process to identify a range of design journals was based on the author's attention to and experience with such journals over several decades. An online search using the keywords ‘design journal’ was undertaken in April 2007. Other online lists of journals from university sources and individual compilers were also consulted (see Designophy, Media Lab, Usernomics in the References). The twenty-nine journals represented in Table 1 demonstrate a range of scholarly interest in Design. Their data, with very few exceptions, covered the categories the author sought to present: journal title, ISSN number, URL, statement of focus (greatly abbreviated) and start date. No claim is made that this list is exhaustive or complete, however the twenty-nine representative journals offer a window on developing research and scholarship in Design. For example, if the start dates for these journals are examined by decade from the 1960s to the present, one notices the following: only 2 journals began in the late 1960s, 1 journal in the late 1970s, 3 journals in the 1980s, 11 journals in the 1990s, and 12 journals so far in the first decade of the twenty-

first century. The trend clearly demonstrates increased optimism regarding the need for and availability of more in depth scholarship in Design—more explicit information to guide design performance as a transformative practice. Another way to understand this is through the average start date spanning forty years with 1967 (the earliest journal) and 2007 (the latest); the average date is 1995, demonstrating how young this effort is.

Journals begin and sometimes disappear in a few years for a number of reasons; they are: unable to find their audience (either authors, readers or both), unable to sustain themselves financially or unable to generally define their mission and capture interest. Not all the new journals will survive despite the best effort of those involved. University libraries largely supply access to these journals and their use is often monitored as universities seek to contain their operating costs. It is doubtful that any of the journals listed make a profit. They exist as a social good to extend scholarship and are sustained by a community of practice. Two journals on the original list (see *Table 1* later discussed) were folded into other journals, largely disappearing no doubt for financial reasons. One, *Information Design Journal*, with a heritage from 1979 and respected by many, became part of *Document Design* when it moved to a new publisher. This demonstrates the fragility of such publications.

BUILDING COMMUNITIES OF PRACTICE

Design is a vital collection of ideas not all of which are compatible. Not only the broad ideas, but their fittingness to a region or locale are important. Which ideas fit the specific faculty, students, institution and professional practice? Identification of core ideas and competencies need not be monolithic or dogmatic, but they need to fit their environment and be shared. Some ideas lean toward social action with an emphasis on respect for people and their cultural forms; some lean toward science with an emphasis on logic, problem and solution, or evaluation; and some lean toward art and aesthetics. The philosophical bases for each of these is different and the values present in their performance lead to different kinds of assessment. One set of ideas is not superior to another—they are simply different. Design has no singular story; it has many stories and perspectives. As argued, these perspectives become a focus for a community of practice and this is particularly important in graduate programs. How does this work?

Literacy is a very broad concept that encompasses everything design might care about. Within this overarching literacy are specific kinds of discourse that might be big and well developed or small and at an early stage of development. The various forms of discourse

Journal Title	ISSN	URL	Focus	Start
Art, Design and Communication in Higher Education	1472 2273X	http://www.ovid.com	Interest in research in arts and media based subjects in educational institutions; fine art practice-based education, theoretical studies of media, cultural studies, art, design history	2003
Artifact*	1749 3463 1749 3471	http://www.tandf.no/artifact	Explores relevant topical themes for design researchers, practising designers, manufacturers to promote transdisciplinary connections	2006
Asia Design Journal	1738 3838	Unknown	Promotes design's ethical responsibility toward human life and society as well as a vision for the future environment	2004
Co-Design*	1571 0882 1745 3755	http://www.tandf.co.uk/journals	Reports new research and scholarship in principles, procedures and techniques relevant to collaboration in design	2005
Computer-Aided Design*	0010 4485	http://www.elsevier.com	Presents research and development in the application of computers to the design process	1969
Design Issues	0747 9360	http://www.mitpressjournals.org	Presents design history, theory, and criticism	1984
The Design Journal*	1460 6965	http://www.ashgate.com	Covers design practice, theory, management and education; encourages discussion between practice and theory	1998
Design Management Review (formerly Design Management Journal)	Unknown	http://www.dmi.org	Explores articles and case studies on design (products, communication, environments) as an essential resource contributing to long-term success and profit	1990

Design Research Quarterly*	1752 8445	http://www.drsg.org/Issues	Focuses on knowledge and its production in the design fields	2006
Design Philosophy Papers	Unknown	http://www.desphilosophy.com	Explores aspects of design as an object of philosophical inquiry in its relation between beings/worlds as they shape each other	2003
Design Studies*	0142 694X	http://www.elsevier.com	Provides an interdisciplinary forum for development and discussion of design activity and experience fundamentals	1980
Document Design	1388 8951 1569 9722	http://www.benjamins.nl	Covers communication studies, electronic/multimedia products, linguistics, and psychology	1999
Ergonomics in Design (formerly Human Factors)	1064 8046	http://www.hfes.org/publications	Reports on usability of products, systems, environments	1998
International Journal of Art & Design Education*	Unknown	http://www.blackwellpublishing.com	Disseminates ideas, research, case studies with attention to social and cultural values that inform education	1997

Note:

* designates peer reviewed

First ISSN is print, second ISSN is electronic version

JOURNAL TITLE	ISSN	URL	FOCUS	START
International Journal of Design*	1991 3761 1994 036X	http://ijdesign.org	All fields of design research; industrial, visual communication, interface, animation, games, architecture, and related fields	2007
International Journal of Design Computing*	1329 7147	http://www.intute.ac.uk	Supports research and technology transfer in design computing through publication of interaction and multimedia	1997
Journal of Computer-Aided Environmental Design and Education	Unknown	http://scholar.lib.vt.edu/ejournals/JCAEDE	Research and teaching in CAD, computer-enhanced instruction and digital technology in design	1995
Journal of Decorative and Propaganda Arts	0888 7314	http://www.jstor.org	Fosters new scholarship for the period 1875 to 1945 in decorative and propaganda arts	1986
Journal of Design History	0952 4649 1741 7279	http://jdh.oxfordjournals.org/	Covers design history (including crafts and applied arts) and studies of visual and material culture	1988
Journal of Design Research*	1748 3050 1569 1551	http://inderscience.com/jdr/	Interdisciplinary, emphasizes human aspects as central issue of design through integrative studies of social sciences and design disciplines	2001
Journal of Visual Culture*	1470 4129 1741 2994	http://vcu.sagepub.com	Promotes research, scholarship, and critical engagement with all forms of visual culture	2002
Journal of Sustainable Product Design*	1367 6679	http://www.cfsd.org.uk/journal/	Covers economic, environmental, ethical, and social issues in product design and development	1997

New Media & Society	1461 4448 1461 7315	http://www.sagepub.com/journals	Draws on interdisciplinary theoretical and empirical research to discuss new media developments	1999
Planning Theory & Practice	1464 9357 1470 000X	http://www.tandf.co.uk/journals	Presents research, review, and analysis regarding spatial planning and public policy	2000
Point Art and Design Research Journal	1360 3477	http://www.point.ac.uk/index.htm	Offers a context for the presentation and discussion of research in art and design	1999
Research Issues in Art Design and Media	1474 2365	http://www.biad.uce.ac.uk/research/rti/riadm	Reflects on research process, particular methods or techniques, new and emerging themes and topics.	2000
Scandinavian Journal of Design History	0906 3447	http://www.designhistory.dk/index.asp	Supports articles on arts and crafts, decorative arts, industrial design, graphic art, interiors, etc.	1991
Visible Language* (formerly Journal of Typographic Research)	0022 2224	http://trex.id.iit.edu/visiblelanguage	Presents interdisciplinary research and scholarship on typography and visual language in digital media and beyond	1967
Working Papers in Art & Design	1466 4917	http://www.herts.ac.uk	Supports practice-based research in art and design	2000

Note:

** designates peer reviewed*

First ISSN is print, second ISSN is electronic version

might be isolated from others, design as art for example; or related to others, user studies and participatory design for example; or overlap another, sustainability and ecological design for example.

A community of practice that provides energy and ideas sustains a discourse. It encompasses programs, faculties and students that represent the teaching and learning of the discourse; practitioners who represent the practical performance of the discourse and who may be former students or current faculty. Faculty and practitioners can both do research that investigates the development and performance of the discourse, sharing their results and critical ideas with others through journal articles that help establish and expand literacy within the discourse, thereby coming full circle.

Why is design discourse and community building important now? As mentioned nearly a decade ago at the First Doctoral Education in Design Conference (Poggenpohl, 1998, p.104), “Not surprisingly, design [information] is invisible, dispersed within other classifications.” Our literature and discourse are scattered; we publish opportunistically in ACM (American Computing Machinery) or IEEE (Institute of Electrical and Electronics Engineers) publications or other journals that are respected, but not quite directly in our field. In this way we add to knowledge broadly, but not necessarily in our own field as the information is hidden and not attributed to design in any direct way. The design journals with longer history cited in Table 1 are interdisciplinary—covering many design sub-disciplines and even disciplines somewhat aligned but tangential to design. When scholarly design information or research is not actively or broadly sought after by students, faculty or practitioners, a broad publishing agenda is a survival strategy. This is where building discourse and communities of practice with their underpinning literature intersect. It is such communities of practice that will create a mature design discipline and support more focused journals.

In October of 2007, the university where I teach (Hong Kong Polytechnic) requested all schools to submit a list of important high quality journals that support the various subject areas and discourse present in research and taught programs (table 1 is the author’s list not the more extensive list prepared for the university). Identification of these journals and the grading of them according to their quality support the formal research assessment exercise that determines allocation of research money and support for research students. The sciences, engineering and social sciences can easily prepare such a list based on well developed and easily accessible citation indices. This is more problematic for design as it has no citation index; design lacks much of the typical infrastructure that other disciplines take for granted. While design has been something of an outlier on university campuses, this request for a journal list is a clear indication that some universities are trying to bring design into a tighter and more

accountable relationship with the university and that design's agenda must go beyond teaching to research and the development of new knowledge in design.

11	AUSTRALIA	1	HONG KONG	4	PORTUGAL
1	BELGIUM	3	INDIA	1	SINGAPORE
1	BRAZIL	2	ITALY	4	SWEDEN
2	CANADA	1	JAPAN	3	TAIWAN
3	DENMARK	1	MEXICO	6	TURKEY
2	FINLAND	2	NETHERLANDS	29	UNITED KINGDOM
5	GERMANY	3	NEW ZEALAND	11	UNITED STATES
		2	NORWAY		

Table 2 Distribution of PhD design programs worldwide

Both design practice and education are changing. A look at the growth of PhD programs indicates that design research is now more present within universities worldwide. Table 2 is taken from a recent PhD listserv (see Melles, 2007). Here are ninety-eight programs across the world and more in the planning stages. You may be surprised to see emerging nations such as Brazil, India, Mexico and Turkey on the list. From an economic perspective, many emerging countries understand the connection between design and economic development. To this we can add the pressure from universities that encourage design programs to engage in knowledge building and to conform to the university mission to openly create and disseminate new knowledge, such as previously mentioned at Hong Kong Polytechnic University. In this way design is invited to take its place among other more established disciplines that balance professional preparation with knowledge generation. Design practice itself is becoming ever more multidisciplinary due to technological developments and the need for human-centered advocates with broad skills in synthesis. Crossing disciplinary boundaries requires explicit knowledge regarding what is known, how it is known, what constitutes evidence for what is stated and how other disciplines can accept or refute such information. Designers need an epistemological understanding of their own field and those of others with significantly different bases of knowledge in order to effectively interact and collaborate on multidisciplinary teams. As argued, this goes beyond tacit knowledge

but does not negate it.

Changes in design practice and education challenge the status quo and call for both explicit and tacit knowledge. The following six principles, taken from Lee Shulman, president of The Carnegie Foundation for the Advancement of Teaching, identifies “authentic and enduring learning” (2004, pp. 493-494, author italic additions):

The subject matter to be learned is generative, essential and pivotal to the discipline or inter-discipline under study, and can yield new understandings and/or serve as the basis for *future learning* of content, processes and dispositions.

*

The learner is an *active agent* in the process, not passive, an audience, a client or a collector. Learning becomes more active through *experimentation and inquiry*, as well as through *writing, dialogue and questioning*.

*

The learner not only behaves and thinks, but can ‘*go meta*’—that is, can reflectively turn around on his/her own thought and action and analyze how and why their thinking achieved certain ends or failed to achieve others....

*

There is *collaboration* among learners.
They can work together in ways that
scaffold and support each other's
learning, and in ways that supplement
each other's knowledge....

*

Teachers and students share a *passion* for the material, are emotionally committed to the ideas, processes and activities and see the work as connected to present and future goals.



The process of activity, reflection and collaboration are supported, legitimated and nurtured within a *community* or culture that values such experiences and creates many opportunities for them to occur and be accomplished with success and pleasure....

*

These more general principles for learning support the argument offered here that learning prepares one for the future and its uncertainties through experimentation and inquiry born of explicit learning that may be sharable through critical writing, visual reflection and the development of a literature. The active teacher or student can reflectively analyze (meta-cognize) their performance as a way to learn. Social learning, both formally and informally in a community of practice, support collaboration and pursues design knowledge and performance with passion. Graduate programs in design need to stake out their territories for development through building a particular literacy, discourse and community of practice.

The implication for this argument in favor of design literacy, discourse and communities of practice goes even further. For example, languages that are used only orally, that lack a writing system, are likely to disappear. Robust languages have not only a writing system, but also typographic development and extensive creative use. They continue to change and develop—they live. Likewise, design's limited explication of itself is cause for concern. It's infrastructural shortcomings put it at risk as other disciplines discover its methods of thinking and development and perhaps presume to poach on its intellectual and creative territory. Design learning and performance encompass border-crossing activities—between tacit and explicit, logic and intuition, artfulness and science, technology and human behavior, business and the social good. As such it is hard to pin down and this has prevented an easy or clear classification or reference. We have a serious stake in developing design literacy, discourse and communities of practice now.

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